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# Communications of the Association for Information Systems

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## Extending the Vision of Distance Education to Learning via Virtually Being There and Beyond

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### Abstract:

Our vision of distance learning—*learning via virtually being there*—challenges educators and technology designers to go beyond the dominant distance education vision of *learning via structured isolation*. Our vision builds on the best of the technology-enhanced classroom and distance education. Interactions among participants are not only asynchronous but also synchronous, not only one-to-one and one-to-many but also few-to-many and many-to-many, not only about academics but also about the person, and not only consisting of written words but also voice and video. Learning materials and activities are prepared in advance and spontaneously, scheduled and unscheduled, and text-based as well as based on sound and images. Our belief is that most learners benefit from “being there” in a class and that “virtually being there” should provide that same benefit. Important features of our vision that are currently challenging to realize are related to technology limits on sharing all participants’ video, audio, and screens. These and other limitations, which may be beyond our ability to recognize at the moment, will be overcome when visionary educators and technology designers collaborate to develop solutions that fully engage participants in learning and take us beyond what has been envisioned to date.

**Keywords:** learning via virtually being there (LVBT, VBT), learning via structured isolation (LSI, SI), information systems education, future, envisioning requirements, online course, online teaching, online class, distance learning, traditional classroom, correspondence course, mail-order, blended learning, technology-enhanced learning, presence, student–teacher interaction, student–student interaction, desktop videoconferencing, course design, object-oriented business system development

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### I. INTRODUCTION

Most writing on distance learning (e.g., see Dykman and Davis 2008a, 2008b, 2008c; Arbaugh and Benbunan–Fich 2007; and Meissonier et al. 2006), including blended learning and technology-enhanced learning (e.g., see Klein et al. 2006 and Sitzmann et al. 2006), is dominated by a vision of extending education through the use of technology, but it fails to inspire us to reach beyond our current technology limits. This approach has resulted in most distance learning efforts settling for a vision of learning that we describe as *learning via structured isolation*. Although distance education has allowed more flexibility regarding when and where students engage in learning, its implementation based on this limited vision has also moved education backward through loss of the benefits of “being there” in the traditional classroom environment.

Our purpose is to challenge educators and technology designers to help realize and even go beyond their current visions to create a richer and bolder vision for distance, as well as classroom, learning: *learning via virtually being there*. This vision goes beyond today’s compromise in distance education which conforms to current technology limitations. At the same time, this vision goes beyond limitations in the traditional classroom environment to take advantage of envisioned or yet-to-be imagined possibilities for engagement enabled by technology, whether currently feasible or not. Our vision calls for combining the strengths of both traditional classroom and distance learning while not settling for either of their limitations, including perceived technology limitations. We envision the creation of new learning environments which take us beyond both current classroom and distance-learning approaches.

To more fully explain our vision of *learning via virtually being there* and how it differs from *learning via structured isolation*, we begin by discussing a course that one of us has taught face-to-face but is preparing to teach online. Extracting from this example and the literature, we identify key elements of these contrasting visions of distance education. As we will illustrate, the elements of *learning via the traditional classroom* are situated between these two visions. We then explain why we believe our vision is worthy of adoption. We follow that with challenges we have encountered in seeking to find tools that will support the realization of our vision. We conclude by suggesting where the future will hopefully take us.

### II. CONTEXT

One of us currently teaches an undergraduate course in which students learn fundamental object-oriented business system development concepts through introductory lectures and problem-based exercises in a face-to-face computer lab. The lab computers are connected to the Internet and network drives that make it possible for students to access and store files related to the exercises. Students also complete assignments outside of class.

A typical class session consists of an introductory lecture on concepts with examples. Accompanying the lecture is a set of assigned readings (some in a textbook) and notes on PowerPoint slides, which are accessible online. The lecture is followed by an in-class exercise that requires the students to use the learned concepts to develop a solution to a problem using specialized software on the lab computers. The in-class exercise is accessible online, and files for the exercises, including solutions, are accessible from a network drive. The lecture notes, exercises, and files needed for the exercises are prepared in advance. During the in-class exercises, some of the students will talk with each other, asking questions, discussing problems, and looking at each other’s screens. The professor teaching this class will wander about the class, looking at student screens, asking questions of individual students, answering questions that individual students raise, and making comments to the class as a whole. Sometimes unplanned explanations are needed, and text or diagrams may be written spontaneously on a board for all to see. Sometimes discussions may be about material from prior classes or things unrelated to the class.

Experience with the lecture material and in-class exercises for each class session suggests that most, although not all, students need and want the structured discipline of attending a specified time period in which they learn concepts via the lecture and complete associated in-class exercises. Otherwise, they do not keep up, get lost, and drop out or fail. Thus, the plan for a distance version of this class includes specifying a time for each class session so that the students and faculty interact synchronously, helping to maintain the faculty–student and student–student interactions described above. It also includes using the prepared materials and facilitating completion of the in-class exercises with the specialized software on the participants’ computers. Admittedly, needing to have specialized software and the ability to view student screens as they use that software to complete exercises will not apply to all

distance learning classrooms; nevertheless, the other aspects of our context (e.g., students learning from other students) should apply.

For students who cannot attend a specific online class session or who want assistance outside of class sessions, the distance learning version of this class will have the same materials as the traditional class available online. It would be valuable also to have videos of the lectures available. The technology should support student–student interactions outside of class sessions. In-class exercises not completed during class will have a completion deadline that allows flexibility but imposes a limit. This flexibility should accommodate the mature, self-disciplined student who cannot or chooses not to attend one or more synchronous class sessions.

For assistance by faculty outside class sessions, virtual office hours will also be maintained. The plan includes not only asynchronous interaction, such as e-mail, but also synchronous interaction. This interaction will include not only text-based messages, but also full audio and video with screen sharing.

The structured units of instruction—presentation of the concepts by the instructor with assigned readings, lecture notes, and associated exercises prepared in advance—that are part of the requirements for the distance-learning version of this course are consistent with the description of distance learning by Dykman and Davis (2008a, 2008b, and 2008c). This structure and other requirements above are also consistent with lessons presented in other research on online learning (Arbaugh and Benbunan–Fich 2007; Wong 2007; Klein et al. 2006; Sitzmann et al. 2006; Evans and Haase 2001; and Webster and Hackley 1997). The availability of materials online for students to review on their own and the exercises and assignments that students complete at their own pace, within the broader constraints of the schedule imposed by exercise and assignment due dates, provide learner control. Such control is consistent with Sitzman et al.’s (2006) conclusion from their meta-analysis that designing courses with greater learner control of the content, sequence, or pace of material results in greater learning.

The synchronous class sessions, in conjunction with units of instruction structured as small chunks of learning activities that students are expected to complete by specific due dates, address potential problems of falling behind and dropping out. They also provide opportunities for interactions that address the need for additional explanation by allowing not only planned but also unplanned interaction through which the faculty can introduce new material spontaneously.

For distance learning consistent with our vision of *learning via virtually being there*, the technology should be robust enough to support interaction to build a community of learners rather than isolated individuals. Technology that allows participants to see and hear each other should build such a community more readily than technology that does not include both video and audio or limits interaction to text-based exchanges. In our context, the technology should also include the specialized software needed to complete exercises and assignments. It should also facilitate screen sharing as students discuss the exercises and assignments.

The requirements for the distance-learning version of this traditional face-to-face class should avoid limitations inherent in the vision of *learning via structured isolation* while being consistent with our vision of *learning via virtually being there*. We describe the specific elements of each vision next. Following that, we summarize the elements of these contrasting visions in Figure 1, while also comparing them with the traditional classroom.

### III. VISION OF LEARNING VIA STRUCTURED ISOLATION

Key elements of the vision dominating today’s distance learning approaches are the following:

1. Interactions between students and faculty and between students are typically:
  - a. asynchronous/delayed
  - b. impersonal and task (academically) focused
  - c. one-to-one or one-to-many
  - d. limited to exchanges of written words
2. Learning occurs through students independently reading course materials and completing activities related to those, typically posting responses to questions from the instructor and postings of other students. Materials and activities assigned by the instructor are typically:
  - a. prepared well before they are assigned (perhaps even prior to the start of the course)
  - b. scheduled for students to learn, use, and complete in structured units of time, e.g., a week
  - c. text-based

Distance learning typically involves online courses conducted over the Internet with limited, if any, face-to-face meetings (e.g., see the description of the “full distance learning” setting in the study by Messinier et al. 2006).

Exchanges between students and faculty are typically one-to-one, e.g., through submitted assignments and feedback on those via e-mail or an online course management system. The lack of face-to-face meetings and the academic, task-focused interactions illustrate the isolated, impersonal nature of the interactions in these distance learning settings.

Faculty typically prepare materials well in advance, even before the course starts, and structure the course into scheduled, e.g., weekly, modules or units of activities. These activities focus on learning through having students read assigned materials and post responses to assigned questions from the instructor. Students are also typically expected to post responses to the postings of other students. These threaded discussions are analogous to in-class discussions in a traditional face-to-face classroom. Faculty are expected to provide feedback on the postings. Indeed, Dykman and Davis (2008a, p. 283) refer to the “online classroom” consisting of these regularly scheduled, asynchronous, task-focused, impersonal discussions that are limited to exchanges of written words, including faculty feedback, as “the heart of the online teaching process.” Although students appreciate the flexibility of these asynchronous interactions, our experience is that students find this approach significantly less enjoyable than engaging in the dialog that accompanies traditional face-to-face interactions. Today’s distance learning environments too often leave students feeling like isolated outside observers/participants who are not fully present in the learning experience. This structured isolation is reminiscent of older mail-order courses.

Note that the prepared materials in the traditional classroom in our context are similar to those in a typical distance learning context, but the interactions when students are working on exercises differ significantly. In our traditional classroom student–student and student–faculty interactions are part of the free flow of the problem-solving process that basically continues uninterrupted as a student attempts to complete an exercise. They may include multiple questions, answers, or comments between students or between student and faculty, and they occur immediately. In the typical asynchronous distance learning context, students working on exercises could post intermediate solutions (e.g., screen images), ask questions, and wait for responses from other students or faculty. It is likely that responses would not be immediate. After receiving one or more responses, the student could post an additional question. Additional time would pass. The problem solving process would proceed in interrupted fragments separated by potentially significant amounts of time. Given the passage of time, the student may need to take time to review the problem and prior steps taken to complete the exercise before understanding a response, beginning to determine if it helps, and deciding what to do next.

In the typical distance learning context, considerable efficiencies can be gained once the materials and activities for a course are prepared. They may be loaded into an online course management system. The materials and activities can be reused not only by the original faculty but also by others. They are also available to students at any time and place where they have Internet access.

Students are presumed to be independent, self-motivated learners who will persist at completing assigned activities (e.g., see Wong 2007). The prepared materials, together with the schedule of assigned activities that have regular and frequent due dates, are all intended to facilitate learning and persistence. The detailed preparation and scheduling of materials and assignments by the faculty is unlike a traditional course where the faculty may not be an advanced planner or may prefer to be more free-flowing and adapt to the unique character of a classroom. Such faculty may prefer to identify and develop materials and assignments along the way and spontaneously discuss materials or topics not planned well in advance.

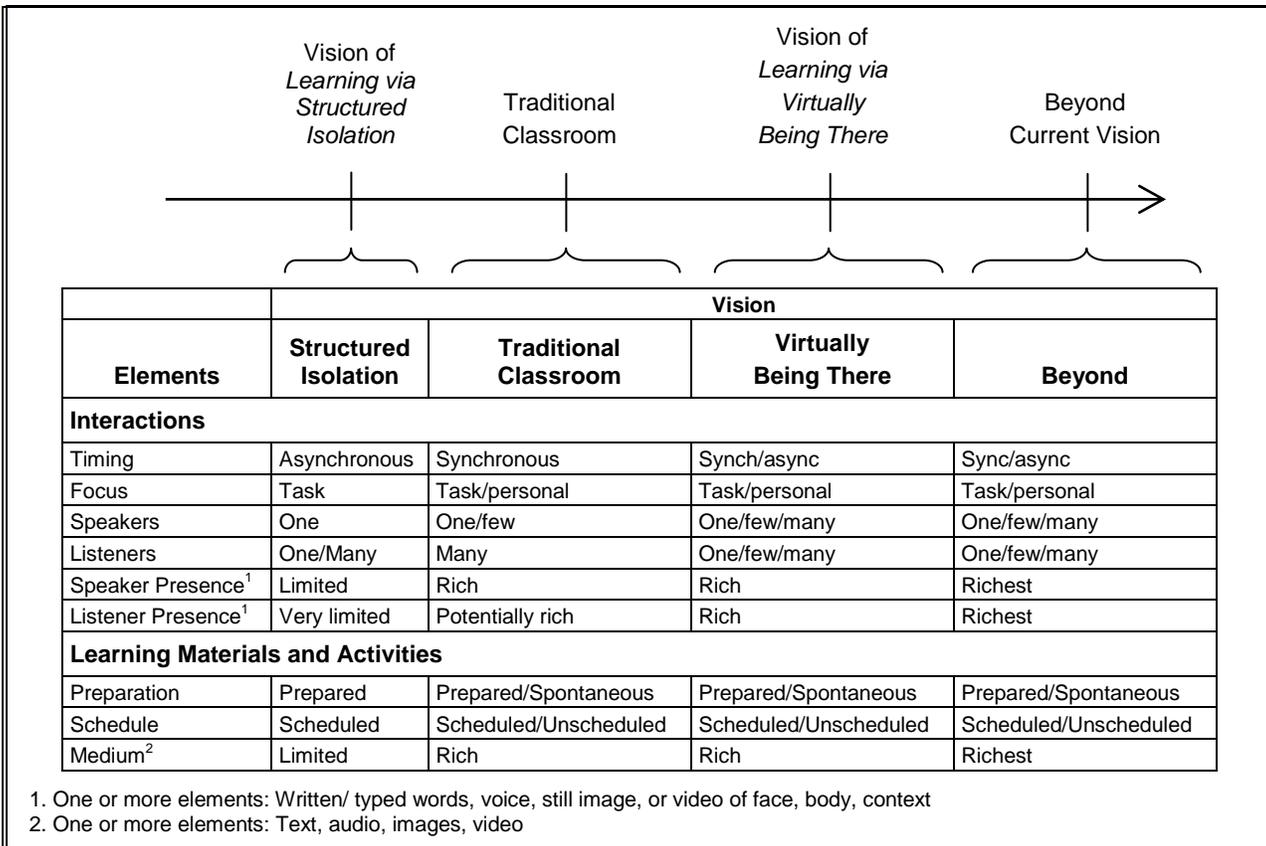
Besides one-to-one interactions between faculty and students described above, interactions are one-to-many broadcasts via e-mail or web pages developed by faculty via entry of materials and activities into the course management system for display to all students. Interactions between students are typically one-to-many interactions involving one student’s posted response in a threaded discussion that makes the response visible to all other students. Unlike interactions in a traditional classroom, where a student may ask faculty to clarify an assignment and other students hear the response or a student may ask another student what the faculty meant, such interactions are not as natural in an asynchronous class. Furthermore, the inability to see and hear each other and the full context in which all participants are immersed, such as facial expressions, intonation, movements, and setting, makes natural interactions and the engagement that comes from that less likely. The benefits of personal as well as group presence have been lost.

Other possibilities beyond the typical elements described above may occur in distance learning settings. For example, Internet (i.e., voice-over-IP) telephoning makes it possible for interactions to go beyond the exchange of written words, and desktop videoconferencing makes it possible to see and hear at least the speaker, whether faculty, a student, or a guest. Furthermore, besides focusing on the impersonal, academic task, many students and educators recognize that education, whether in a distance or traditional setting “is also about socialization, maturation, personal development, and becoming good and useful citizens in society” (Dykman and Davis 2008c, p. 13).

#### IV. VISION OF LEARNING VIA VIRTUALLY BEING THERE

Other possibilities beyond those in the vision of *learning via structured isolation* are at the core of our alternative vision. These possibilities are based on both students and the faculty being able to interact not only asynchronously but also synchronously while seeing and hearing each other in a natural, fully engaged manner. Being together and being fully engaged, whether in or out of the classroom, extends the way that learning occurs. It extends the range of interactions between students and faculty and between students beyond one-to-one and one-to-many. More specifically, key elements of this vision are the following:

1. Interactions between students and faculty and between students are typically similar to those in a traditional face-to-face classroom and the associated out-of-classroom interactions, e.g., in the hallway, faculty office, library, team rooms, eating places, or residences:
  - a. synchronous/immediate and asynchronous/delayed
  - b. personal and task (academically) focused
  - c. one-to-one, one-to-many, few-to-few, few-to-many, and many-to-many
  - d. exchanges that involve seeing and hearing each other in real-time as well as exchanges of written words
2. Learning occurs not only through students independently reading course materials and completing activities related to those, such as threaded discussions, but also through a variety of synchronous and asynchronous activities during and outside real-time classroom sessions that are similar to those associated with actually being there in a physically co-located learning situation. Materials and activities may be:
  - a. prepared before they are assigned (perhaps even prior to the start of the course), but faculty may also adjust as they go through the course
  - b. scheduled for students to learn, use, and complete in structured units of time (e.g., a week), but they may also be more spontaneously assigned, used, and completed during a synchronous class session
  - c. text-based, but also sound- and image-based.



**Figure 1: Alternative Visions of Distance Education**

The two alternative visions of distance education described above are represented in Figure 1. In addition, we list a number of elements and dimensions that differentiate these visions. Toward the left end would be an asynchronous distance education environment that has a package of prepared, text-based self-study materials that the student completes according to a specified schedule with little, if any, interaction with other students or faculty. The addition of synchronous voice interactions (e.g., via Skype 2009 using voice-over-IP telephone) to distance learning, such as

for faculty to discuss issues one-to-one with students or for students to discuss issues one-to-one or in small groups, would move the vision from the left toward the right. The addition of synchronous voice and video interactions, e.g., via desktop videoconferencing, such as Adobe (2009) Acrobat Connect Pro or Elluminate (2009), would bring together students and faculty in a synchronous virtual classroom. The speaker, whether faculty or student, would be heard and seen by all others at once, thereby moving the vision farther toward the right.

In general, our vision of *learning via virtually being there* involves a mix of both ends or multiple categories of the various dimensions that differentiate the visions. Classes based on our vision need to build richly on the best of traditional classroom and distance education. Although today's blended learning classes come closer to our vision than either the traditional classroom or the typical distance learning class, faculty and technologists with visions anchored in today's technology still settle too easily for its perceived limitations when designing a blended learning experience. Blended learning refers to the use of distance learning in conjunction with face-to-face classroom instruction (Gribbins et al. 2007; Klein et al. 2006; and Sitzmann et al. 2006). Distance education classes that combine the use of desktop videoconferencing software for synchronous interactions with units of instruction involving structured discussion may be considered examples of blended learning, but faculty who readily adapt distance education classes to today's technology limitations do so at the expense of limiting the richness of interaction that students could experience in a traditional classroom. In our vision of distance education, technology would make it possible for participants to experience the voice, image, movement, spatial orientation, and other aspects of synchronous interaction that make us wholly present with each other. Although most desktop videoconferencing software that we have investigated supports seeing the instructor or speaker and may allow video of more than one participant at the same time, it does not currently allow all participants in larger size classes to experience audio- and video-based interaction naturally. Nevertheless, it does support the realization of a vision that is toward the right half of Figure 1.

At the far right of Figure 1, we recognize that visions beyond ours will emerge. Indeed, we encourage others to develop even bolder visions of what may be. Suggestive of these visions is the current Second Life (2009) virtual world. It presents an interesting animated approach to enhancing the visitor's sense of "presence." Having a rich sense of presence is an important element of any future learning environment. We expect that additional elements that we do not currently recognize will help differentiate these yet-to-be-specified, expanded visions. Such visions will require visionaries to break the bonds of current historically limiting experiences and perceived technology limitations.

## V. WHY OUR VISION?

Our vision is based on leveraging the best of traditional and distance education. The traditional classroom allows interactions in which participants can see and hear each other and react instantaneously. The engagement of multiple senses, the immediacy of the stimuli, extemporaneous discussion of academic topics, and the opportunity to engage in spontaneous conversations that may be both personal and academic are all features of the traditional classroom that enrich the learning experience. Faculty who wish to adjust as they go through the course may readily do so. These features are part of our vision of *learning via virtually being there*. In addition, an essential feature of distance education that enriches the learning experience, viz., the preparation of structured units of instruction with materials and activities that engage students, is also part of our vision. Implicit in this vision is that students are fully engaged by the interactions and the learning materials and activities.

Our belief is that most learners benefit from the features of being in a class and that being in a virtual classroom can provide that same benefit. They also benefit from having a structure that includes prepared materials and learning activities with expected due dates. When the student is *learning via structured isolation*, the structured materials and learning activities must stand on their own and the student must be self-motivated and persistent. When the student is *learning via virtually being there*, the structured materials and learning activities may be further elaborated and the student may be more enmeshed in a community of learners. We believe that moving from the left end of Figure 1 toward the right provides increasing benefits as the best features of the technology enriched classroom and distance learning are realized.

The interactions in a class guided by the vision of *learning via structured isolation* may attempt to provide a diversity of perspectives through threaded discussions. However, interactions in a class guided by a vision of *learning via virtually being there* and beyond should also include a fuller range of visual and aural cues, opportunities for greater clarification, richer inclusion of personal as well as academic topics, and greater immediacy. Even though Sitzman et al. (2006) reported that the level of human interaction did not affect learning between web-based and classroom instruction, they suggested that synchronous communication facilitates learning more than asynchronous communication in web-based instruction. We believe that the richer interactions in *learning via virtually being there* will yield greater learning than the interactions in *learning via structured isolation* and that further research is needed to clarify the underlying processes.

Some may ask whether the benefits of classroom interactions can be achieved in a distance learning environment by an appropriate course redesign. Course design literature (e.g., Levine et al. 2008; Whetten 2007; and Fink 2003) certainly provides useful guidance to faculty considering converting a course from a traditional classroom, where the students and faculty are physically co-located, to a distance learning environment where they are not. Thinking through the learning objectives and selecting the course activities that encourage students to be actively engaged to achieve those objectives may lead to effective substitutes for interactions in the traditional classroom. However, if faculty select substitute activities because the technology does not support interactions that faculty believe would better achieve the learning objectives, compromise occurs. The choice of activities conforms to current technology limitations. Students are losing the benefits of “being there.” Our educated guess is that this compromise occurs in many, if not most, current distance learning course offerings. Media richness theory (Kahai and Cooper 2003; Daft and Lengel 1986) suggests that media with fewer cues, such as media without visual imagery and audio, which is inherent in many distance learning environments, is not as effective as media that include more cues, such as the media inherent in traditional classrooms, which have more naturally occurring interactions. In our context, for example, we believe that the interactions of students, including looking at and discussing each other’s solutions to exercises as they develop them, are more likely to lead to effective learning than substitute activities, such as having asynchronous threaded discussions of final or intermediate solutions. We suspect that the redesign of many traditional courses for distance learning has conformed to technology limitations and yielded less effective achievement of learning objectives. This conformance and standardization also fails to recognize the diversity of optimal learning styles among students.

Others have developed frameworks, concepts, or technology enriched theories of learning that provide a basis for explaining or conducting research that explains how the elements of our vision facilitate student learning and persistence (e.g., see Arbaugh and Benbunan-Fich 2007; Alavi and Leidner 2001; Piccoli et al 2001; and Barr and Tagg 1995). To illustrate, Arbaugh and Benbunan-Fich (2007) specify a typology of online environments based on two dimensions of knowledge construction (no: objectivist vs. yes: constructivist) and group collaboration (no: individual vs. yes: group). The objectivist–individual environment is consistent with the vision of *learning via structured isolation* where modules of learning materials are prepared by the instructor for the student to read and complete assignments individually by answering questions based on reading those materials. To illustrate further, Gribbins et al. (2007) ask questions about three dimensions that may be used to describe different technology-enhanced classes:

1. communication medium type: How does the technology represent or distribute content to students (e.g., as written text, as audio, as still images, or as video)?
2. social presence: What level of interaction and spontaneity does the technology provide students and the instructor?
3. time flexibility: Does the technology give students some control over the timing of the learning process?

A technology-enhanced class where the communication medium is rich with text, sound, and visual imagery (including the voice and video resulting from seeing and hearing other students and the faculty), where students and faculty can interact in both structured and spontaneous fashion with each other, and where students have known times that will involve those interactions and other times that will allow the students to determine what they will do is consistent with a vision of *learning via virtually being there* and being fully engaged.

We do not suggest that others should adopt our vision of learning based on a body of convincing empirical evidence. However, the literature, as briefly referenced above, is suggestive. In addition, for those interested in adding to that literature, there is an opportunity to build on the work of others, such as those already cited, by conducting original critical research. Such research is needed even while we extend our vision of what we want the future of technology enriched learning to be.

Our vision encompasses the best of the traditional classroom enhanced by technology and current distance learning environments. It also should inspire us to go beyond current best practice to develop solutions to traditional educational problems, from the mundane to the more sophisticated. These solutions could include:

1. Automating class attendance
2. Monitoring/controlling student access to diversions during classes (e-mailing, text messaging, web surfing, etc.)
3. Providing real-time instructor alerts concerning students (missing homework, failing homework/exams, student attention, etc.) such that the instructor can address the need for student help or intervention
4. Facilitating student participation, e.g., via computer guided question asking/ answering with evenly distributed instructor prompts for the next question to students with low engagement
5. Encouraging real-time student feedback, such as anonymous progress feedback via student polling, e.g., by clickers, cell phones, or feedback tools built into desktop videoconferencing software (Scornavacca et al. 2009; Clark 2005)

6. Building an environment that stimulates more student senses (e.g., hearing and vision through sound, images, and motion) and personal interests (e.g., development and socialization through activities that are not only academic or task focused but also more personal and social)
7. Stimulating active student involvement, e.g., via case simulations or role playing in realistic gaming virtualizations

The level of effort required by faculty and students to use technology to realize the vision of learning *via virtually being there* and beyond should be minimal when the human interfaces are designed to be more intuitive. Educators and technology designers should work together to develop the technology to make the effort to use it negligible. Ideally, the use of the technology will occur naturally. Of course, faculty will need to continue to think through course design to fully engage students and students will need to expend the effort to be fully engaged. However, these efforts by faculty and students should be part of any course, whether it is in a traditional classroom or a distance learning setting. Ideally, technology will naturally facilitate student engagement in either setting.

## VI. CHALLENGES

Our investigation of technology to support the distance learning requirements specified for the course described earlier and others that would have similar requirements indicates that some elements of our vision are currently realizable, but others are currently beyond our reach. Course management systems support asynchronous interactions using prepared learning materials and scheduled assignments. Desktop videoconferencing systems support synchronous interactions using prepared or spontaneous materials and activities. Besides ubiquitous desktop computing technology that supports text processing and preparation of presentations, audio and video recording technology make it possible for faculty and students to prepare materials with voice, images, and movement. The resulting recordings may be posted in a course management system or made otherwise accessible for use in asynchronous or synchronous activities. More challenging elements to be realized are related to current technology limits on simultaneous video and audio with interactions beyond one-to-many. Even more challenging is screen sharing beyond one-to-many. Given the desire to have several class members interacting (i.e., many-to-many interactions) or simultaneous interactions between small groups of students as they work on exercises (i.e., several many-to-many interactions), it is important to move beyond one-to-many interactions where only one speaker, typically the instructor, is seen and heard by others in the class. The state-of-the-art in desktop videoconferencing technology limits the number of simultaneous participants who can be heard and seen, limits the ease of moving between public and private conversations that have video and audio capabilities, and limits the number of screens that can be shared simultaneously. All current solutions fall short of delivering the personal and spatial presence that we believe is important.

These limitations can be overcome currently to some extent, but the cost of overcoming them is greater complexity in managing interactions, less flexibility in the interactions, and less than natural engagement in learning activities or use of learning materials. For example, participants can be assigned to “breakout rooms” or initiate private conversations in some software. That allows smaller groups of participants to interact. With a small enough group, all participants in the private conversation may be able to hear and see each other. Participants in a breakout room are isolated from other participants while in the breakout room. Someone has to manage moving between the full set of participants and the breakout room. Screen sharing within a private conversation or breakout room is limited to one participant’s screen being shared at a time.

These limitations will be overcome when visionary educators and technology designers collaborate to develop solutions that make participants’ interactions and their use of materials and engagement in learning activities more natural. For example, video and audio that follow the speaker without participants having to take any steps other than speaking to allow the speaker to be seen and heard, such as clicking on a “speak” button or activating a video as required in some current technology, is a “natural” technology solution. As another example, consider thumbnail videos of all participants in a distance learning class. Students normally sit in the same location in a physical classroom. A default display of student video images in the same relative position each time participants enter the virtual classroom, without participants having to take any steps other than enter the classroom, would provide a “natural” setting for spatial orientation and the interactions to occur. Consider one more example. In a class a few students may be actively engaged in the class discussion, while the majority “many” are listening and watching. Support for this few-to-many learning activity may be easier to design technically than support for a many-to-many learning activity. Educators and technology designers guided by a vision of *learning via virtually being there* (and beyond) are more likely to work together to develop solutions that address these limitations than those anchored in the state-of-the-art for distance learning represented in the vision of *learning via structured isolation*.

## VII. CONCLUSION

We have presented a vision of distance learning that challenges the current dominant vision of *learning via structured isolation*. We envision distance learning on a continuum with the current vision on one end where participants

do not interact with each other synchronously. They do not see and hear each other as though they are in a classroom at the same time. Our vision of *learning via virtually being there*, including the expectation that participants are fully engaged, extends the vision toward the other end of the continuum while recognizing that additional visions beyond ours will emerge in the future. In our vision participants interact not only asynchronously but also synchronously. Participants seeing and hearing each other while using learning materials and engaged in learning activities as though they are physically in the same location are essential elements of this distance learning vision. Table 1 summarizes these elements.

**Table 1. Goals and Essential Elements of Our Vision of *Learning via Virtually Being There***

| <b>Goals</b>                             |   |
|--|---|
| Course/Environment Design                | Include the best of distance learning and traditional classroom to fully engage students. Focus on what is best for the student, not perceived current technology capabilities. |
| Technology Design                        | Educators insist that technology designers eliminate perceived technology limitations. Develop intuitive, natural human interfaces for both educators and students.             |
| Location                                 | Participants need not be co-located, but they should have a real sense that they are.   |
| <b>Interactions</b>                      |   |
| Timing                                   | At least some interactions will be synchronous/immediate; others may be asynchronous/delayed.   |
| Focus                                    | Many interactions will be focused on learning (academics), but others will be personal.   |
| Speakers                                 | A student–student or student–faculty interaction may have one, few, or many active speakers.  |
| Listeners                                | A student–student or student–faculty interaction may have one, few, or many active listeners.   |
| Speaker Presence                         | In an interaction a speaker will be fully present (e.g., full video, audio, etc.), as though co-located.  |
| Listener Presence                        | In an interaction a listener will be fully present (e.g., full video, audio, etc.), as though co-located.   |
| <b>Learning Materials and Activities</b> |   |
| Preparation                              | Some materials and activities will be prepared in advance, others more spontaneously.   |
| Schedule                                 | Some learning activities will be scheduled by faculty in advance; some may be specified in class.   |
| Medium                                   | Materials used may include the full range of possibilities, e.g., text, audio, images, and video.   |

Although technological challenges must still be overcome, we are close to realizing the vision of *learning via virtually being there*. More specifically, the current limitation that prevents all participants in an interactive class session from seeing and hearing each other must be overcome. Although current technology is limiting, we suggest that the vision of educators and technology developers is also limiting, particularly if that vision does not include the natural interaction and use of materials while engaged in learning activities as envisioned in *learning via virtually being there*. Evolving technology, speeded by designers focused on facilitating more natural capabilities, will overcome this challenge in the near future. More challenging to overcome in the near future is the ability to wander naturally about a virtual classroom, view student work (e.g., screens), easily move between talking with different students separately, and readily switch from interacting with individual students to engaging the entire class. Similarly, allowing students to move smoothly from working on their own to viewing each others' work and having conversations with each other is also likely to be more distant but still a reachable goal.

Arbaugh (2005, p. 136) notes that “student expectations for overall quality of online instruction are rising quickly and dramatically.” We believe those expectations will soon include the ability to interact as though in the same physical location. Technology is evolving rapidly toward supporting such interaction, but for faculty to adopt the technology, it must be natural to use rather than too complex or difficult. Working together, both educators and technology designers should work toward extending the vision of distance learning beyond *learning via structured isolation* to a vision of *learning via virtually being there* and beyond. The future of education can be what we want it to be, not just what the constraints of technology appear to impose on us.



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*Editor's Note:* The following reference list contains hyperlinks to world wide web pages. Readers who have the ability to access the web directly from their word processor or are reading the paper on the web, can gain direct access to these linked references. Readers are warned, however, that

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