L2LP: Learning to Lesson Plan

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Here at Michigan State University (MSU), we have a unique opportunity to add to the body of teacher education knowledge. A recent programmatic change in the microteaching experience during our undergraduate mathematics methods course may allow for an interesting look into factors that play a role in *pre-service teachers*’ (PST) lesson plans.

In 2011 and before, the microteaching experience involved mathematics PSTs teaching their methods student colleagues (typical for microteaching). In 2013, the microteaching students changed from peers to first year undergraduate students. Now, the mathematics methods students teach first year undergraduate students in an authentic teaching situation.

My research team is looking to see what differences emerge from these two sets of lesson plans. Specifically, we are looking to find changes PSTs made from their first draft to their final draft. The final draft was turned in after teaching the lesson and encompassed what actually happened in the teaching experience. My goal for this literature review is to give an overview of the field of lesson planning and lesson plan analysis, explain what is known about lesson plan work, and best situate our current study into the literature.

The purposes of this literature review are to provide a synthesis of the field of lesson plan research, to allow readers to see historical trends and patterns, and to find a place for our current project within the body of lesson plan research.

# Introduction

Clark & Peterson (1986) provided two conceptualizations of lesson planning. First, planning is a “set of basic psychological processes in which a person visualizes the future, inventories means and ends, and constructs a framework to guide his or her future action” (p. 260). Second, planning is “the things that teachers do when they say that they are planning” (Clark & Peterson, 1986, p. 260). These are interesting conceptualizations and together they provide cognitive and behaviorist ways of defining lesson planning. In earlier work, Peterson, Marx, & Clark (1978) suggested “theoretical models of teacher planning as a process of selecting educational objectives, diagnosing learner characteristics, and choosing from alternative instructional strategies in order to achieve certain learner outcomes” (p. 418). While this definition seems to encompass both the cognitive and behaviorist components of lesson planning, the range of these definitions should be the first clue that studying lesson plan and lesson planning is a complex endeavor. Coupled with the fact that lesson planning, itself, is a complex skill (see e.g., Johnson, 2000; May, 1986; Wild, 2000), the varying ways people have approached teaching, enacting, and studying lesson plans and planning is quite diverse.

## Why is Lesson Planning Important?

Morine (1973) argued that human interactions are unpredictable and the more interaction, the more uncertainty. Teaching is highly interactive. Teachers need to consider a number of alternatives and options when considering what they would like to have happen in a class on a particular day at a particular moment. Lesson planning provides a foundation from which teachers make these important instructional decision. Lesson planning can help mitigate ruts to increase student engagement (Morine, 1973).

If a teacher improves quality of planning, it will improve quality of teaching that follows the planning (Morine, 1973). Johnson (2000) argued that thoughtful planning creates better lessons, enhances learning and enhances teacher effectiveness (p. 72). It is easy to see the truth to these claims. Logically, better planning makes a teacher more prepared. Increased preparation allows a teacher to better teach the intended material or to better deviate as student thinking and needs would require the teacher to do. Better enactment and responses to student needs should make better teaching.

Reusser (2000) argued that teachers make many *microadaptations* throughout lessons. These microadaptations are teachers’ in the moment decisions that aim to tailor instruction to the needs of different learners (Reusser, 2000). Teachers do this in a variety of ways - organizational structures, manner in which information is presented, materials to guide problem solving, support materials, time, and feedback. While Reusser (2000) focused on measuring the in-action teaching, the necessary pre-requisite to making adaptations is having something to adapt: the lesson plan. In order for teachers to make these necessary microadaptations, they must have a plan from which to change.

Clark & Peterson (1986) also argued that lesson plans are important for the customization that teachers must make. Lessons plans allow teachers to meet the immediate and unique needs of their students by thinking about their students and writing and adapting curriculum and materials to better align with the particular students, their knowledge, and their needs (Clark & Peterson, 1986, p. 262). Because curriculum and textbooks cannot possibly be designed to engage every child, teachers have to use their important knowledge of students to bridge the gap between student and content (see e.g., Dewey, 1902; Hill, Rowan, & Ball, 2005).

## Why is Studying Lesson Planning Important?

As lesson planning is important for teaching, studying lesson plans and planning is important for researchers and teacher educators. Clark & Peterson (1986) suggested that little research was done on lesson planning prior to the 1970’s and others (see e.g., S. A. Hughes, 2005; Johnson, 2000; Warren, 2000) have argued the same is true more recently. Though scholars note little lesson plan research, in the field of education teacher thoughts and decisions are widely studied. This seems to indicate that teacher thoughts and decision are important notions to study. The logical progression is that studying the process and documentation that creates the foundation of these thoughts and decisions would also be important.

Clark & Peterson (1986) found that lesson plans fit into eight categories: weekly, daily, long range, short range, yearly, term, unit, and lesson plans (p. 260). This is significant for several reasons. First, it shows that when the words “lesson plans” are used, there are at least eight different images (or more) that teachers and scholars may hold. Varying mental images of lesson plans certain leads to different conceptualizations and descriptions of the planning which makes research and even collegial communication about lesson plans a challenge. When a teacher says “I am going to be lesson planning during my preparation period today,” the exact behaviors and thoughts are not clear from that phrase alone. Thirdly, the categories of planning also speak to the importance of lesson planning. Teachers have so many types of planning experiences they cannot be described in simple language.

Studying lesson planning has both theoretical and practical importance. On the theoretical side, models have been developed (see e.g., Clark & Peterson, 1986; Hunter, 1985; Smith, Bill, & Hughes, 2007; Wiggins & McTighe, 2005) that act as frameworks from which teacher behavior can be understood and explained. While this is interesting to scholars, it is the practical aspects that are likely to be more impactful for practicing teachers. The following explanation shows some of the practical findings that lesson plan research has found.

Shroyer (1981) talked about how little teachers anticipate unpredictable student performance before teaching a lesson (p. 21). More current research (see e.g., E. K. Hughes, 2006) provides evidence that teachers can be taught how to better anticipate student performance and thoughts. However, few in the mathematics education would think that extensive focus on student thinking during lesson planning is a norm. Additionally, Peterson, Marx and Clark (1978) found that research suggested that teachers focused more on content and less on objectives. Later work using varying models of teacher planning can and will show different teacher foci. These results open the door for further research into lesson planning.

## Function of Lesson Planning

Clark & Peterson (1986) found that lesson plans serve many functions for teachers. These functions are quite diverse and understanding the various ways teachers use lesson plans is both important and interesting.

Clark & Peterson (1986) found a myriad of functions such as: (a) meeting immediate personal needs (reducing nerves, finding a sense of direction, bolstering confidence, and increasing security); (b) providing a means to the end of instruction (helping teachers learn material, collect/organize materials, organize time and activity flow); (c) use directly during instruction (to organize students, get activity started); and (d) meeting administrative requirements (see also S. A. Hughes, 2005). However, the “most obvious function of teacher planning in American schools is to transform and modify curriculum to fit the unique circumstances of each teaching situations” (Clark & Peterson, 1986, p. 262). Themes of being prepared in terms of content, materials and mentally are clear throughout.

# Models for Lesson Planning

This section will focus on four models of lesson planning. Presented in sequential order, I hope to illustrate a progression from more rigid, linear planning based on teacher behaviors to more flexible and detailed planning based on student thought.

## Tyler Model

The Tyler Model was created in the early 1950’s and was used well into the 1980’s as the dominant method of lesson planning and lesson plan instruction for all levels of teachers and their planning (see e.g., Clark & Peterson, 1986; May, 1986; Warren, 2000). The Tyler Model is the pinnacle of forward linear planning. In this model, teachers specify objectives, select learning activities, organize learning activities, and specify evaluation (see Tyler, 1950 as cited in Clark & Peterson, 1986). May (1986) suggested that several factors make this particularly difficult for PSTs including their limited subject matter knowledge, the reality of school as a complex system, and personality and style issues. Additionally, when it comes to the actual sequencing, this method has been found challenging for PSTs when they are asked to specific objectives before activities (May, 1986).

In later work, many scholars found that teachers do not engage in strict linear lesson planning (see e.g., Clark & Peterson, 1986; Richardson, 1994). Specifically, Richardson (1994) observed that “teachers do not lesson plan in the linear manner prescribed in many teacher education programs” (p. 6). Suggesting that teachers develop personal planning methods and styles after leaving teacher education. While this is not a surprise, it does pose the question of how teachers make changes and if those changes are more effective that the model itself. Clark & Peterson (1986) found that teachers do not usually plan in linear fashion and specifically that most objectives are specified toward the end of planning. As objectives are focal issues for PSTs learning to write lesson plans, it is interesting that this particular component is changed when lesson planning is no longer supervised.

## Madeline Hunter Lesson Plan Model

Based on her philosophy that teachers are decision makers (Hunter, 1985), Madeline Hunter devised a seven step lesson planning guide that was intended to be generic enough to work for any grade level and with any curriculum (Hunter, 1985; Stallings, 1985). In this process, teachers: a) set the stage and activate prior knowledge with an *anticipatory set* to get all students ready for the lesson, b) state the lesson’s purpose and objectives, c) instruct in a series of conceptual blocks with nine checks for understanding, d) model, e) have a final check for understanding, f) provide guided practices, and g) if students passed the guided practice, they engage in independent practice (Stallings, 1985, p. 325). Hunter’s vision was that with a generic model, this type of lesson planning could be customizable to countless teachers in countless situations. However, she explained that the “model is deceptively simple in conceptualization and incredibly complex in application” (Hunter, 1985, p. 60).

Like much in education research and practice, Hunter’s method has received pushback and criticism. For example, Berg, Clough, Hunter, Sousa, & Lindauer (1990) argued that in science teaching this model is “not consistent with goals of science, not appropriate for every lesson, and contradicts important principles of science teaching” (p. 73). The generic that was intended to be a good thing – customizable – has been criticized for not meeting the needs of specific content areas. While some argued that the linear nature was inauthentic or difficult to use, Hunter argued that that it was not intended to be used as rigidly as to always to have include the seven steps the order presented and not necessarily liner in nature (Hunter, 1985). Hunter (1985) argued that the model is sound and it is misunderstanding the model that causes problems.

Many good things did come out of Madeline Hunter’s work. In providing common language from the generic lesson plan, Hunter allowed teachers and administrators to use common language in order for increased communication potential. Perhaps most notably is the significant shift from the Tyler Method in implementing checking for student understanding. In this the Hunter model, trying to verify that students are learning what is expected is taken into consideration. This change is a significant step toward current teacher education trends that expect teachers to focus heavily on student thinking.

## Backward Design

While Tyler never used the phrase *backward design* (or congruous *understanding by design*), he can be credited with the beginning of the idea of talking about student objectives. More contemporary work would likely encourage teachers to use backward design (Wiggins & McTighe, 2005). In backward design, teachers first “identify desired results” (what students need to learn), then “determine acceptable evidence” (assessments for those objectives or learning targets), and lastly “plan learning experiences and instruction” (Wiggins & McTighe, 1998, Chapter 1). While this still has a linear feel, it allows teachers to better match classroom activities with desired results and in doing this, teachers may be more likely to enact more fluid planning sequences. Conceivably the three larger chunks allow teachers to more effectively customize their plans and student needs. Backward design appears to have received much less push back than the Hunter model. Perhaps that is partly due to the fact that it considers teacher monitoring of student thinking much more than Tyler or Hunter did and that is where the field has moved in terms of values.

## Thinking Through a Lesson Protocol

*Thinking Through a Lesson Protocol* (TTLP) was designed to help teachers plan for high-level cognitive tasks and to help teachers move based *structural components* of lesson planning to deeper consideration of student thinking and how to extend it (E. K. Hughes, 2006; Smith et al., 2007). TTLP “provides a framework for developing lessons that use students’ mathematical thinking as the critical ingredient in developing their understanding of key disciplinary ideas” (Smith et al., 2007, p. 4). This model is partitioned into three sections: (a) selecting and setting up a mathematical task, (b) supporting students’ exploration of the task, and (c) sharing and discussing the task. Throughout these sections, questions prompt and drive teacher thinking and ensuing action.

The first section – selecting and setting up a mathematical task – involves the teacher determining objectives and being explicit about he or she desires for students to know. Smith et al. (2007) suggest that by “being clear on exactly what students will learn, you will be better positioned to capitalize on opportunities to advance mathematics in the lesson and make decisions about what to emphasize/de-emphasize” (p. 6). The Hunter and Tyler models also focus on explicit objectives. One question in this section is “what are all the ways the task can be solved?” (Smith et al., 2007, p. 7). Smith et al. (2007) suggest that this provides the teacher an opportunity to consider wrong answers and other answers students will provide with the intent of needing to rely less on *improvisational moves* throughout the lesson (similar to Reusser’s (2000) microadaptations). Considering ways in which students might struggle is a pillar of Shulman’s (1986) conception of *pedagogical content knowledge* (PCK).

The second section – supporting students’ exploration of the task – involves how the students work with and think about a particular mathematical concept. Again, TTLP asks teachers questions and in this section the questions center around ideas of what teachers will do if students are stuck, what teachers will ask students if they are either struggling or finish quickly, and how teachers will ask questions to engage all students. TTLP addresses student thinking along several dimensions. This framework helps teachers consider student thinking with what the students are doing (task), what the students are thinking (thought/learning), and how that thinking is related to behavior (classroom management).

In the third section – sharing and discussing the task – teachers are asked to consider how they will coordinate discussions, choose the order of solutions to the class (which stems from teachers having thoroughly considered all solutions in part 1), and what teachers will do the following day to continue to build on the learning and thinking. Section three promotes synthesis and sharing. It provides teachers a chance to formatively assess students to help make future decisions as well as determine if students are learning what is expected.

TTLP is a very thorough lesson planning tool. Written lesson plans, using the full format, are often upwards of 10-15 written pages in the MSU mathematics methods course. The creators of TTLP note that this is not a model or planning tool that was intended to be used in its entirety daily, but with periodic and collaborative use, teachers can improve on their ability to interact with student mathematical thinking (Smith et al, 2007). Smith et al. (2007) point out that TTLP has been used well by beginning teachers for help with considering student thinking and misconceptions even if it is not used in its entirety daily.

**TTLP Literature.** In a 2006 study, Elizabeth Koopman Hughes examined the written lesson plans (in TTLP format) of ten mathematics methods PSTs and measured how the PSTs attended to students' mathematical thinking before their Teaching Lab, immediately after their Teaching Lab, in the first semester of their supervised field work, and the end of the first semester of their field work. Hughes (2006) found significant growth from pre- to post- Teaching Lab suggesting that students developed new skills in lesson planning and attending to students’ thinking throughout that pre-service experience.

Specifically, E. K. Hughes (2006) found that in the first round of teaching (prior to instruction about student thinking), PSTs do not focus on student thinking. Therefore, much of methods class (Teaching Lab) time is spent on writing mathematical goals and identifying questions to ask students while they work. With this concerted effort/energy toward thinking about student thinking in the methods class, many PSTs made substantial gains in their scores, though about half of the PSTs still provided vague goals and were not able to think through what students will likely say/do (E. K. Hughes, 2006).

In addition to teacher education factors, E. K. Hughes (2006) found differences in PST attention to student thinking as it related to the level of cognitive demand of the task. Lessons created after the Teaching Lab (i.e. in their supervised field work) that were high cognitive demand were not statistically different that the Teaching Lab suggesting that PSTs were able to maintain their attention to student thinking, but type of activity impacted how PSTs responded (E. K. Hughes, 2006). E. K. Hughes (2006) then found that PSTs were more likely to consider student thinking if it was a high-level task (compared to low level task). Specifically, E. K. Hughes (2006) found that beginning teachers approached different types of classroom activity (lecture vs exploration) in different ways when it came to anticipating student thinking, though this relationship was not causal. New teachers often struggle with noticing student thinking and although the mathematics community values noticing student thinking, it does not often implement those ideals (E. K. Hughes, 2006)

These results might lead one to question if TTLP is applicable for low-level tasks in teaching mathematics. E. K. Hughes (2006) argued that TTLP *is* appropriate for low-level cognitive demand tasks and in low-level tasks there is less variety of student thinking and so it should be easier to predict student thinking (p. 205) however this attention may not have a significant of an impact on student learning (p. 206).

## Summary of Models

From the previous discussion, the progression of lesson plan models is an interesting snapshot of the educational values over time. From teacher behavior to checking for understanding to attending to student thinking, these shifts are important. This change over time also explains why studying lesson planning is difficult as we have different models to contend with in different eras or different locations. As can clearly be deduced, different models impact the way that teachers think about and enacted lessons. So, next I would like to address issues about how teachers learn to plan lessons.

# Learning to Lesson Plan

I begin this section with three illustrations of teacher planning. In her 1981 study, Shroyer worked with three teachers: Ralph, Martha, and Zelda (pseudonyms). Shroyer (1981) described Ralph as a "typical math teacher," Martha was the “opposite of Ralph/closest to NCTM reform teaching” see (NCTM, 1980), and Zelda was a mix between the traditional and reform (p. 110). Shroyer (1981) examined the planning practices of these teachers. While these descriptions do not represent all teacher planning scenarios, these descriptions provide some illustration of how planning processes can emerge from different teachers.

The most traditional of the three, Ralph planned his unit based on the textbook and used pages and problem sets as his organizing structure. He read the textbook before teaching each lesson. Every activity was planned. He did not assign the more challenging questions. Ralph believed that mathematics is repetitive and memorization. (Shroyer, 1981, p. 84).

Martha began with required objectives, determined what objectives students were already familiar with, and then used that information to guide her planning. Martha did not use a text book. She had specific plans for about half the class activities and the other half was dedicated to responding to student suggestion and things that needed to change. Her plans were brief comments about tasks students were to perform. There was no unit test and Martha used student performance as formative assessment to inform the next day’s lesson. (Shroyer, 1981, p.73-74)

Zelda listed topics she intended to cover. She used ideas from the textbook, but did not use the book when she felt the book was confusing or not helpful for the students to learn. Sometimes Zelda’s plans were incredibly detailed, others they were much less so. For the first week, when she used the textbook minimally, Zelda’s plans were more detailed than Martha’s and she completed all problems and examples. Later, when she used textbook to a greater degree, her plans were much less detailed. (Shroyer, 1981, pp. 79–80)

While these three images do not provide all possible ways of planning, or intend to do so, they do offer glimpses into different ways in which teachers plan for lessons. These differences naturally lead to questions about how they learned to plan in the ways they did? How did their background (education, training), beliefs, resources (textbook, supplies), and students impact their decision making processes? To gain insight into these differences, I turn to previous literature to help understand factors that lead into how teachers learn how to lesson plan.

## Conceptions of Planning

When working with PSTs, Johnson (2000, p. 174) writes the following on the board:

*Teaching = knowing + planning + doing + reflecting*

He explained that PSTs often only think teaching is *doing*, and the PSTs he works with do not consider the other three portions of this equation. Perhaps the fact that planning is not as visible, done before class, and/or enacted so skillfully, that people (PSTs and others) believe it is not a component of teaching that demands attention. Wrapped up in this conception is the idea that teachers can “wing it” while teaching (Johnson, 2000). Separate from the fact that lesson planning is challenging in and of itself, perhaps part of this comes from conceptions that it is unnecessary to teaching.

## How do Teachers Learn to Lesson Plan?

How teacher educators, mentor teachers, teacher coaches, university field placement supervisors, and administrators help novice teachers learn to plan is a complicated, and not agreed upon, process. While some colleges and universities may be very aligned in lesson plan philosophy, others are quite varied. The result is that the school, the program, and the instructor have influences on teacher lesson planning, and that is just from the university. Once the host school, teacher, and resources are layered in with the PST or novice teacher’s own background, the number of variables factoring into how teachers learn to lesson plan is immense!

Scholars have many different recommendations and suggestion for the teaching of lesson planning. Morine (1973) suggested PSTs be given multiple rounds or opportunities to consider assumptions and change the conceptions of how they might respond to students and plan for teaching (p. 83) and she argued that early in career teachers need training in developing more than one plan for handling a situation (p. 136). PSTs should be given opportunities to write plans and think about how they would react to situations. Their thinking and planning should be appropriately challenged and questioned. This should allow the PSTs opportunities to revisit their thinking and writing to amend and change, not only their work, but their thoughts and ideas. In doing this, PSTs should be guided (like the TTLP does) to thinking of multiple responses and ways in which activities and questions may be responded to and answered.

Clark & Peterson (1986) argued that “training novice teachers in use of a version of the rational model [e.g. Tyler model] provides them with an appropriate foundation for developing a planning style compatible view with their own personal characteristics and with the task environments in which they must teach” (p. 268). So, while even though teachers learn to plan using a given model, Clark & Peterson (1986) suggest that personal style should also be a consideration and allowance for teachers in developing this skill which has been documented to happen.

In more recent work about how teachers might leverage the potential of student error, Bray (2013) identified three steps that teachers should use. Bray (2013) suggested that teachers first, identify the flawed and correct solutions that will be focused on in the public discussion, then determine the order and format the solutions will be shared, and finally determine the mathematical points to be made with each (p. 149). This is similar to TTLP protocol and illustrates the movement in current educational thinking to capitalize on student thinking which includes student mistakes.

While this snapshot of how teachers learn to lesson plan does not offer a complete picture, these studies show the importance for PSTs to have multiple opportunities to challenge and change their thinking, develop systems that fit with their personal style, and learn how to anticipate student thinking during a lesson.

## What Influences Teacher Lesson Plan Learning?

Beyond the issue of what lesson planning is and how it might be learned, Warren (2000) considered several factors that influence the process of teacher lesson planning. He found the following to be the major influences: (a) teacher experience, (b) school schedule, (c) movement of students, (d) availability of materials, and (e) class disposition (Warren, 2000).

Warren (2000) explained that PSTs and novices often rely heavily on how they were taught to lesson plan which can often be a step-by-step experience. However, Warren (2000) found experienced teachers reflect on prior lessons and pull successful aspects of those lessons into plans for future lessons. Like many things in teaching and other professions, previous experience provides a rich body of knowledge. For novice teachers and PSTs, with little lack of experience, depending on teacher education experiences is the logical place to go for this information.

Warren (2000) addressed a variety of pragmatic factors for planning which may be more salient for teachers than theoretical ones. Schedule factors (what time was allocated for what subjects) and constraints of time play a role in teacher planning. Movement of students in and out of class for remediation, extension, and specials is another consideration for teacher planning (Warren, 2000) and while this may play more of a role for elementary general education teachers, the larger issue of what students are present and what students are not present (and therefore are not participating in a lesson) is a consideration for all levels of teacher planning.

Warren (2000) also discussed the issue of resources as related to planning. Availability of instructional materials such as textbooks and book activities (p. 39) is incredibly important for teachers. In the world of Web 2.0 technology, technological resources including materials (devices and programs) and the underlying support systems (internet connection and technology support personnel) impact teachers’ lesson planning.

Finally, and arguably most important, Warren (2000) considered the students, their interests and abilities, and the class disposition (p. 39) as vital components of lesson planning. Surely, who the student are and what they bring to class are issues that influence teacher lesson planning. S. K. Hughes (2005) also wisely addressed the incredibly important role that lesson planning plays in the education of marginalized students. Teachers have an essential role in planning in ways that address needs of *canary groups* (S. A. Hughes, 2005, p. 108)

Reynolds (1992) said

competent teachers create lessons that enable students to connect what they know to new information.  In order to create good lessons, teachers must know their subject matter in a way that enables them to explain it to students.  Teachers must also know their students in ways that allow them to tailor the subject matter, curriculum, materials, and instructional strategies to the students. (p. 10)

The role of *subject matter knowledge* (SMK) or *content knowledge* (CK) if a factor in several models for teaching, PCK and *mathematical knowledge for teaching* (MKT) (Hill et al., 2005) . The role of SMK or CK in lesson planning should be straightforward: it is essential, but not sufficient. E. K. Hughes (2006) argued that PSTs can bring CK, but they seldom bring knowledge of students' mathematical thinking. Thus, knowledge of mathematics is essentially for high quality planning, but is not the only skill that teachers need to do so.

In a study of PSTs teaching physics to nine to eleven-year-olds, Nilsson (2008) found the PSTs needed pedagogical knowledge (PK) to help them make decisions about preparing and deciding on the teaching methods to use and what materials to include in a lesson. PSTs often felt tied to their plan and were often frustrated at not having enough time to carry out their intended plan. PSTs realized they should “not plan too many activities in one lesson but rather organize the activities over two lessons” because the lack of time and insufficient instructions negatively affected their students' patience and concentration (Nilsson, 2008, p. 1289).

**Novice Teacher Planning.** With their knowledge limitations in content and students due to lack of experience, novices struggle with knowing what is difficult for students and moving beyond their own personal/preferred ways of understanding in order to generate alternative explanations (E. K. Hughes, 2006). Therefore novices are more rigid in sticking with their lesson plan (Nilsson, 2008) and students dictated the content of the lesson (E. K. Hughes, 2006). Morine Valence (1975, as cited in Shroyer, 1981) found that teachers “did not appear to be very flexible with regard to their teaching.” Practicing teachers, not just novices have this tendency.

**Practicing Teacher Planning.** In the Beginning Teacher Effectiveness Study (BTES) (Morine & Valence, 1975 as cited in Shroyer, 1981), gathered data on teachers’ lesson plans. Results showed that teachers wrote minimal information about their lesson plans in their plan books. One might consider this alarming, but in interviews after the lessons, Morine and Valence (1975) found that teachers had much more detailed *mental images* of the class than the plans themselves. This suggests that at some point, teachers develop some sort of short hand or personal code that is used to jog memory and small amounts of text may actually represent larger amount of thought and ideas.

E. K. Hughes (2006) like other scholars (see e.g., Clark & Peterson, 1986; Reusser, 2000), also found that for some novice teachers, written plans underrepresented the thinking that teachers used during the planning process. However, having trained these particular novice teachers with the TTLP, E. K. Hughes (2006) found what was missing in the written lesson plans were things like materials and tools, grouping, time for parts of lesson, and student prior knowledge/experience. When trained to attend to student thinking, novice teachers still have lesson plans that are not fully reflective of their thinking during planning, but the part that is lacking is not anticipation of student thinking (p. 209).

**Expert Teacher Planning.** As teachers become more adept at planning many things start to change in lesson plans. Leinhardt (1993 as cited in E. K. Hughes, 2006) found that experts anticipate difficulties students might have with content, attend to student thinking with more ease and can think along two dimensions (teachers' own thought and students thoughts). Livingston & Borko (1989) found that experienced teachers’ planning was brief and efficient and teachers could elaborate fully when asked to do so. Berliner (2001) found experts to be experts are more flexible, more opportunistic planners, and can change their representations faster when it is appropriate to do so” (p. 464).

In a study of 242 principals in which principals explained perceived causes of teacher ineffectiveness in an opinion survey, lesson planning skills were significantly more of a problem in low-performing schools than high performing schools (Torff & Sessions, 2005, p. 543). While it is uncertain from this study alone if teachers who teach in low performing schools do have poorer planning skills (which has an causal implication as well) or if principals in lower performing schools have a different conception of lesson planning than principals in high performing schools. Either way, it is an interesting finding that perceptions of lesson plans differ across these contexts.

**Summary of Experience and Teacher Planning.** As seen from above, planning impacts lesson implementation. Expert teachers have a more robust PK, CK, knowledge of student learning, support structures/routines and experience, and these resources influence planning practices. Novices (or PSTs) typically have a more difficult time with student thinking and write goals and objectives with student action/activities in mind rather than understandings (E. K. Hughes, 2006, p. 108). As we have seen in several examples, teachers' written lesson plans seldom reflect the entire plan which makes measuring lesson plans as artifacts of teacher knowledge a difficult task.

## Summary

At this point I would like to return us to Ralph, Martha and Zelda to see if we can see patterns in their behavior as indicated by other studies. I would like to address the observations Shroyer (1981, p. 72) made of her participants and connect these observations to other studies and results I have previously discussed. Shroyer (1981) explained that all 3 teachers engaged in unit and daily planning as Clark & Peterson suggest in their description of types of planning (1986). The unit plans were preliminary ideas about what they thought they would be able to cover. These plans were always revised by the daily plans as the nature of student performance could not be made more than a day at a time as Nilsson (2008) also found in with science PSTs. Daily plans were not written out in great details, but neither did the teachers know exactly what they were to do at all times. We have seen this pattern emerge in a variety of our studies (see e.g. Clark & Peterson, 1986; E. K. Hughes, 2006). Finally, some fine tuning, interactive planning, took place while lessons were actually being taught which Reussser (2000) would argue to be microadaptations as teachers made minor deviations, or had to supplement due to circumstances that arose.

Overall, lesson planning is a complicated process in which teachers rely heavily on a variety of informants (previous experience and education, students, school resources) to make important instructional decision while in the moment of teaching. Teachers do not write everything down, but often have extensive mental images of their plans and that when trained, teachers are able to focus on different components of classroom instruction. The field has moved from student activity, to checking for understanding, to relying heavily on student thinking to make instructional and curricular decisions.

[Note: I have more information about lesson study, planning in teams/pairs, and teacher lesson planning compared to other professions. I have omitted those sections for length of this assignment, though I include this note to remind myself and inform my readers that I can make this information available if needed.]

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