

Creating a Conducive Environment for Deep Learning in the Classroom

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Abstract: The purpose of this paper is to suggest a way for educators to structure their class to enhance the possibilities for students to develop stronger communication, analytical, critical, and creative problem-solving skills – ultimately, characteristics that are essential for employability in the global marketplace. These skills basically give students the ability to learn how to learn, and can be achieved through learning environments and experiences that encourages deep learning. Unfortunately, the classrooms of today are all too often focused on knowledge transmission with little time spent on creating learning conditions that promote deep learning. This can be a result of the mental models of the teacher, having grown up and learned to teach in a world where knowledge transmission was a dominant role of the teacher. This paper—through research-based data and practice wisdom—intends to provide that teacher with a framework and a mental model that can help create opportunities in the classroom for deep learning while not diminishing the necessary knowledge transfer of vital information.

Introduction

More information has been produced in the last 30 years than in the previous 5,000 years combined (Lyman & Varian, 2004; Wurman, 1989). From an educational standpoint, teachers must facilitate learning that helps students develop the ability to differentiate the relevant from the irrelevant when accessing information in today's world. From an economic and business standpoint, having citizens or employees that can thrive in environments inundated with new information every second is the ultimate source of differentiation. Organizations today are seeking those individuals who exhibit both effective communication and analytical, critical, and creative problem-solving skills as drivers of success in today's ever-changing conditions. These skills and abilities can be cultivated in the educational setting if students are given the opportunity to experience conditions that promotes deep learning.

Unfortunately, the classrooms of today are all too often focused on knowledge transmission with not enough time spent on creating learning conditions that promote deep learning (Cole, 2000; Herrington & Oliver, 2000; Marton & Saljo, 1976; Resnick, 1987; Whitehead, 1929). This can be a result of the mental models of the teacher, having grown up and learned to teach in a knowledge transmission world, or in exam-oriented cultures. This paper will attempt to provide that teacher with a framework and a mental model that can help create opportunities in the classroom for deep learning while not diminishing the necessary transfer of vital information.

The suggestions offered here are drawn in large part from a naturalistic research (Lincoln & Guba, 1985) conducted by the first author in the virtual classroom (Tee, 2004) coupled with an examination of years of teaching by the second author in the world of business in four countries across the globe, with common insights attained during a stint of co-teaching together. The insights and model noted below are offered to not only help our colleagues experiment with stimulating deep learning in their classrooms but also in hopes of starting a dialog for sharing and discussing experiences in this area. The result of this synthesis was largely inspired by the work of Nonaka and his colleagues on knowledge creation (Nonaka, 1991; Nonaka & Konno,

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1998; Nonaka & Takeuchi, 1995; Nonaka, Toyama, & Konno, 2000), well known in the business and knowledge management field but less so in education.

A Framework for Deep Learning

Nonaka's model of SECI and his concept of *ba* provide important guidance toward a more holistic framework for the integration of learning activities and environment that can lead to deeper understanding. Essentially, Nonaka examines four key processes by which knowledge is created and the shared context in which these processes come alive. He refers to these processes as socialization, externalization, combination and internalization or SECI in short, which are most stimulated in a *ba*. *Ba*, loosely translated from Japanese, means "shared context."

Nonaka and his colleagues hold that there are four types of knowledge conversion. The first type of conversion is from tacit knowledge to tacit knowledge. This occurs through the socialization process that often includes conversation, observation, imitation and practice, as exemplified by the learning that occurs between an apprentice and the master. The second conversion is from tacit knowledge to explicit knowledge. This occurs through the externalization process and consists of articulating, giving voice to the knowledge in the form of symbols, language, concepts, models, hypotheses, metaphors, vignettes and analogies. The third conversion is from explicit knowledge to explicit knowledge. This occurs through the combination process, which draws on the synthesis of various bodies of explicit knowledge. The fourth conversion is from explicit knowledge to tacit knowledge through an internalization process—including reflection and action—by the learner. All these key processes must be present to fuel one another and to create deep learning. They are energized and brought to life within a corresponding *ba*.

A *ba* is essentially a place with a unifying form where knowledge can be stimulated, shared, created and utilized, punctuated by the necessary energy, quality, and medium to perform the individual knowledge conversions in an on-going and interacting spiral of socialization, externalization, combination and internalization (Nonaka & Konno, 1998; Takeuchi & Nonaka, 2004). This place can be physical, like a classroom or a field site. It can be virtual, like an online meeting place or through video conferencing. It can be mental, through shared experiences, values and ideals. Or it can be through a relationship of people sharing common learning goals and aspirations.

The Framework in Action

As it is described above, this cycle of socialization, externalization, combination and internalization may mislead readers into thinking that it is a neatly or sequentially packaged cycle of learning. It is not. The first key point is this: It is when all four processes interact with one another—both in a personal and collaborative context, involving various knowledge sources—that the "spiral" of knowledge creation becomes hyper active, a positive reinforcing cycle in Senge's (1990) terms. The greater the interaction, the more active the spiral, thus enhancing the opportunities for new knowledge creation. With each spiral, the depth of knowledge or understanding—at the individual, group and class level—become deeper.

The second key point: Merely building a learning environment (ba) is not enough to activate the knowledge-creating spiral. It needs to be "energized" to give motion and quality to the learning process, driven by both implicit and/or explicit purposes, direction, interest, and mission (without which the learning and creative energy in the classroom cannot be directed effectively). A learning environment can be significantly energized when provisions are made to enable conditions such as autonomy; fluctuation and creative chaos; requisite variety; and trust and commitment.

So what does it take to create a conducive *ba* to enhance the SECI cycle in our classroom? The below is a synthesis of findings based on research and decades of practice wisdom, with an illustrative summary in Figure 1:

Creating a conducive ba for socialization.

The main purpose of socialization is the sharing of tacit knowledge, for example values, beliefs, context-specific language, experiences, and ways of communicating, thinking or doing things. Tacit knowledge can be conveyed from one individual to another and from individuals to groups through conversations or dialogues, through experiments and creating experiences. This in itself is not a novel goal for educators facilitating learning in the classroom since encouraging open and relevant conversations in the classroom often improve the quality of the class.

However based on research and practice wisdom, the authors found that the greatest likelihood to be successful is to create a *ba*—in this case, a learning environment—that has distinctly informal and low-stakes characteristics. For example, the second author takes great effort in all his classes to let his students know that “this will not be education as usual,” while peppering comments with tongue-in-cheek statements to fuel a lively discussion. “Here we will have to talk and discuss, and learn together. I know, every teacher says this on first day, and then goes off and lectures forever. But I really mean it!” he would say. “I will expect you to know things from previous lectures, other classes... I know, I know.... it is against classroom rules of what is expected in the class... as negotiated by the ‘union.’ I know you are not use to talking and sharing your questions, ideas and experiences in class, but we will be different.” He would go on to assure them that he will not talk down on them, or penalize them for sharing alternative perspectives. In fact, in his syllabus he notes: “My promise to you is to create an environment in which you can learn, to be as prepared as possible, and to respect each of you and your opinions. I expect the same from you in all dealings with respect to this course, with me, or with your fellow classmates.” He goes out of his way to reinforce conversations with the students in the class, treating each question or point raised with respect and care. Similar things were observed in the study by the first author in a virtual setting, leading to open discussions, inquiries or explorations.

In other words, the teacher makes a great effort to create this environment, often going out of his way to break old rote learning habits and in the mean time, create a more open environment for inquiry, sharing and discussion. It can begin with a simple introduction and some icebreakers. It can begin with a simple sharing of hobbies and where they came from, and over time, their personal interests, perspectives, and experiences. The teacher takes the time to ask questions to draw out the different personalities, eventually getting to questions such as: Besides it being required (or needing an elective), why are you in this class? What do you hope to learn? In your mind, what will make this a success? What is something we all need to know about you to better understand you? How do you think it relates to your future career?

He creates multiple opportunities for students to share contextually relevant experiences through open discussions, sometimes leading them down a meandering path to emphasize the significance of the content of the course to their lives. Whenever possible, he encourages storytelling so that richness can begin to emerge. He shares his own stories to illustrate points and to show he is a learner too, making mistakes, being human and hopefully growing. Over time, the classroom can evolve into a learning space where honest opinions and experiences can be shared. At its most effective level, the socialization process will allow for a free flow of ideas and questions.

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Creating a Conducive ba for Externalization

Creating a culture of openness based on trust and mutual respect paves the way for learners to begin to articulate and make sense of what is up to this point mostly tacit knowledge, or what Nonaka refers to as externalization. When knowledge is made more explicit, sharing with the other learners becomes easier. Through more effective and efficient sharing, students begin to discover with greater certainty what they do and don't know about their own knowledge bases.

Through activities that encourages students to use metacognition (to think out loud) and to reflect (orally and in writing), they begin to develop a "common language," metaphors and analogies to begin to grapple with what is being learned. Writing activities and development of proposals, models or prototypes for more focused discussions can begin to "concretize" previously loose understandings of the concepts being studied. The teacher takes the time to ask questions that relate course content to their own lives (How does this relate to what you hear at home, read in the papers, see on TV or even YouTube? How might it relate to your future career?), carefully leading them down deeper and more probing questions and discussions (How does this relate to other things you learned? How does it relate to your personal and other educational experiences? Explain... tell us more. What is another way to explain that?). He creates multiple opportunities for sharing contextually relevant experiences through open and facilitated discussions and group-oriented activities. Ultimately, students are beginning to engage in sense making and articulation of ideas, perspectives, experiences and ways of doing things. Implicit within these processes, students learn to critique and respond to critiques.

Creating a Conducive ba for Combination

As the learning environment develops, dialogues become more meaningful and written reflection begins to take a more informed characteristic. As this begins to happen, each student should begin to draw knowledge and understandings from different sources—including required readings and notes from other courses, their professional and personal experiences, interactions from within and without the classroom—to cultivate "new" knowledge. Students are further challenged to consider if these related sources support or contradict with the ideas being considered and to explain their rationale. They are even asked to consider what questions they may have at the particular point. This process of synthesis is referred to as combination. At this stage, learners are given the opportunity to organize and share their new understanding in a more systematic context that may be more formal and are of higher stakes (e.g. higher grade weightage). Besides discussions and typical writing assignments, this may come in the form of formal project presentations, papers or other deliverables, or exams.

Again, these options of learning activities or evaluations are not in it of itself unique. What are unique are the accompanying activities that take place in order to complete these activities. Students meet within their working groups, with external informants or to seek out whatever knowledge sources needed to seek out potential solutions to the issues they are facing. The teacher also takes the time to ask for progress reports, to meet students individually or in groups, functioning more like a facilitator or consultant than a teacher most of the time. Here the key role is primarily to help students learn to ask the right questions, to identify beneficial sources, to begin to process information and do analysis, to begin to break down and order the activity in doable steps i.e. to help with both content development and skill development. If students are unable to find answers immediately, the teacher nudges them towards knowledge sources that can help them. If students are having group issues, he can offer counsel on how to affectively deal with the issue, even intervening in extreme cases. Students can become somewhat uneasy

with this process, but with proper guidance, many will find their footing and more importantly they begin to develop the ability to learn independently.

Creating a Conducive ba for Internalization

The learning is not quite complete yet. The student must make the knowledge his own, or in other words, personalize it. This can be achieved by creating numerous activities for reflection and action, many of which would have occurred in some shape or form in the socialization, externalization and combination process. For instance, the teacher can ask at the end of assignments or discussions, "what did you learn from this exercise? How does it relate to other things in this class? How might you apply this in your own day-to-day living?" Or periodically through the class, the assignment can be to reflect on everything to date and identify the three most important things one has learned and why they are important. Essentially, by creating engaging and interactive authentic or simulated conditions, learners are given opportunities to act on their new understanding. In doing so, the individual begins to gain insights that can be characterized as developing a deep understanding that enables a person to see a once inert concept "come to life." When knowledge becomes one's own (personalizing), he can begin to explain and use it in his own creative ways. Additional activities such as reflection papers and *kaizen* (continuous improvement discussions) can help stimulate the internalization further.

Integrative not Linear

In practice, the above four steps are not linear but blend and reinforce each other. Often an activity may contain pieces of all four processes. Take for examples "current event" activities used by the second author. He first asks each student to identify a current event and submit it with a write up summarizing the key points of the event, why he chose it (externalization) and how it relates to the course (combination). These are collected, read and grouped into common themes related to the course by the teacher. Then, the themes are introduced and students are asked to discuss and share their current event with the class based on a particular theme (socialization) and the teacher notes how it relates to course materials and current news (combination). Finally, the teacher summarizes the day to illustrate how "we are living the class in the real world" and asks them to reflect on their learnings for the day (internalization).

Characteristics that Holds the ba Together

As recommended by Nonaka and colleagues (Nonaka & Konno, 1998; Nonaka & Nishiguchi, 2001), the learning *ba*(s) described above were energized by providing enabling conditions of:

- i. *Autonomy, with love, care, trust, and commitment.* Throughout the class, the teacher's main intent is to enable and empower students to learn on their own. He doesn't simply teach – he creates a trusting and mutually respectful environment, coaching his students to learn to ask questions, and guiding if not cajoling them occasionally to consider different means to find answers or explanations. Indeed this is probably more important than any fact that is covered in the class.
- ii. *Fluctuation and creative chaos.* When students are learning to be empowered learners, one must expect for conditions to become ambiguous and stressful at times. Language to make the implicit explicit is always cumbersome, even more so for those who are attempting it for perhaps their first time. This awkwardness should not only be welcomed, but perhaps designed into the broader learning environment and openly discussed.
- iii. *Redundancy and requisite variety.* Students are often inclined to ask the teacher for the right answers, without attempting to work one out themselves. The teacher must

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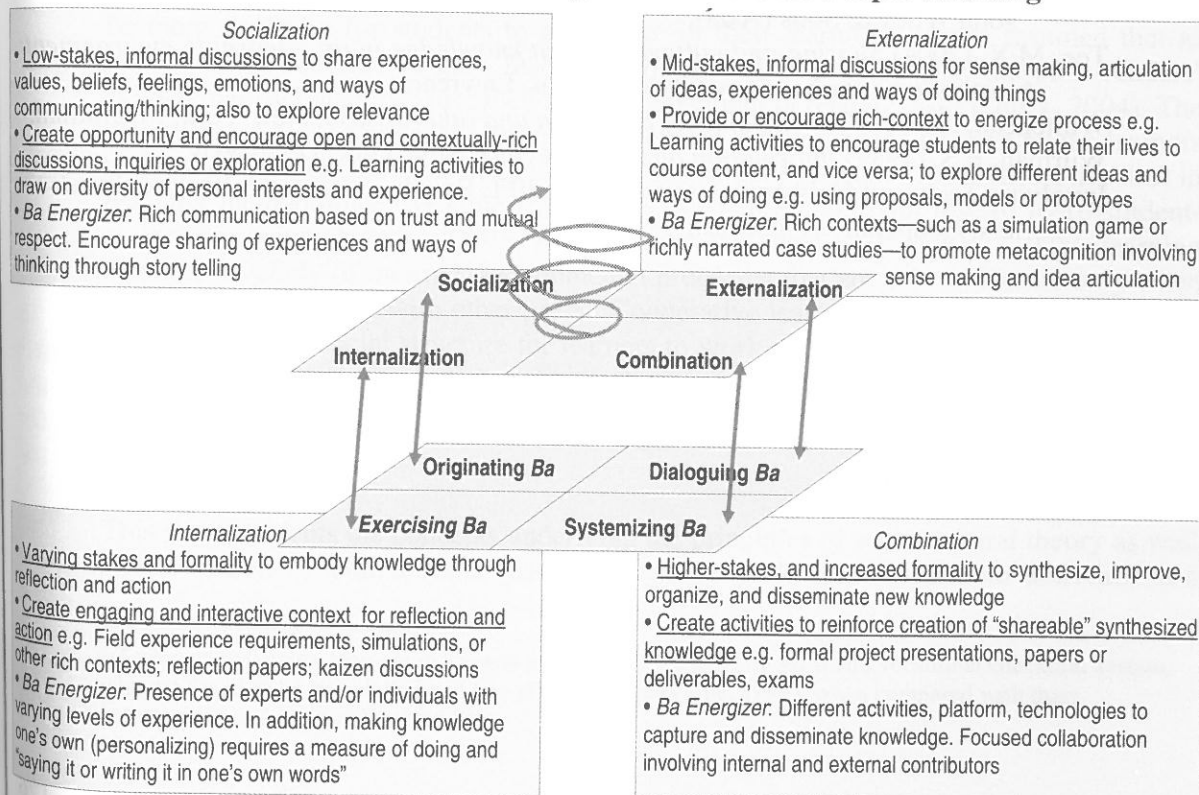
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learn to turn to the class and ask them questions such as the following: "What do you think? How do you answer this or at least begin to answer this? What did you learn in class that may help?" In one of the classes researched, the information from a relatively sophisticated simulation game "forced" students to learn to deal with information overload, and to begin to understand how to discriminate the most critical information from the generally important information. Another example took place in the classroom of the second author, who had his students read a business novel rather than a traditional textbook. After a certain number of chapters, he would facilitate the discussion asking questions like: if you were the main character, given all the variables described in the book, how would you solve the problem? What might help? How do you at least start?

Conclusion

More than seventy years ago, Whitehead (1929) criticized traditional formal education for teaching inert facts rather than helping students develop meaningful knowledge. More recently, Resnick (1987) and Cole (1990) noted that the hallmark of traditional school and university learning have been the separation between knowing and doing – basically, extracting essential principles, concepts and facts, and teaching them in an abstract and decontextualised form. As discussed above, Nonaka's model of SECI and the concept of *ba* can provide guidance on how these phenomena can be reversed. As an educator, this holistic framework can be used to consider and experiment with learning activities and the design of your learning environment that can help promote deep learning in your classrooms. An illustrative summary of this discussion is provided in Figure 1. The authors also hope that this would stimulate further dialog for sharing and discussing experiences in this area, to embark on a SECI cycle of our own. Perhaps a *ba* can be created for this purpose.

FIGURE 1 Creating a Conducive Learning Environment for Deeper Learning



References

- Cole, R.A. (2000) *Issues in Web-based pedagogy: a critical primer*, Westport, Connecticut: Greenwood Press.
- Herrington, J. and Oliver, R. (2000) 'An instructional design framework for authentic learning environment,' *Educational Technology Research and Development*, 48:3, 23-48.
- Lincoln, Y.S. and Guba, E.G. (1985) *Naturalistic inquiry*, Beverly Hills, California: Sage Publications.
- Lyman, P. and Varian, H. R. (2004) *How much information*. Retrieved September 10, 2004, from <http://www.sims.berkeley.edu/how-much-info-2003>
- Marton, F. and Saljo, R. (1976) 'On qualitative differences in Learning I: Outcome and process,' *British Journal of Educational Psychology*, 46, 4-11.
- Nonaka, I. (1991) 'The knowledge-creating company,' *Harvard Business Review*, 69(Nov-Dec), 96-104.
- Nonaka, I. and Konno, N. (1998) 'The concept of "ba": Building a foundation for knowledge creation,' *California Management Review*, 40, 15.
- Nonaka, I. and Nishiguchi, T. (2001) *Knowledge emergence: Social, technical, and evolutionary dimensions of knowledge creation*, Oxford: Oxford University Press.
- Nonaka, I. and Takeuchi, H. (1995) *The knowledge-creating company: How Japanese companies create the dynamics of innovation*, Oxford: Oxford University Press.
- Nonaka, I., Toyama, R. and Konno, N. (2000) 'SECI, ba and leadership: A unified model of dynamic knowledge creation,' *Long Range Planning*, 33, 5-34.
- Resnick, L. (1987) 'Learning in school and out,' *Educational Researcher*, 16:9, 13-20.
- Senge, P.M. (1990) *The fifth discipline: The art and practice of the learning organization* (1st edn), New York: Doubleday/Currency.
- Takeuchi, H. and Nonaka, I. (2004) *Hitotsubashi on knowledge management*, Singapore: John Wiley & Sons (Asia).
- Tee, M.Y. (2004) *Sharing and cultivating tacit knowledge in an e-learning environment: A naturalistic study*, University of Kansas, Lawrence.
- Whitehead, A.N. (1929) *The aims of education and other essays*, New York: Macmillan.
- Wurman, R.S. (1989) *Information anxiety* (1st edn), New York: Doubleday.
- Involving Technical University Learners in an EFL Reading Course: A Socio-cultural and Cooperative Approach