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Aviva B. Dorfman
University of Michigan-Flint, adorfman@umflint.edu

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Introduction

Teaching and learning as complex, interactive, co-constructed processes (Bransford, Brown, & Cocking, 2000) make being a teacher a complicated task. Teachers' problems are often ill-structured, options for possible solutions are many, and the criteria for consideration of different solutions do not necessarily indicate a right or wrong answer. According to Richardson (2003), because constructivism is a theory of learning and not a theory of teaching, the literature on constructivist pedagogy is sparse about what constitutes effective constructivist teaching. The story of how I solved my own long-standing teaching dilemma about modeling contributes to the articulation of elements of effective constructivist teaching.

The Dilemma

I teach an undergraduate methods course in early childhood education for students pursuing an early childhood endorsement with their teaching certification. As part of the course requirements, I ask students to design a unit of thematic instruction. When I present this assignment and say that I have no format in mind for their projects, students look at me blankly. I can almost see them thinking, "OK. What does she *really* want?" And many request models and examples of units that have been created by previous students.

This seems reasonable. I can see how models and examples would appear to be helpful. Yet, as an experienced preschool teacher, I know what would happen if I painted a picture of a flower, posted it, and then opened the easel for children to paint.

Admittedly, the thematic unit assignment is a complex,demanding and daunting project. Some guidelines are necessary, and support to help students along the road of creation should be provided. Here lies my dilemma: How can I provide students with models without modeling "what I *really* want"?

Background Information

Course information. I view my courses as preparation for my students' professional lives, not solely as academic classes. Consequently, I design all the student assignments, in class and out, with my students' thinking in mind. The organization and presentation of material are exercises in synthesis and inherent aspects of the work to be done. If I organize their thinking by requiring a particular format or structure for the papers, I miss an essential opportunity for students to discover how they want to work, approach teaching tasks, and organize themselves to teach. I would be imposing my style—*my* thinking—upon them and depriving them of an opportunity to develop their own styles and ways of thinking as professionals. When reviewing their papers, I am much more interested in their thinking than in reading reflections of my own.

Because the assignment is large and easier to fulfill if the load is divided, I suggest that students work with a partner or in a group, to create discussions and share their ideas and experiences. I provide written descriptions of the requirements and how points will be awarded for the work, but I do not suggest

topics for their studies. During in-class group work, students use criteria for evaluating and selecting topics for study. This is deliberate, so that students might construct their own means for developing thematic instruction when they are teaching, if they choose to work in this way. I also decline to prescribe organization, format, or presentation style for the papers.

Levels of support are available, however. The project is too big to have only one shot at completion, so I build in opportunities for revision. The project is divided into two large parts, and students submit a first draft of each, before the final product is due. The due dates are staggered: students submit Part 2 after they receive feedback on Part 1 and comments on Part 2 before the final version is due. I provide evaluation criteria and enumerate the points and their allocation for each aspect of the project. The first drafts are not graded. Additionally, once we reach the time for this assignment, part of each class period is devoted to work on their projects. A general revision policy offers more support for this project. I grade in a criterion-referenced manner: students may revise any paper throughout the course, and if the revision fulfills the requirements of the assignment, the student receives full points for the work.

The thematic unit assignment. The strudents design unit plans (see Appendix A for the full assignment sheet) to address a week or two of instruction for infants up to 3rd grade students. In Part 1, I ask students to develop an overview of the unit and to write a rationale that cites early childhood and other, related literature. The overview consists of a representation of the whole unit that illustrates the unit goals, a brief description of all the learning experiences, identification of the domains of development addressed, and an integration of learning across the curriculum. The term domain refers to an aspect of children's learning or development such as personal and social development, language and literacy, mathematical thinking, scientific thinking, arts, social studies, or physical development. Students choose how to represent their overviews.

In Part 2, students develop detailed plans for four learning experiences. These are not limited to whole group lessons, circle times, or teacher-directed activities. A plan could describe, for example, the books in the book corner, the materials at the texture table, the construction toys available, or what the dramatic play area will consist of during this period. Each plan must include a definition of the learning goals, the performance standards addressed, the domains of development in which children will be engaged, a justification for the intent for this learning experience that addresses why it is appropriate for these children at this time, adaptations for individual learners, and assessment methods. Students also identify the materials to be used, the timeframe, and aspects of the classroom organization, as well as describe how they will introduce the experience to the children and what children will do during this experience. They include connections to other learning activities in the unit and plans for follow-up experiences.

From Dilemma to Solution

The problem. During the first terms I taught this class, when we discussed the options for the representation of the whole unit in Part 1, I described how a table, web, outline, or flowchart could be used to depict thematic units with all the information, but was reluctant to provide examples. Almost inevitably, if I sketched something on the board to illustrate my thinking, I saw students avidly copying my sketch. I found this disconcerting. Because their topics of study and the ages of the children varied, I did not wish to show them "one right way". Sensing my ambivalence, students were confused by my directions. I recognize now that they found me unclear because I said the presentation was up to them, but then I modeled a single organization and different formats. I was unaware of this internal inconsistency.

I discovered later that I had followed a particular logic for organizing ideas. I have worked for years on developing and teaching a system of performance assessment; consequently my thinking was deeply tied to

domains of development. I always envisioned presenting the unit by domain (or subject), listing the experiences, and showing how learning is integrated across the curriculum by cross-referencing the learning experiences between domains. I could imagine using any visual format to represent the same organization—as a choice of inclination or aesthetic taste. Consequently, my directions claimed to leave the format open, but my examples described a single option. I could see how unclear and confusing the students found my assignment, but I was only dimly aware of the reasons. Sensing the students' frustration, I never felt satisfied with the process.

The light goes on. During my third year teaching the course, a brave group of students took me at my word and presented their thematic unit in a profoundly different way. When I received their first draft, I looked for the unit to be broken down by a description of the learning experiences in each domain, wondering, "What will children be doing that supports their personal and social development? What will they learn about this theme through activities using language and literacy?" However, I did not find their unit laid out in this way. They had divided their topic—a third-grade study of the Great Lakes—by content, listing four concentrations: history, trade, resources, and leisure. They presented their unit as a study of each of these aspects. Within each content area, they listed the learning experiences (activities, lessons, etc.) and showed the connections to domains of learning. I confess that at first, it was hard for me to find my assignment within their presentation. I reread their work with a deeper analysis, however, and found all the elements. This structure was interesting, and I was pleased by their innovation, but only in the following term did I realize the implications of their approach.

That term I taught the advanced fieldwork placement and seminar course for the early childhood students. Seminar students repeat the experience of creating thematic curriculum and implement their plans in their fieldwork classrooms. On the day that we devote seminar time to planning their thematic units, students work with one another while I meet with the authors of each project. One student was enrolled in both courses concurrently. For her, this was a completely novel assignment. I could see her furrowed brow and overwhelmed look as I worked with other groups. She engaged the help of the students beside her while waiting for her individual meeting with me. When I reached her, she presented me with a sketch of a web that represented her beginning thinking. It was organized by content. When I mentioned that a group had organized their project in this fashion during a previous term, the students who had just worked with her identified themselves as the previous group. We discussed their organizational thinking, and they showed me their current web. After seeing the third example, I suddenly realized the significance of what they were showing me.

Dual decision. Designing a representation of the unit as a whole required *two decisions*. Students needed to make different choices: the *organizational logic* and the *visual format*. Each could vary, depending upon the author's preferences (see Table 1).

When I saw three student-designed units organized by content, I realized that I had previously held faulty logic. Seeing two logics for organization allowed me to understand that there were potentially others. My default logic had always been organized *by domain*. These students' logic was by *thematic content*. An additional possible organization was organized by the unit's *learning goals*. Another was a *pragmatic logic* that would be informed by the schedule of the class. I could also easily imagine using the logic of *location* in the classroom, which would be determined by where in the room the activity would take place. Likely, there are others.

Any organizational logic could be depicted in multiple visual formats (i.e., curriculum web, table, outline). A flowchart could be used to show the development of the unit over time. The visual format or graphic representation itself was an aesthetic choice, governed by visual needs or ease of information retrieval for use in the classroom. One could easily depict plans for a thematic unit of study in the weekly

Table 1. Two Dimensions of Presenting Thematic Curriculum

Organizational Logic	Visual Format Possibilities
Domains of development	Web, chart, table, outline, flowchart
Learning goals	Web, chart, table, outline, flowchart
Thematic content	Web, chart, table, outline, flowchart
Pragmatics (class schedule, time)	Class schedule by day or week, outline
Chronology (unit development over time)	Calendar, class schedule, flowchart
Spatial location in classroom	Map of the class, table, chart, outline

schedule of a class. In fact, a number of the student interns in the fieldwork course had followed their cooperating teachers' methods and utilized the class weekly schedule sheets. I had accepted these for the seminar, without transferring the implications to the methods course. I could now imagine that students could also depict their units on a map of the classroom, by areas of the room utilized.

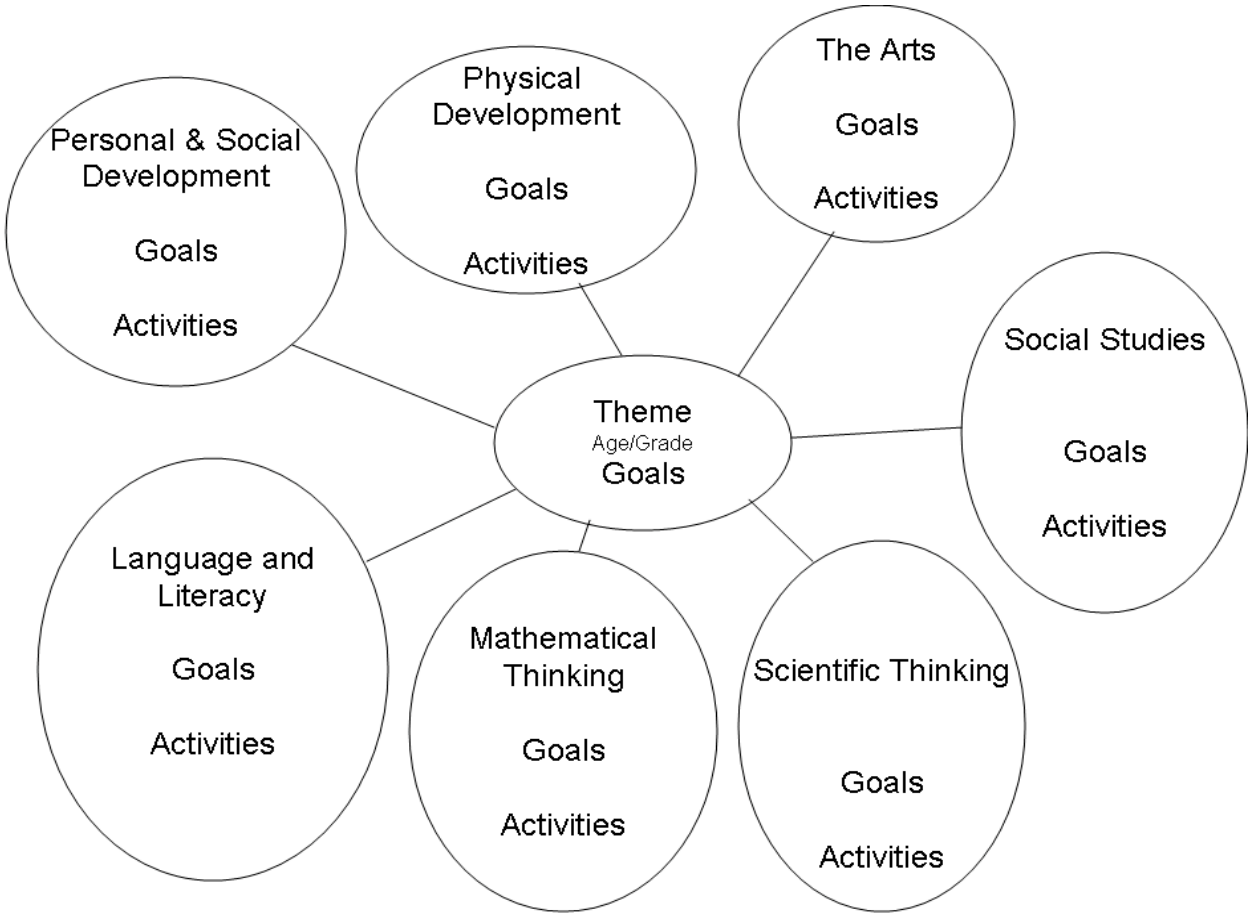
Solution. With the dual decision—choosing an organizational logic and selecting from the visual format possibilities—required by the assignment in high relief, now I could provide models without modeling. I created a set of handouts (see Figures 1 – 3) as examples of the different organizational and visual formats, without any topic, content, or age level of children implied. Multiple, content-free models, no longer close down options by modeling. Rather, they open the possibilities for students to make the choices most appropriate to them, their practices, and their thinking.

Discussion

Principles of creating open-ended models. Two principles are at work here. First, these open-ended models *illustrate the thinking involved* in synthesizing the material and creating a visual format for its presentation. Examples need to illustrate how to think about the problem—to *demonstrate the process of solving the problem* rather than provide "model solutions". Second, it is important to present *multiple* examples. Numerous examples concretely illustrate the existence of multiple options. By avoiding a single "model to follow", examples can provide inspiration for thinking, so that students might imagine new possibilities for themselves.

Models without modeling what I "really want". Models are a powerful means of teaching. In concrete ways they assist comprehension. According to Tharp (1993), modeling helps the learner because it provides information and an image that can serve as a performance standard. Models enable learners to visualize problems and to analyze them into their constituent parts (Ryder, 2004). When students are asked to represent their curriculum planning graphically in a visual form, they have the opportunity to synthesize their thoughts, express their thinking, demonstrate connections between content and process, and to create methods of planning and thinking about curriculum planning that suit their styles and philosophies. They engage in active learning and reflecting on their approaches to teaching and curriculum planning. By requiring students to synthesize information and represent their curriculum plans, the assignment engages them in higher order thinking and in finding solutions to ill-defined complex problems presented in the

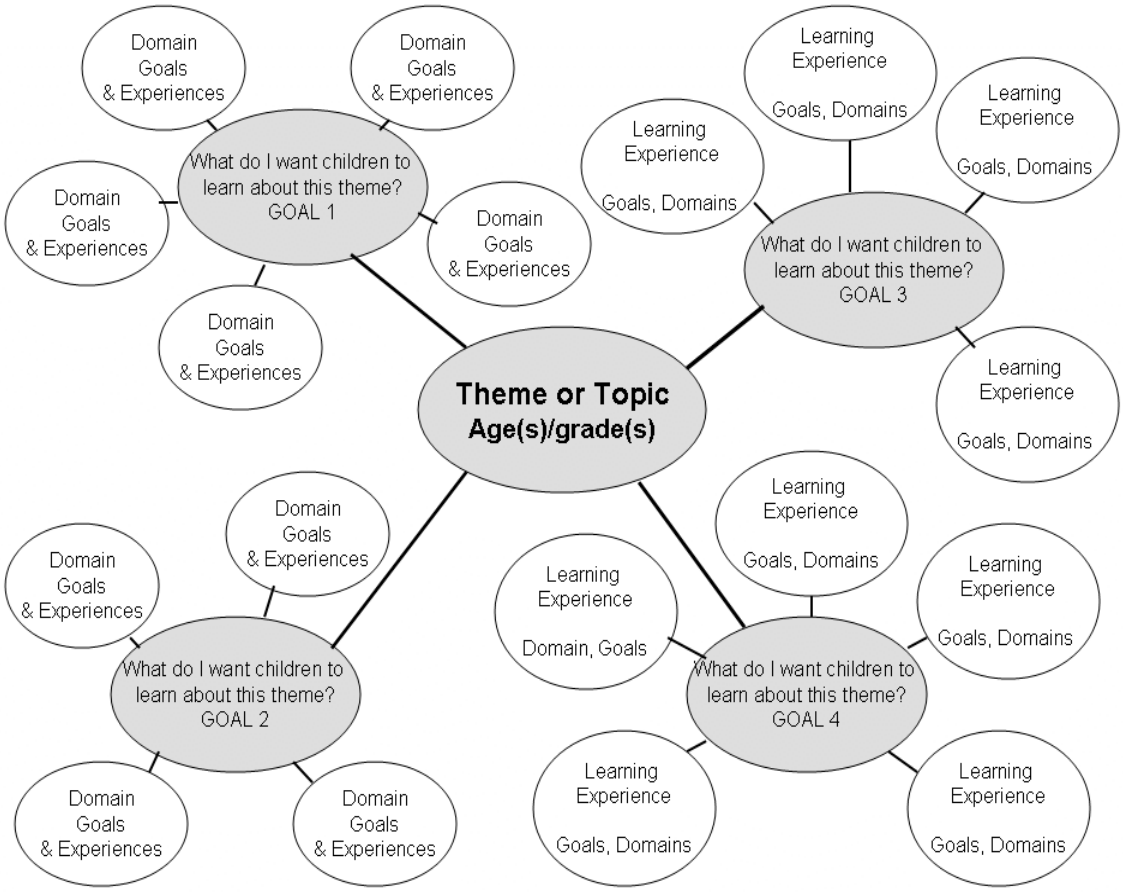
Figure 1. Class Handout Graphic: Thematic unit web, organized by domains of development (the previous "default" logic).



practice of teaching.

The models I now provide illustrate the dual nature of the task: choosing an organizational logic and selecting a visual format for representation. By providing cognitive examples, the handout acknowledges that these are choices to be made and encourages students to actively seek solutions and to make the choices that are best for them and the children. By calling their attention to the choice process, models encourage metacognition (Bransford, Brown & Cocking, 2000). By illuminating the underlying thinking processes, I support active transfer from this assignment to real-life teaching situations. *Models that support transfer.* Perkins and Salomon (1988) demonstrate how teachers cannot expect transfer to be automatic and call for ways to design instruction to support transfer explicitly. They describe the importance of articulating the principles involved to assist students in abstracting the concepts from one context in order to connect them to another. By making the thematic unit design process explicit and by specifying the kinds of choices students have to make, the assignment now supports transfer. The assignment: 1) takes into account the desired transfer; 2) constitutes instruction that shows the surface similarity between the contexts; 3) provides instruction that shows students the underlying abstract principles that connect the different contexts; 4) deliberately provokes students to think about how they approach tasks; and 5) helps students develop skills of learning for transfer (Perkins & Salomon, 1988). The models open up a conversation that moves the students beyond the course assignment to general discussions of designing curriculum. These conversations mediate abstraction and draw connections to teaching situations; they

Figure 2. Class Handout Graphic: Thematic unit web, organized by learning goals. Within each goal the activities are organized: on the left by domains (Goals 1 and 2), and on the right by the learning experiences (Goals 3 and 4).



create a bridge for transfer from an academic course into students' professional lives.

As teachers, my students will need to be able to plan instruction. They will need to define goals, choose what they want children to learn, and select activities that facilitate children's construction of knowledge and learning of stated goals. When my students become aware of the choices and processes used to make selections, they begin to view the problems as choices to be made that extend beyond the specifics of this or that particular assignment. Hopefully, this awareness of problem type will help them to recognize their own teaching dilemmas as similar. This will support their ability to apply selection principles, thus facilitating transfer from their academic preparation to their professional practices.

Conclusion

The students who organized their unit differently taught me a way to accomplish more of my constructivist teaching goals. The current models fulfill two principles important to constructivist teaching: 1) they model the process of solution but do not provide "model solutions"; and 2) they concretely show multiple paths to solution. This allows students choices and provides the possibility of creating new solutions to their own design challenges. The models encourage students to view the assignment as a type of problem. When they know the type of problem they are confronting, they can evaluate their purpose in order to select the most appropriate solution and recognize new problems. The models thereby provide a metacognitive frame for their work as the principles of what students have learned become transferable to new situations.

Figure 3. Class Handout Graphic: A sample blank Toddler Room scheduling sheet. This form is modeled on the schedule for the early childhood center toddler room; I retained the heading because many students were familiar with this form.

Theme: _____ TODDLER ROOM ACTIVITY PLAN Week of:_____

Vocabulary:		MONDAY	TUESDAY	WEDNESDAY	FRIDAY	THURSDAY
Time 1: CIRCLE TIME: (Singing songs, fingerplays, story time)	Focus:					
	Activity:					
Time 2: LEARNING CENTER: (small group time)	Focus:					
	Activity:					
Time 2: LEARNING CENTER: (small group time)	Focus:					
	Activity:					
Time 2: CREATIVE EXPRESSION: (art, sensory, computer)	Focus:					
	Activity:					
Time 3: OUTSIDE/GROSS MOTOR: (Buggy ride, Playground Multi-purpose room)	Focus:					
	Activity:					
Time 4: MUSIC & MOVEMENT: (dancing, instruments)	Focus:					
	Activity:					
Time 5: AFTERNOON PLAN: (Centers, Outside, Creative Expression &/or Computers)	Focus:					
	Activity:					

I found a way to create models that facilitate students' construction of knowledge about teaching by calling upon them to investigate, represent their thinking, and reflect upon their processes in the discussion of their plans (Bickart, Jablon & Dodge, 1999). By modeling teaching methods, we teach in ways people learn (Bransford, Brown & Cocking, 2000). By not having students reflect my thinking back to me, I engage them in constructivist learning and model the ways I would like them to approach instructional challenges.

Epilogue

Ryder writes, "The value of a specific model is determined within the context of use . . . A model should be judged by how it mediates the designer's intention, how well it shares a work load, and effectively it shifts focus away from itself toward the object of the design activity" (Ryder, 2004). By these criteria, the modeling principles that solved my dilemma created a generative framework for my teaching. I also teach a graduate research seminar designed to help in-service teachers develop their ability to use research skills to improve their own practices. The students, all certified teachers, are required to design and conduct a research project based on their own practices. When we reach the writing phase, students often request models of previous students' projects to help in structuring their papers. I bring examples and ask students to extract the headings from the texts and list these as outlines on the board. Together we examine the relationships between title, content, research questions, methods and compare the authors' choices and the structures of the papers. This exercise models ways of thinking about structure without modeling a single correct structure for a finished research study.

References

Bickart, T. S., Jablon, J. R., & Dodge, D. T. (1999). *Building the primary classroom: A complete guide to teaching and learning*. Washington, DC: Teaching Strategies and Heinemann.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind,*

experience, and school. Washington, D.C.: National Academy Press.

Bredekamp, S. & Copple, C. (1997). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8* (Revised Edition). Washington, D.C.: National Association for the Education of Young Children.

Dichtelmiller, M. L., Jablon, J. R., Marsden, D. B., & Meisels, S. J. (2001). *Omnibus guidelines: preschool through third grade* (4th Edition). NY, New York: Pearson Education.

Perkins, D. N., & Salomon, G. (1988). Teaching for transfer. *Educational Leadership, 46* (1), pp. 22-32. Association for Supervision and Curriculum Development.

Richardson, V. (2003). Constructivist pedagogy. *Teachers College Record, 105*(9), pp. 1623-1640.

Ryder, M. (2004). *Instructional design models*. Retrieved March 10, 2006, from http://carbon.cudenver.edu/~mryder/itc/idmodels.html.

Tharp, R. (1993). Institutional and social context of educational practice and reform. In E. A. Forman, N. Minick, & C. A. Stone (Eds.), *Contexts for learning: Sociocultural dynamics in children's development* (pp. 269-282). New York, NY: Oxford University Press.

Appendix A

The following is an adaptation of the full assignment sheet that I currently use in the methods course. The text includes changes that reflect the solution to the modeling dilemma.

Integrated Thematic Unit

This assignment has four parts and is worth 40% of your grade for the course. Each student will work with a partner or group to develop an integrated thematic unit for infants, toddlers, pre-primary, kindergarten, or primary children (grades 1-3)

Part 1: Theme, Web, & Rationales: First Draft DUE: _____ (15 points)

Theme or Topic:

List the theme or topic of study you chose

Identify the age level(s) or grade(s) of the children

Identify the learning goals for the unit as a whole: What do you want children to learn *about the theme or topic* from this unit?

Unit Overview: Web or Curriculum Plan:

A: Develop a curriculum overview:

1) Demonstrate or illustrate *how you will integrate the theme throughout the curriculum*. The plan can be presented as a web, table, outline, or other graphic representation of your choosing.

2) Within each domain identify at least two goals, objectives, purposes, or concepts to be attained by children through studying this theme. List 3-5 activities or learning experiences that you would include. Choose activities that support the learning you state as your theme or unit goals. If you organize your unit by learning goals, content, or class schedule, for each activity or learning experience show what domains and specific learning goals within the domains are being addressed. Address 2-5 broad learning goals or content areas for the unit. List 3-5 activities or learning for each learning goal or content area and address all domains across the curriculum.

B: Scheduling one day's activities:

How much of your unit plans would you accomplish during one day?

Block out one day during the unit, using the schedule you designed previously, or devise a new schedule for this purpose. List materials that will be available, content at centers, book titles in the book corner and to be read aloud that day, etc. Identify the parts of the schedule that appear on your web or curriculum plan. The idea is to envision what one day of instruction would look like during a longer unit.**Individual Rationale:**

Develop a rationale for the theme or topic. Use course readings, texts from other education courses, and/or additional early childhood literature to support your plans, and discuss what compels you to the topic. Project partners may develop the rationale together and cite the same literature, but each must write the rationale in his/her own words.

Four guiding questions for this rationale:

What do you want children to learn *about this theme*?

Why is this important to learn? Use your knowledge of child development, Michigan Curriculum Framework, other standards, etc.

Why is this theme developmentally appropriate? Cite theoretical perspectives on early childhood practice (Developmentally Appropriate Practice (DAP) (Bredekamp & Copple, 1997), Building the Primary Classroom (Bickart, Jablon & Dodge, 1999), etc.), and discuss how you have designed your study to fulfill those principles and put them into action.

Why do you like this topic and find it compelling? Discuss personal interest and passion, ease of integration across the curriculum, accessibility of resources and materials, etc.

Part 2: Activity Plans, Learning Goals, & Justifications: 1st Draft DUE: ___ (20 pts.)

A. Activities and Goals: Develop fully expanded plans for four of the activities from your unit. Choose these four from varied domain areas across the curriculum.

Plans include:

Specific goals or objectives for the activity or learning experience planned

Organization of the activity: small group, whole group, individual; choice or assignment; where it will occur in time and setting

Introduction to children (consider when it will occur during the thematic unit, whether it is a novel or repeated experience, a culminating experience, etc.)

Materials needed (list specific book titles, songs, CDs, materials, etc.)

Description of the activity: what children will actually be engaged in doing

Possible follow-up activities and/or connections to other (possibly previous) learning experiences in the thematic unit

Modifications and/or adaptations for children with special needs [discussed in class]

Assessment: evidence you will collect to learn about children's learning and the success of the activities, and how you will collect and document it

i) Justifications: Justify your goals for each of the four activities, using the Omnibus Guidelines (Dichtelmiller, Jablon, Marsden & Meisels, 2001), DAP, and/or Michigan Curriculum Framework document for skills, behaviors, and learning in which children will be engaged. Answer the question why the goals you have chosen are appropriate for these children. What standards do they address?

B. Materials lists: List books available in the book corner; songs, finger plays, and poems recited and sung during the unit; materials available in centers around the room for dramatic play, science, math manipulatives, easels and art, writing, listening center, etc.; books, stories, and poems to be read aloud, and so forth.

Part 3: Presentation of one activity to children:

• For one activity out of the four, create actual materials to use, such as flannel board stories, game pieces, puzzles, etc. Present this activity to children, preferably in a group or classroom setting.

•Each student in the group must prepare and present at least one activity to children at the target age/s (in a classroom or other setting). You can divide the activity or experience into parts that each of you will present to the children on the same day, or you may present on different days (or places). Partners will observe each other and conduct a debriefing session at the conclusion of the activity (lesson, experience, etc.). The debriefing sessions should be viewed as an opportunity to discuss and analyze strengths and weaknesses in the activity and give each other feedback. If you present the activity alone, you may have the classroom teacher, day-care provider, or other adult present observe you and give you feedback.

Use the forms [included in the syllabus packet] to develop a brief critical analysis to submit that includes each partner's (or teacher's) critique and a self-evaluation and reflection.

Part 4: Thematic Unit and Evaluation Reports: Final Version DUE: _____
Revised documents: final webs, goals, rationales, schedule, activity plans, materials lists, evaluations. Prepare a 1-2 page summary of your unit plans (or a PowerPoint presentation) with the book, materials and resource lists to share with others in the class. **Present your unit to the class (5 points).**