Module 1
The SITE Model: Learners in Context

Introduction

In this module, you'll examine a new model for understanding learning "situations" or contexts--a way to think about learner background, interests, goals, challenges, and opportunities as a total context that must be considered when designing instruction. At the end of the module, you should be able to:

1. name and describe major aspects or "subcontexts" of the model;
2. explain how these aspects interact to create an overall context for learning and instruction;
3. apply the model to analyze simple case studies representing instructional problems and opportunities.

Problems with Classical Models of Instructional Design

Discussion on education and instruction in recent decades has focused on how to make learning relevant to the "real-life" situations of learners--on better ways to help learners build on their background and previous experience, better ways to help them develop knowledge and skills they will need to participate fully in society and in life. Much of this discussion has been influenced by constructivism, a broad movement in education with many implications for instructional design. You'll find more links to constructivism in this module's Extend section.

Classical schools of instructional design were largely based on behaviorist psychology. Behaviorist psychology tends to favor instructional development models that are prescriptive and fairly linear. Classical ID models tend to ignore certain limitations in human cognition that have become painfully obvious in the last 20 years of research in cognitive psychology. In the 70s even cognitive psychologists tended to assume that abstract human knowledge such as concepts, principles, and theories could be applied or "transferred" across a broad range of domains or contexts. This is apparently very difficult for humans--much more difficult than applying knowledge in situations relatively similar to those where it was first acquired. Thus students who learn about entropy in a chemistry class in the context of chemical reactions may not see how entropy can be used to describe the organization of biological communities or lead to predictions about the ultimate fate of the universe.

Research on this idea of learning situated in a context has led many cognitive psychologists to the conclusion that human cognition is especially well adapted for acquiring and applying knowledge in situations, but not so well adapted for applying abstractions to new or different settings.

Situated cognition reminds us of the problem of inert knowledge, a term coined by Alfred North Whitehead to refer to knowledge that does not come to mind when it would be appropriate or useful. Inert knowledge sits statically in the human mind, stuck in the situation where it was learned. When there is a new circumstance in which that knowledge would be relevant, the mind does not consider using the knowledge. This is not the same as saying that the person does not "know" the information, only that the person cannot connect this information to a situation where it might be used. Thus the individual might perform well on a test but not be able to apply what they know to "real life" problems. Some studies suggest that college students really do remember 10 or 15 years later knowledge that they demonstrated on exams. But the question is, can they apply this knowledge? Inert knowledge exists in the brain, but does not get employed in life circumstances. As instructional designers our challenge is not only to help students to

learn but also to design opportunities for application to realistic contexts.

Meaning and Usefulness Depend on Context

But what is context? Context effects are among the most important and widely studied phenomenon in psychology. Here's a simple example of a context effect.

We interpret the same symbol as two different letters depending on the context in which the letters occur. This is a context effect because what governs perception of a letter is not only the stimulus properties of the letter itself, but the situation in which it is displayed.

Here's another example of a context effect.

People tend to see women of quite different ages in this drawing depending on how they're oriented--whether, for example, they're told a story about a young and attractive heiress or an elderly widow. Can you see both?

Created by cartoonist W. E. Hill, originally published in *Puck* in 1915 as "My Wife and My Mother-in-law."

Stereotypes present another example of context effects. For example, a 250 lb. man, with huge torso might seem a superhero on the football field but a threatening rogue in a dark alley.

Our concerns extend beyond these well-studied perceptual effects. Now, more than ever before, tools, systems, and strategies for performing tasks integrate multiple functions. Grandma's old typewriter is now a word processor. Yet the word processor does far more than imprint sheets of paper with characters. It can create web pages, lay out a newsletter, solicit information for a database, generate form letters, send e-mail, compare documents, calculate budgets, create an index, check grammar and style, and so on. Which of these functions does a user/learner need to know about? It depends on the context.

All of us perform tasks in many different settings, but sometimes have difficulty "shifting gears" or transitioning our performance from one setting to another. Almost miss the off-ramp because you were in the middle of a romantic fantasy? Still thinking about work when you're putting the kids to bed? Trouble getting those riffs right in your blues band because you're thinking about

how great you'll be on tour? How useful is your thinking? It depends on the context.

Functional Context Education and the SITE Model

Functional Context Education (FCE), developed by Tom Sticht and his associates, advocates the creation of learning and instruction that integrates the learning of skills with the context in which the learner will apply those skills. We'll examine FCE in more detail in a subsequent module. Instead of organizing learning around "topics," functional context education emphasizes performance-oriented learning, in order to make sure that learners will be able to utilize their skills outside of the classroom or training environment. Contemporary cognitive science supports functional context education with empirical evidence that the most effective way to teach intellectual skills is "in context." Consistent with Functional Context Education, the SITE Model explicitly defines the context for learning and performance in terms of the learner's motives, social relationships, literacy, and access to tools and resources.

The SITE Model outlined in this module addresses some of the major factors that instructional designers need to consider regarding the contexts in which instructional products might be employed and the purposes for which such products might be used. This module considers the learner?s motives and goals, techniques for accomplishing these goals, and the kinds of literacy or "information know-how" that the learner will need to master in order to understand and use these techniques.

Use the Bb Arrow to move to the next step in this I-CARE module - advance to the **Connect** segment.

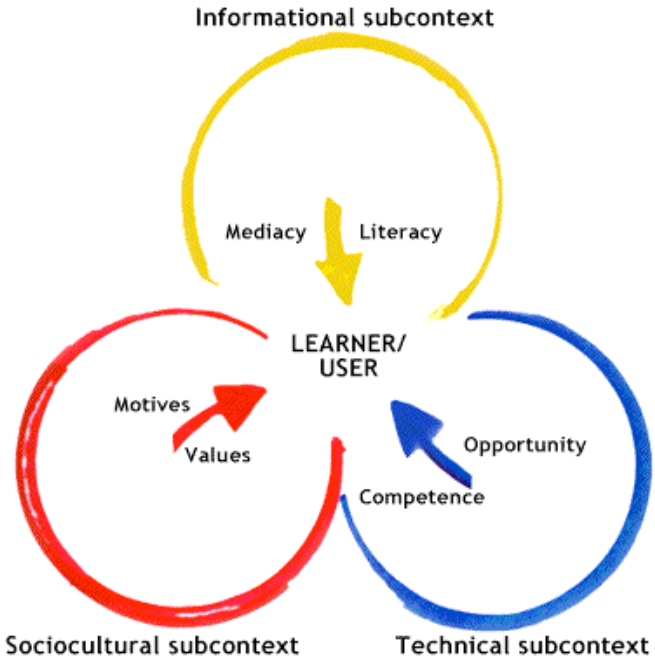
Module 1
The SITE Model: Learners in Context

Connect

The SITE Model

The word **context** was originally French for **interweave**, as in textiles and fabrics. Metaphorically, then, a context is made up of many threads or connections. The SITE Model weaves together connections between the learner and three subcontexts, all against the background of a larger educational context.

Educational Context



Rather than considering the learner as an isolated entity, this model examines the learner in context. So, the learner, in the center of the model, provides the focus for the various subcontexts. Because the SITE Model can be applied to understand usability problems, it also refers to the learner as a product or system "user."

The SITE Model offers a learner centered framework for designing and implementing contextualized learning experiences?experiences that are closely related to situations in which the learner will apply knowledge and skills acquired through instruction. If learning in the exact performance context is not possible then contextualized learning strives to create situations similar to those in which the learner will actually perform or work. In short, we want to understand the context of learners/users so that we can design products that will empower them to engage constructively and productively with that context?to acquire skills and knowledge that will enable them to use resources at hand to accomplish worthwhile goals. On the other hand, narrowly conceived instruction may deprive learners of the ability to generalize their knowledge and skills to multiple circumstances. This problem challenges all instructional design efforts: how to facilitate an appropriate degree of knowledge and skills transfer to different situations.

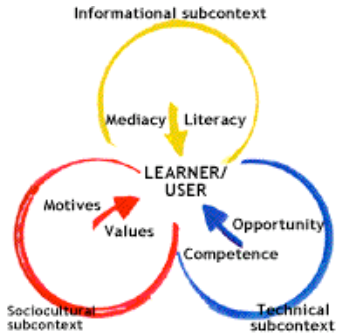
Like many analytical models, SITE attempts to describe and explain the learner/user?s context by understanding systems components. In this case, the system components are three interconnected subcontexts embedded in a larger overall educational context such as a school, course, or training program.

Sociocultural

Informational

Technical

Educational



Sociocultural Subcontext

Family, peers, role models, mentors, community, employer or enterprise all contribute to and influence the social and cultural context of the individual learner. The SITE model assumes, perhaps arguably, that individual values, goals, motives, and intentions rarely arise in a social or cultural vacuum and that to understand the learner as a "whole person," designers need to understand social and cultural influences. Few commercial products in the contemporary world make their way to success without some consideration of these influences. Instructional products, our focus in this course, are no exception to this rule.

To design effective instructional products, we need to understand the factors that might motivate a learner to invest in the process of learning, how that learner will perceive learning as relevant to their goals and motives, and how they might perceive potential benefits and drawbacks to engaging with the products and environments we might design.

Technical Subcontext

The technical subcontext confronts the designer with issues of opportunity and competence. What tools, devices, procedures, systems, strategies, tactics, or techniques would empower learners to achieve their goals? How competent is the learner in using these devices, systems, and tools?

Our examination of the technical subcontext will emphasize the ways and means, the techniques, by which prospective learners might achieve their goals. So we must be on the alert for concrete, action-oriented learning opportunities that connect directly to the learner's goals. Learner motivation flourishes when learners can see how the ways and means of the technical subcontext will help them to realize their goals or pursue values that are in accord with cultural and social influences.

Here use of the phrase technical subcontext, does not necessarily imply that the SITE model is limited to developing narrow instruction in technology-related disciplines (wires, buzzers, computers, etc.). "Technical" as we?re using the term, is closely related to the word "technique," meaning the method of performance in any discipline, and we take even this meaning fairly broadly. Thus, designers have successfully used the SITE model to analyze the context for students who need to learn how to

- interview abused children;

- avoid food allergies;
- run better business meetings;
- foster interests in reading;
- counsel students about AIDs risks.

In addition, designers need to consider how mastery of a technical subcontext might enhance development of knowledge that is more conceptual or academic. For example:

- Electronics labs can be used to support physics education and ground theory and abstractions in actual practice.
- Logic in a sense is a technical groundwork for philosophy.
- Fieldwork supports studies in anthropology or sociology.

Relationships Between the Technical and Sociocultural Subcontexts

Most people are interested in technical systems because they want to use these systems to accomplish goals. Most of those goals in turn originate in a social or cultural context. Possible motivations for using a VCR, for example might include recording the Super bowl or preserving quiet on Saturday morning by recording cartoons for children to watch later. Both of these motivations stem from the individual's social setting.

Word processors serve as another example. People might want to use a word processor to start a business, send out Christmas cards, or to complete school assignments. These motivating factors would be explainable in terms of values or goals that emerge from a sociocultural context. Instructional designers need to examine the technical subcontext in light of the sociocultural subcontext.

On the other hand, people often do not formulate goals until **after** they become aware that opportunities exist for realizing these goals. On encountering a rock cliff he has never seen before, a rock climber decides he?ll try to get to the top. A customer wandering around a discount hardware store might not have ever thought of solar heating for her home until she saw the demonstration on how easily the equipment can be installed.

Human beings are not just problem-solvers but seekers and exploiters of opportunities that appear consistent with their values and self-perceived capacities. Previous discussion of the SITE model characterized the technical subcontext as the "ways and means" by which learners can accomplish their goals or realize accomplishments in accord with their values. Yet, good instruction frequently helps learners to understand **new** opportunities and to formulate goals related to those opportunities. Deep and lasting engagement with these new goals is unlikely unless the goals accord with underlying learner values.

Informational Subcontext

What resources exist to help the learner **employ** the ways and means represented by the technical subcontext to achieve worthwhile goals? What skills and knowledge do learners/users need that will help them access the principles, rules, guidelines, directions, suggestions, conventions, codes, and so on that will allow them some measure of control over tools, systems, devices, procedures. The SITE model broadly characterizes these skills that govern an individual's ability to access information as literacy and mediacy.

Consider *Microsoft Word*. It is quite complicated. In fact, Bill Gates has pointed out that Word has far more independent elements or component parts than a Boeing 747.

Word comes with a thousand-page electronic manual. It has online help, balloon help, contextualized help, a multimedia tutorial, templates, examples, and tables--all information resources that learners can use to teach themselves how to use Microsoft Word. Yet, despite all of these resources, many users complain that they can?t find the help they need and they remain

largely ignorant of the many capabilities of Word that might be related to everyday problems the users would like to solve. Or they find the help, but they do not have the skills to translate found information into operational performance.

Rather than using the manual or other information resources many people consult with friends and colleagues because they are unsure how to make effective use of the Word?s adjunct learning resources. This is a classic example of the need for literacy and mediacy skills. What does mediacy skills mean?

Rethinking Past Notions of Literacy

Literacy is not the same as letteracy, a term popularized by Seymour Papert to indicate the study of letters and the ability to process letters. Yet literacy is not the same as the ability to phonetically decode letter sounds, regardless of what people tell you.

Literacy as utilized in the SITE Model refers to print-oriented literacy and numeracy. It is a fairly narrow definition. Mediacy, on the other hand, is described by Paul Strassmann as, "the ability of individuals to successfully cope with communications in their civilization." These communications range from speech to motion pictures to dynamic illustrations to a wide range of multimedia resources including online databases and other resources. In general literacy and mediacy together define an individual's ability to get information and knowledge from external sources where it is stored, regardless of whether its stored in books, web pages, video tapes, multimedia films, telephone books, the encyclopedia, and so on.

More specifically, focusing on literacy and mediacy is a reminder to designers that learning to read is not the same as reading to learn. We have been raised to think of school as a place where we learn to read. This conventional notion of schooling can be reversed so that learners are actually developing literacy and mediacy skills in the process of acquiring the technical means that are associated with the domain of their interest. Rather than learning to read, the students are reading to learn.

The Educational Context

Sociocultural, **I**nformational, and **T**echnical spell out the first part of the SITE acronym. Yet all of these subcontexts must be considered in the larger context of education (thus the added "E") which almost always implies development of broader perspectives and understandings. While the SITE Model is focused on fairly specific goals and techniques for achieving them, it?s only one element in larger, more inclusive visions of education as development of a whole person and enrichment of a whole society.

Learning to Learn

Take a look around the next time you visit a large warehouse computer store or hardware store and notice the number of options for independent learning: "how to" books, instructional videotapes, "just-in-time" instruction on how to lay sod or install a disk drive. The stores are also full of autodidacts-- people who have learned or can learn subjects without the benefit of a teacher or formal education. Reading to learn is part of learning to be an autodidact. In the age of smart machines we are offered a widening range of learning resources, but are we ready to use them? Are your learners already autodidacts, or do they need to be taught how to be an autodidact?

One way to think about this is to examine the way people learn to use, or might learn to use, a typical application like a word processor. Built in electronic resources are immediately available upon software installation, but are infrequently used by many novices or beginners. For example the menu bar is there in both the Windows versions and Macintosh versions of Word, but how many novices or beginners actually systematically search the menu in what we call the menu-item search strategy (MISS)? Do people use the MISS to find out what affordances, (roughly, ways and means) are there for them to use?

Macintoshes now have balloon help and a very powerful Apple Guide. The Apple Guide lets developers create on-line, simple, easy to follow tutorials. Many applications have on-line help directly built into them. This on-line help is much more specific than the generalized help that one would find through the balloon help or apple guide systems. Many programs also have

something called contextualized help, which is sensitive to exactly what features the user is actively involved with when they make a decision that they do need to activate help. And finally there are on-line resources such as Wizards. These Wizards are powerful electronic support systems that help users make decisions about how to generate the basic form or layout for a document. Other electronic support features that exist in most word processors include:

- Custom menus and toolbars
- Electronic tutorials
- Sample documents
- Template files
- Indexes
- Headers

In order to utilize electronic resources to their full potential the user needs to be able to engage with the system and learn to learn how to take advantage of these resources. The interactivity that electronic resources require is a relatively new mediacy skill. Offline resources that require a similar willingness to learn to learn include manuals and guides, requiring certain sophistication in using features such as the table of contents.

In addition, the user must be willing to interpret the text in manuals, guides, and other text-based resources by trying to apply the information immediately. Systematic disambiguation of confusing portions of the text is also often necessary. The wide and varied contextual applications of most software programs make it almost impossible to write a manual that is perfectly clear for every situation. Therefore every user is going to have to be prepared to look at the text, think about what it means and try to eliminate some of the ambiguities that are inherent in text based information by testing them against real-time use of the system. Users need to be prepared to systematically experiment with features, to troubleshoot and so on. These are clearly skills that require a certain type of literacy. But this type of literacy may be new to people who are literate by conventional standards. For example a well learned professor may find it difficult to engage in the kind of interactive give and take with the system where they need to consult a manual, try something out, consult a manual, try something out again. This new form of literacy is quite different from reading a book or making margin notes.

Learning a word processor also means:

- Being able to create job aids and other performance support tools.
- Being able to record histories of problematic interactions so that one can get assistance from coaches or customer support services.
- Being able to use effective metacognitive skills, being able to think about how to think when one is using the word processor.

In this age of information overload, success depends on an individual's ability to use autodidactic strategies. People need to be able to define and monitor goals. Time for learning needs to be included in a new task. Coaches and mentors become indispensable.

The truth is that software and other work environments are becoming much more complicated. There simply is no way for many of these environments to be captured in formal instruction. As mentioned before, the recent manual for Word is 900 pages. Word is such a flexible and powerful program that there is no way that all of it can be taught through formal instruction alone. Instructional designers need to begin orchestrating and designing instructional activities so that they prepare learners to teach themselves.

Use the Bb Arrow to advance to the next step in this I-CARE Module - advance to the **Apply** segment.

Module 1
The SITE Model: Learners in Context

Apply

Case Studies

The following case studies illustrate learning in context. These studies illustrate how to use the SITE Model to examine the learners' goals, the technical means, and informational resources that are available to them. Finally these case studies attempt to demonstrate how the SITE Model can help build an educational context that will provide learners with access to technical means, and the informational resources to help them use the technical means to achieve their goal.

You will complete two sections in this apply portion of the SITE Model Module. During the first section you will read and think. During the second section you will respond to questions about a specific scenario using a multiple choice answer format.

Section 1

Directions: While reading the case studies, think about how you would describe the educational context using SITE Model terminology.

Telephones and Word Processing

Consider a videotape with instruction about the evolution of the telephone. The videotape goes into detail about the specific parts of the telephone, how they were developed and how they work.

This videotape is not bad instruction if the learner is a repair person and his/her goal is to learn about the technical aspects of telephones. However, if youngsters are signed up for a course to learn how to use telephones they might have something different in mind, like being able to call up their friends. The technical information about telephones would not be particularly relevant to their goals. The telephone is the same technical system in each situation, but the organization of instruction will vary according to the goals of the users.

The same would be true in the case of word processing. One of the miracles of Microsoft Word 6.0 is that it is incredibly flexible and there are a huge number of tasks that people can perform with it. Every user is going to be coming to a workshop with a different set of goals. The wide variety of user goals make it very difficult to think of doing stand up, standardized, one-size fits all instruction. The SITE Model encourages designers to look at that sociocultural component and ask what is driving the people in this course? Why do they want to be here, or if they don't want to be here, how can we get them to want to be here?

Negotiating Learner and Enterprise Goals

Negotiations must take place when learner goals are different than the goals of the enterprise that hire them or the community that produces them. For example, consider the case of Spiffy Talk, a hypothetical multimedia development language. A school or community might be interested in having students use this language to learn how to think clearly, more logically, more critically. But this might be very different than the user goals for 6th graders who want to learn how to use computers to make cool stuff like animation and music videos. However, it is clear that with a little bit of creativity and institutional planning it is possible to reconcile these goals and create an educational context where learners pursue their goals at the same time that they are developing the skills that the community or enterprise expects.

Often there is a similar need to reconcile user goals with the goals of the enterprise in a corporate setting. For example, consider managers who are expected to learn how to use spreadsheets to solve corporate problems. From this point of view the goals of the enterprise are to have managers master certain elements of spreadsheet technology. Corporate Headquarters might state their goal as: "Middle managers must be able to submit department budgets as electronic spreadsheets and modify standard corporate templates as appropriate." The managers may feel somewhat different about it. They might like to use the same spreadsheet application to manage home budgets and tax returns. The middle managers might state their goal as: "We'd like to be able to use a spreadsheet application to manage home budgets and tax returns."

These different goals and the technical means that the system provides to reach the goals can be reconciled. In a training program for middle managers, one way to do that would be to teach the managers to use the spreadsheet application and then encourage them or guide them to practice using it at home. The benefit to the corporation is that much of the practice and training is then offloaded to the home environment where the corporation does not have to foot the bill.

It is not always possible to reconcile the interests or goals of the learner with those of the enterprise or community but it is worth attending to because it makes for much more powerful and motivating instruction and learning opportunities. After internal motivators have been exhausted other adjunct methods may need to be considered. For example, incentives, rules, pressure and so on can be used to create artificial goals for a learner.

Instructional designers also need to consider that many learners are not, in the context of the immediate learning, part of a well defined community. For example, a customer who is learning how to use a new piece of software is not necessarily interested in learning the software because a community or an enterprise wants that learner or user to learn the software.

HyperTalk

Several years ago a team was going to design an instructional product to teach bilingual 7th grade students how to program in a multimedia application, called HyperCard using HyperTalk, a programming language. Examining the goals of the school and the community that surrounds that school many parents would probably say: "That's great! My kid is learning a little bit about how to program a computer, my kid is learning a little bit about logic, my kid is learning a little bit about discipline."

But the interesting part of the conversation was when the design team was challenged to consider the following question: What are the user goals? At first the designers thought the user goal was to learn HyperTalk. However, upon deeper examination of the issue, the designers realized there was little evidence that 6th grade students would, out of the blue, want to learn HyperTalk. Instead HyperTalk needs to be connected to the goals of those users that are embedded in their sociocultural context. For example, most 6th graders like graphics and music and therefore the designers might want to promote the music and animation components of HyperTalk, thus connecting HyperTalk to a true learner goal. Instructional designers need to connect the possibilities that are in the technical domain or technical context with the user's goals.

Teaching Excel

Shifting to a corporate context, imagine being hired to teach sluggardly government employees Excel. The employees are grumbling that they like their job and don't want it to change. The designer might contemplate creating a plausible case for the skills they are learning at work, and are going to be using on the job are skills that they could use at home. Showing the employees how they can use Excel to manage family finances, to run their hobby, to deal with their business, and to teach their kids, might provide internal motivation for these employees. Also, looking at the employee base, the following should be considered:

- What social goals, other than the strictly work related social goals, can be employed to motivate employees?
- What coercive and monetary goals could be applied here to get people interested in developing the skills?

- How can you offload large amounts of the learning activity to some other venue where the company is not paying them, where in fact they are enjoying it, and where there are ancillary social benefits?
- How can you engage the whole person?

Section 2

Directions: Read the following educational context description. When prompted, use the SITE Model to analyze the educational context.

That Messy Room

John, you need to clean up this room! It's a pigsty! Every time I walk in here I'm in danger of tripping and breaking my ankle!"

"Awwwww mom, can?t a kid keep his room the way he wants?! If I clean up the room I won?t be able to find anything! Besides, I?m ten now, and I?m starting to need more space! My room is my domain right? You said that if my room is swept clean of sand and dirt, and if there is no dust on the shelves, then it is clean. Well, the toys are clean, the floor is clean, and the shelves are clean. I want to keep my toys on the floor where I can see them!"

"I have just added safety to my list of concerns for your room John. Come on out to the kitchen and let?s see if we can figure out a clean room plan that will work for both of us."

Grumble, "Hmpf!"

Dragging his feet, frown on his face, shoulders slumped, John follows his mom to the kitchen table, certain that he will be unable to avoid the horror of the impending doom of a clean room.

Mom brings paper, pencils, and markers to the table.

"Alright John. Let?s see if I understand you. You want to keep your toys on the floor so that you can see them and play with them. Is that right?"

John nods glumly.

"Now, I want to be able to walk through your room without tripping."

"Maybe you should practice running obstacle courses mom! That would help you make it through the obstacle course in my room!"

Stifling a smile, mom starts drawing a map of John?s room on a piece of paper. "Son, that?s not an acceptable solution to the problem, but I think I have an idea. If we create a storage system that will let you see your toys when they are put away that will take care of one of your desires. You also have enough floor space away from the main walkway in your room to be able to play with some of your toys on the floor. So part of your floor space may be used for toys, but not all of it."

John, thinking he was going to have to put away every toy he was not using at the moment, perks up. Maybe there will be room for more than one toy on the floor at a time.

"Look," says Mom, placing a star in the middle of two rectangles on the room map, "here and here are perfect places for toys on the floor. Once those spaces are filled up, you will need to make a choice about which toys you want to keep out and which ones you will put away. The toys that you are not using will be stored in the storage system we will create, where you can see them and reach them when you want them."

John ponders the map a moment, thinking about his Legos and his models and his newly acquired Star Wars action figures. Will they all fit in those spaces? Yes, they will, he decides.

"Alright mom, it?s a deal. What will we use for the storage system?"

"I was thinking we could go buy some of those clear plastic containers. Also, on this wall and this wall," said mom, pointing at the map, "we could put some shelves and pegboard. The plastic containers will go on the shelves, and your baseball bats, glove, tennis rackets and light saber will hang on the pegboard."

"Sounds good. How am I going to remember where to put everything?"

"We?ll make a checklist," said mom, taking another piece of paper and numbering one through four on it. "Number one is the pegboard for baseball bats, tennis rackets, light saber, and baseball glove. Number two is your closet, all clean shirts, jackets and shoes go there. Number three, the clothes hamper, all dirty clothes belong in that hamper. Number four, our new storage system, those plastic containers. Put Legos, action figures, Sega games, toy cars and toy trucks in appropriate plastic containers."

John's Checklist
1. Pegboard: baseball bats, tennis rackets, light saber, baseball glove.
2. Closet: clean shirts and jackets, shoes.
3. Clothes Hamper: dirty clothes.
4. Plastic Containers: Legos, action figures, Sega games, cars and trucks.

"Okay mom, that helps. Let?s go get the pegboard and plastic containers."

Four hours later John?s room is all set with the new storage system. The map and checklist are taped onto his door. John and his mom quickly mess up his room, putting things all over the floor. Then they use the checklist and map to put things away in the proper places.

"John, do you realize that took only fifteen minutes? I wonder if you could do it by yourself in ten minutes?"

"You bet I could!"

"Alright, let?s take things out and put them on the floor again. We?ll set the timer and I?ll go outside and work in the yard. When you?re done putting things away we?ll see how quick you did it."

Ten minutes later. "Mom, I?m done!"

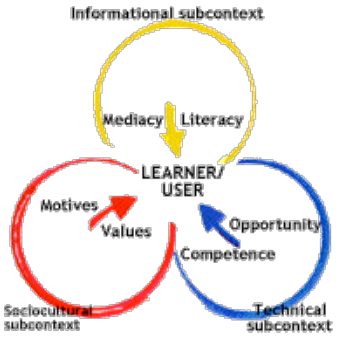
Mom comes into the room, looks at each item on the checklist, verifying that they have all been accomplished. She then checks the map and the floor, to make sure that the toys John has left out are in the agreed upon places on the floor. Seeing that they are, she gives John a huge smile and says, "Well done son!"

John beams and says, "I?m hungry. What?s for dinner?"

Smiling, mom puts her arm around John?s shoulders and gives him a quick hug. "How about we go out to your favorite place tonight?"

The Messy Room: SITE Model Practice

Directions: Identify where the following elements fit into the SITE Model by clicking on the radio button next to the appropriate subcontext.



1. map

- sociocultural
- informational
- technical

2. new storage system

- sociocultural
- informational
- technical

3. safe room

- sociocultural
- informational
- technical

4. play with toys

- sociocultural
- informational
- technical

5. checklist

- sociocultural
- informational
- technical

Use the Bb arrows to advance to the next setp in this I-CARE module - advance to the **Reflect** segment.

Module 1
The SITE Model: Learners in Context

Reflect

The SITE Model: Recap

The SITE Model is a learner-centered framework for designing and implementing contextualized learning experiences. The SITE Model embodies an educational context. Specifically the SITE Model is focused on the learner and the relationship between the learner and the sociocultural subcontext, the technical subcontext and the informational subcontext.

Fundamentally the SITE Model is concerned with helping the learner to understand their goals, whether the goals are derived from the directly and explicitly stated needs of the enterprise, or whether they are more individual kinds of goals. The SITE Model focuses on helping the learner link those goals with the means that the technical subcontext provides for realizing the goals. In addition, the SITE Model examines how the informational resources can help the learner utilize the technical means that are available to them.

Project Connection

The SITE Model directly relates to our class project because two of the critical questions you are going to ask in the early phases of the project are:

- What kind of technical system are we concerned with?
- What are the typical user goals for that type of system?

While considering user goals you also have to allow for the fact that the user goals may not be the same as the enterprise or the community. Then you have a process of figuring out how you are going to reconcile the user goals with the goals of the community. How will you integrate and negotiate these two goals to create effective instruction?

The SITE Model: Asking Questions

The SITE Model offers us a framework for asking questions. As you explore the educational context of your project, you will interview people who know something about the learners and how they interact with the sociocultural, technical and informational subcontexts.

The Sociocultural Subcontext

Starting with the sociocultural subcontext think in terms of a broad question:

"What motivates (or could motivate) learners to engage with the technical and informational subcontexts?"

A broad question like this might lead you to think about more specific issues such as:

- What are the current goals of the prospective learners?
- What are the possible future goals of the learners?

Also ask how the goals of the user are grounded in their relations with:

- Family

- Role models
- Peers

These are important sources of values as well as goals, and in some cases they provide an important context for learners to practice skills that they might be learning in the technical subcontext. For example learning to cook, repairing electrical devices, learning group management skills, all of these can be shared with the family at home.

Remember to consider, as we mentioned before, the goals of the community or enterprise. What are the goals of the community or enterprise? These may not be the same as the user's goals, but are likely to be related to them. How might the community's goals differ from the goals of the users?

Another question involves attitudes. What are the attitudes of the users toward the goals of the community or enterprise? Are they receptive? Do they have loyalties? Do they see a way of working out some kind of compromise or some sort of reconciliation of their goals with those of the community or enterprise?

The Technical Subcontext

When examining the technical subcontext ask a broad question such as:

"How might the capabilities of technical devices, systems, and methods facilitate achievement of goals?"

More specifically questions that might follow are:

- What aspects of the technical subcontext are most relevant to achievement of goals?
- What aspects of the technical subcontext are most difficult to learn?
- What do users already know about how to use the capabilities of the systems, devices and methods?
- What do users know about SIMILAR devices, systems and methods?

There are also questions about attitudes that should be examined. For example:

- What are the attitudes of users toward the technical subcontext?
- What are the attitudes of users towards their ability to take advantage of the technical subcontext for their own goals and purposes and those of the community or enterprise?

Considering Similar Systems, Devices and Methods: Accessing Prior Knowledge

Several years ago some students did a special project where they designed instruction to teach senior citizens how to use VCRs more effectively. They explored the question of how prior knowledge of similar systems could help the senior citizens to learn about VCRs. The students mistakenly assumed that prior knowledge about cassettes would be useful in helping the senior citizens understand how VCRs work. It's a plausible assumption. There are substantial analogies in the way the two systems work, in terms of understanding how the tape travels and how a counterlocator works and so on. However, it turns out that people over the age of 75 are not as acquainted with cassettes as teenagers and young adults. That particular possibility didn't work out. Despite the failure of the use of prior knowledge in this example, prior knowledge should be investigated. Also remember that prior knowledge can work for or against the instruction.

Another example of prior knowledge influencing learning would be word processors. Many learners who are beginning to use word processors have substantial experience using a typewriter. These learners might want to insert a return at the end of every line. This would be inappropriate because word processors wrap their lines. On the other hand, those learners may have substantial keyboarding experience. Their use of the keyboard may be highly automated. The keyboarding automation gives them an advantage because they do not have to devote as

much attention to the keyboarding activities as other learners, who might in fact be more technically sophisticated when it comes to the use of computers.

These are typical issues that should be explored as you try to understand what learners already understand about the technical subcontext, or what they understand about domains that are similar to the technical subcontext.

The Informational Subcontext

A richer range of opportunities and possibilities exists for information access than ever before. Many software applications are now distributing support materials primarily on CD-ROM. For example, manuals did not accompany recent distributions of Microsoft Word, they were considered optional, but the material was included on a CD-ROM. As mentioned previously, this poses a problem because learners need to have a much broader range of literacy or access skills if they are to become more effective at learning to learn.

An overarching or broad question to ask about the informational subcontext is:

"How will users access know-how and data that might help them to use the technical system to achieve their goals or those of the community?

More specifically, you should inquire about:

- The general education and literacy levels of our prospective learners or users
- The user's ability to work with: books and manuals, performance support systems, coaches and supervisors, tutorials and instruction

And you'll need to consider attitudes (again).

- What are the attitudes of users toward the informational subcontext?
- Do they see the informational subcontext as supportive?
- Do they see the informational subcontext as a set of obstacles?

To answer these and other questions you need to conduct an Initial Analysis of Problems and Opportunities.

Use the Bb arrow to advance to the next step in this I-CARE module - advance to the **Extend** segment.

Extend

Designing a Classroom Environment

This article describes an attempt to design a classroom environment in which the technical subcontext (economics and math) were linked with goals and values originating in the sociocultural context.

Excerpts from

Allen, B. S. (1992). Constructive criticisms. In T. M. Duffy, & D. Jonnasen (Eds.), *Constructivism and the technology of instruction: A conversation*. Hillsdale, NJ: Lawrence Erlbaum Associates. (ISBN 0-8058-1272-5). Please cite the original.

Constructive Criticisms

Instructional Intentions

Most of the constructivists in this book take positions that are not inconsistent with the view that instruction implies:

1. intentions to promote development of certain capacities and skills in learners,
2. assessment of some type of outcomes or results and,
3. methods which are believed to increase the probability that the intentions will be fulfilled.

For example, an explicit but general goal in most constructivist proposals is to promote flexibility in understanding--the ability to adopt multiple perspectives of a domain and to use this ability to negotiate with others about alternative interpretations. Not one of the classicists expresses frank disagreement with this goal, but it is not always clear how they view its importance relative to other instructional goals such as meeting ?the pragmatic requirements in a given training situation? (Reigeluth, p. 35); ensuring that children and adults ?earn a living and function in society? (Merrill, p. 51); or promoting the ?mastery of pre-determined skills? (Dick, p. 42).

However, as Duffy and Bednar, (p. 13) note, Merrill has been emphatic in other writings: that developers of most instruction, especially automated instruction ?explicitly [desire] that the learner adopt the meaning intended by the developer, and not reach a separate and personal interpretation of that meaning.? Many constructivists would argue that this is a serious, though unintentional, indictment of classical approaches to design.

The assertive constructivists[1] frequently express opposition to prespecification of learning outcomes, and they explicitly argue for negotiable learning outcomes. A central concern in their critique of classical instructional design is that its formal descriptions of outcomes tend to

emphasize execution of predetermined responses and action sequences. They emphasize instead, a capacity to engage in construction of purposeful actions or ?plans? (Suchman, 1987) in response to a variety of situations (Duffy & Jonassen, Chapter *; Spiro, et al., Chapter *). Similar criticisms have long been part of debates about instruction. Opponents of instructional objectives in particular, and of classical design in general, have often argued that indexing measures of achievement to performance-oriented objectives promotes development of narrow and inflexible ?skill sets? which are not easily transferred to new situations.

Merrill has argued that ?most instruction, particularly most uses of automated instruction, concerns transferring, as effectively and efficiently as possible, previously determined interpretations? (cited in Duffy and Bednar, p. 13). This is probably true, but it may also partly explain why, as Dick notes, classical design has played such a paltry role in shaping the American public school system. It also helps explain why, for reasons well described by Spiro, et al. , classical design has had relatively little impact on education in the professions, and why it is resisted in the arts and humanities. Classical design is still workable in many situations, but it may have a declining range of utility in a future where flexible thinking and openness to multiple interpretations will be perceived, more than ever, as critical faculties.

Like Dick (p. 44), I was surprised by a dearth in the ?ID? literature of formal definitions for instruction. My dictionary of etymology (Onions, 1966) was more illuminating. It traces the verb instruct to Latin for instruere: to set up, furnish, fit out, teach. However, reading more closely, I found what I thought was an ancient and useful metaphor: the root **struere** means to pile up, to build--while the prefix can apparently be taken to signify inside, thus to build within. To remember this meaning would be to remember that, ultimately, instruction cannot occur unless it occurs inside people?s heads and that no amount of external activity or material can substitute for the existential fact that knowledge must be (re)created by each individual.

Integration of Constructivist and Objectivist Approaches

Can objectivist and constructivist methods be reconciled or integrated? To some extent. Let me illustrate briefly with a case study from personal experience.

As a teacher, I experimented with adoption of techniques from the open classroom movement, transplanted from England. I studied Piaget and Montessori, and as a graduate student I developed science curriculum materials in both the BIG and WIG traditions described by Perkins . But like many classrooms, mine was outrageously disrespectful of ideological camps--guided by pragmatism and serendipity. My pedagogy was eclectic (I prefer the term ecological) because my allegiance was not to educational methods per se but to a learning community whose population just happened to be (mostly) children. Let me illustrate this approach with a brief case study that describes how constructivist learning can be supported by mastery-oriented instruction and coaching.

From Behaviorist Beginnings to Negotiable Solutions

One year in the early 1970?s, my fifth-grade students and I developed a micro-economy that seems similar to the one cited by Duffy and Jonassen in Chapter *. I initiated opportunities for basic experience with money by way of a token reinforcement regime (Sulzer-Azaroff & Mayer, 1977): students could earn ?razzels? by reading books, by completing a quota of math assignments, or by simply working quietly during study sessions. They could spend razzels on relatively scarce privileges or resources such as visiting another class, going to the library, having lunch with the teacher, or buying the right to be team captain during ?PE.? I used behaviorist methods, but I also was conscientious in working with the students to shift the focus of reinforcement from extrinsic to intrinsic. In the early phases, students earned money for silent reading. Eventually, after reading became a preferred activity, it was shifted to status as purchasable privilege--an application of the principle that contingent access to preferred activities can be used to reinforce less-preferred activities (Premack, 1959).

Eventually this quasi-feudal regime (with me as a sort of lord of the manor) developed into a complex, vibrant, and real economy driven mostly by activities during recess, after school, and during brief periods of designated

class time. As problems arose, I advised students and they conducted research on how to borrow possible solutions from the ?real world.? Loss and theft of razzels led to a kind of bank box where students could deposit their money. From the inconvenience of cash withdrawals grew a checking system. From the desire to exchange goods and services with students in another micro-economy came bi-weekly auctions in which one currency could be bought with the other. And so arose a fairly wide range of social, economic, and even ethical phenomena: stores, advertising, weekly auctions of ?junk? from home; taxes and bankruptcy; the rise and fall of syndicates and partnerships; systems for dealing with embezzlement, counterfeiting, and black markets. (We had to engrave the tokens to discourage counterfeiting.)

This was primarily a problem-oriented social enterprise in which the perception of the students was that the outcome of the enterprise really did matter and that the outcome was dependent on their developing the knowledge and skill to solve problems at hand. There were possibilities of ?real? failure (not having enough money to buy supplies), even catastrophic failure (losing a business), and there were possibilities for real triumph. The enterprise became an enormous dynamo of skill development for most of the children involved; the level of passion often ran very high. There was sustained effort and real sacrifice. In my experience, many children in our culture only experience this type of commitment to learning in the context of sports and video games.

One of my goals in managing the mini-economy was to provide opportunities for students to practice arithmetical operations in the context of realistic problems. However, I felt I could not safely assume that adequate practice would occur without formal regimes for tutoring and coaching. I adopted a technique for training students based on arithmetical ?movements per minute? to track the development of speed and accuracy in arithmetic facts and the ?debugging? and ?compiling? of various algorithms.

We charted the number of discrete operations each student could correctly perform in one minute daily using semi-log graphs (to emphasize progress during the early phase of the students? learning curve). While students worked at their own pace in individualized math workbooks to prepare for the next day?s test, I spent my time scoring the daily ?mpm? results and tutoring students with individual problems. I went over the graphs (kept in a private folder with daily test items) periodically with individual students and we reviewed their past performance and goals for improvement.

I think the mini-economy was meaningful to students not so much because of a correspondence with the larger (grown-up) world, or from a promised advancement of skills, or even from extrinsic rewards. The ground of authenticity lay in a coherent environment that presented a range of opportunities and challenges in which members of a community could assume different roles and learn through interaction and negotiation about how others perform their roles.

One way in which this type of collaboration (and competition) affords opportunities for learning is that children become aware that others are learning something different and that the social enterprise demands that they understand that other perspectives exist. Contrast this with individualized project-based assignments in which students each work separately on different projects (collections, art, science experiments); the need to understand what others know is hardly compelling.

Ensuring Mastery

Reigeluth points out that collaborative learning as described by Cunningham does not ensure that everyone will achieve the same level or type of mastery because the unit of analysis for assessment is the group rather than the individual. Mastery-oriented regimes, which are usually designed to ensure convergence in performance, rely on prespecified samples of the knowledge domain developed by the designer. Such sampling may balance broad summaries with in-depth elaborations, but the trade-off between depth and breadth can never be avoided in learning; mastery regimes merely ensure that it will be fixed by designers. Since the regime controls encounters with the domain, the children?s experience of learning based on situational necessity (requirements of the social enterprise) is restricted.

These historic limitations of classical design have been partly addressed by learner control regimes, personalized systems of instruction (Keller, 1968), and other strategies for individualizing learning. Often the undesirable

side-effect of such techniques is to teach that knowledge of a domain is fundamentally asocial rather than an emergent property of communities in which no single individual possesses comprehensive understanding. ?The practices of contemporary schooling deny students the chance to engage the relevant domain culture, because the culture is not in evidence? (Brown, Collins, & Duguid, 1989, p. 34). Thus it is not surprising that many Americans are apathetic towards lifelong participation in learning communities.

The token economy illustrates one way to build constructivist environments. The reinforcement regime established a basic level of meaning for money, but it was only an initiator for much more complex understandings determined by negotiation and experimentation and through formal rules and algorithms. Understanding evolved from simple to complex as the number of variables in the economy increased. Rieber (1991) has described a somewhat different approach for using ?variable stepping? to adjust the complexity of computer-based microworlds to learner capabilities.

Although the students performed thousands of arithmetic operations in the context of natural interactions of the economic community, the system supported them through systematic drills, individual assessment, and remediation. Some constructivists might consider the ?mpm? rehearsals to be another example of behaviorist zeal. I prefer to view them as exercises in automaticity (Shiffrin & Dumais, 1981) which freed attention for more complex and contextualized activity.

Classroom enterprises such as I have described are complex and require teacher-manager-coaches who can be bold, take risks, and above all commit themselves to use immediate context for the advancement of larger educational goals. They are, in other words, highly dependent on the personal characteristics of the teacher and probably difficult to replicate without the support of systems such as the Jasper series (Cognition and Technology Group at Vanderbilt University,
Chapter *).

Without appropriate expertise, constructivist enterprises tend to degrade into activity that does not promote generalizable or transferable skills. Degraded constructivist environments can trap learners in menial ?apprenticeships? that only serve short-term ends. Whole classes can be condemned to poorly planned experiments that exist primarily to fulfill the creative needs of the teacher. On the other hand, even carefully designed ?constructivist? learning environments can revert to objectivism when teaching styles are inappropriate--as when students are systematically led through criterion-based instruction on LOGO (Papert, 1980) or when impatient chemistry teachers prematurely prompt students for ?correct? answers during hypothesis formation (Savenye & Strand, 1989).

How are the above excerpts relevant to instructional design? For one thing, they build on fairly deep motives and values of the students. For example, the need kids have to belong to groups helped drive the development of a compelling social environment where math skills offered a way to accomplish the kid's goals. Consequently the students found that they wanted and needed to know their mathematical algorithms.

Instructional designers are frequently tempted to attempt to motivate students with superfluous ornamentation. "Maybe if more special effects were included students would be interested, or maybe if we had some really cool music and a dramatic scene they would be motivated." But instructional designers also need to examine issues at a deeper level. People are motivated, and particularly adults are motivated, when the ways and means available to them are related to their fundamental life goals and values.

The second possibility elucidated in the article is the concept of creating activities that build automaticity outside of formal class hours. Skill building activities were not occurring on class time. The rules were that monetary transactions could occur five minutes before recess and five minutes after recess. As a result half of the students stayed around during recess doing their transactions, selling things to each other, adding up their money. Much building of automaticity was off-loaded to non-class time.