

# A Model for Preparing 21st Century Teachers: Teaching for Intellectual and Emotional Learning (TIEL)

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## Abstract

*A complex society requires education that prepares its citizens with complex skills. Yet, successful implementation of the complex pedagogies needed for the 21st century involve teaching strategies and knowledge not yet commonplace in classrooms. To effectively teach K-12 students in today's classrooms, teacher candidates need to understand intellectual and social-emotional elements that form the foundation of complex teaching and learning. This article introduces a pedagogical framework, Teaching for Intellectual and Emotional Learning (TIEL), that supports teacher educators, teacher candidates, and teachers in preparing for complex teaching and learning. Examples of implementation of the model are included.*

The Grand Canyon presents a fitting metaphor for discussing the processes of teaching and learning that are needed in education for the 21st century. The approach to the North Rim of the Grand Canyon is an ordinary mountain drive through flat meadows lined by pine forests. Yet, at the viewpoint, ordinary-ness disappears. Layers of spectacularly colored rock formations and diverse shapes become visible just below the canyon's rim. Pictures, labels, and graphics make the complex geologic processes that formed the canyon accessible and understandable to those who see this panorama for the first time.

Similarly, much of today's education does not look out-of-the-ordinary. Classrooms have desks or tables, chalkboards and bulletin boards. Teachers present lessons. Students listen, answer questions, and complete assignments to demonstrate learning. While these are the visible components of today's education, is there more lying below the rim of what we currently see? Are there elements important to the complexity of teaching and learning that need to be more accessible to teachers? What lies below the educational rim and how might we better see, understand, and implement these elements in classrooms during the 21st century?

This article focuses on the intellectual and social-emotional complexities that lie below the surface in an education appropriate for the 21st century. In the article, I introduce a pedagogical framework, Teaching for Intellectual and Emotional Learning (TIEL), which makes elements of complex teaching and learning visible and accessible to teachers. I developed the TIEL model to use as a theoretical framework for my dissertation research involving classroom teachers who learned to teach self-organization skills of decision making, planning and self-evaluation within the context of student project work.

The article will include a definition of complex pedagogy, a discussion of why complex teaching and learning is needed in 21st century education, a brief review of needs in teacher education, an explanation of the development and conceptualization of the TIEL model, and examples from research on implementation of the TIEL model in elementary classrooms and from ongoing research with teacher candidates enrolled in my teacher education courses. Also included is a discussion of the challenges of implementing the TIEL model in K-12 classrooms and needs for further research.

## **Complex Pedagogy**

Complex teaching and learning include the intellectual and social-emotional complexities that lie below the educational surface. Complex pedagogy involves the conscious planning of curriculum and instruction that integrates the processes that facilitate the development of children's intellectual and social-emotional capacities with subject matter content. Complex, multidimensional learning results from such teaching. For example, when students are explicitly taught the intellectual processes of decision making, planning, and self-evaluation in the context of project work, they not only master content, but learn responsibility, appreciation for themselves as thinkers, and become empowered as self-directed learners.

The complex pedagogy needed in 21st century education retains the best of traditional education while widening the range of thinking to meet broadened intellectual and emotional needs of students. Characteristics of complex pedagogy include "work that is "rigorous and relevant" (Darling-Hammond, 1997, p. 12), curriculum in which students "plan, organize, and evaluate their progress" (Ogle, 1997, p. 2), and learning activities that support "metacognition or the ability to think about [and discuss] their own thinking and learning" (p. 2). In addition to intellectual development, complex pedagogy devotes equal attention to the social emotional learning or "nurturance of the spirit" (Darling-Hammond, p. 31). The aim of social-emotional learning is to help children develop into "humane and decent people" (p. 31) who can make ethical decisions, show empathy to fellow human beings, and appreciate the differences of others.

## **Needs of 21st Century Education**

Education in the 21st century involves a complexity unimagined in the past. Darling-Hammond (1997) has said,

If the challenge of the twentieth century was creating a system of schools that could provide minimal education and basic socialization for masses of previously uneducated citizens, the challenge of the twenty-first century is creating schools that ensure for all students in all communities—a genuine right to learn. Meeting this new challenge is not an incremental undertaking. It requires a fundamentally different enterprise. (p. 5)

Darling-Hammond points out that factors such as economics, technology, and mobility of population contribute to the need for a "fundamentally different enterprise" in education. As societies increase in complexity, they are required "to educate more diverse populations and to ensure higher levels of skill for more citizens" (p. 27).

Complex societies, therefore, require education that prepares its citizens with complex skills. Children who face a world that changes quickly and dramatically need to have the thinking skills and social-emotional characteristics required to thrive in such an environment (Rushkoff, 1996). The complex society in which our students are growing up and being educated requires a new definition of basic skills (Berliner & Biddle, 1995; Murnane & Levy, 1996). Berliner and Biddle state that "pumping bits of knowledge from the past into passive students" (p. 300) is no longer a viable means of educating today's students. In our present society, students will face multiple occupational changes in their working lives and encounter increasingly complex decisions as citizens in a democracy. A different kind of education is needed to prepare the minds of people who can meet the challenges of today and the future. America, as well as emerging democracies around the world, needs citizens who are flexible, who embrace new ideas,

who can reason well when faced with complex ideas, and who are capable of self-directed learning.

Yet, attention to the development of intellectual processes alone will not prepare our children for the demands and responsibilities of the 21st century. While the teaching of thinking is essential in education during this century, the development of social-emotional characteristics is equally important. Having respect for others, an appreciation for difference, and the ability to make ethical decisions is essential not only for survival, but to make positive contributions in a diverse society. Geiger (1995) pointed out the importance of finishing school “not with just a highly trained intellect, but also with a highly trained moral sense” (p. 5). To have a cooperative, respectful society, the development of character, the social and emotional aspects of teaching, will be as important as intellectual progress (Clark, 1990; Damon, 1988; Fenstermacher, 1990; Fine, 1995; Lickona, 1997; Martin, 1987; Sisk, 1982; Wynne, 1985).

## **Preparing Teachers for 21st Century Pedagogy**

Complex pedagogy must include the teaching of thinking and the development of social-emotional characteristics. Many address the teaching of thinking and the development of social-emotional skills (Caine & Caine, 1997; Cohen, 2001; Gardner, 1985; Goleman, 1995; Hoffman, 1991; Marzano, 1993; Perkins, 1995; Sternberg, 1997). Others use research to develop practical programs and strategies that address thinking and social-emotional components of learning (Armstrong, 2000; Charney & Charney, 2002; Lipman, 1995; Marzano, 1992; Thompson, Kushner Benson, Pachnowski & Salsman, 2001; Tomlinson, 1999).

While research in the theory and practice of teaching and learning contributes much to the “new enterprise of education,” integration of this knowledge into teacher education programs and then into K-12 classrooms has been slow. Over the last two decades, much has been written about the lack of including the teaching of thinking in teacher preparation programs (Darling-Hammond, 1997; French & Rhoder, 1992; Goodlad, 1984, 1990; Sarason, 1982). Ashton (1996) goes beyond discussing the teaching of thinking and includes the social-emotional aspects of learning in discussing the “wide range of knowledge and experiences not typically included in teacher preparation programs today” (p. 22). She focuses on knowledge of intellectual and emotional processes that addresses thinking and feeling. These include: (a) interaction of social, emotional, and cognitive forces in learning; (b) new conceptions of teaching consistent with this complex view of students; (c) new conceptions of intelligence; and (d) new conceptions of motivation and assessment. If teaching for intellectual and emotional learning describes what we want for K-12 students, then what are the requirements and competencies necessary for the teachers who will teach them?

## **TIEL: Making Complex Pedagogy Accessible to Teachers**

### **Description of the TIEL Model**

The TIEL model brings together the intellectual and social-emotional elements of teaching and learning that lie at the core of the complex pedagogy described in teacher education literature. The TIEL model is represented by the TIEL Design Wheel (see Figure 1), a graphic organizer that serves as a visual and semantic guide to the intellectual and social-emotional processes that lie below the visible educational rim. The contents of the model are derived from the fields of psychology and philosophy. The model is

depicted graphically by a color-coded wheel divided into ten segments that include five *thinking operations* from Guilford's (1977) Structure of Intellect Theory and five *qualities of character* described by Dewey (1964).

The thinking operations include *cognition* (research, discovery, gathering information), *memory* (recall, remembering, and connection-making), *evaluation* (critical thinking, assessment, and the self-management processes of decision making, planning, and self-evaluation), *convergent production*, (developing a product that involves logical thinking, one right answer), and *divergent production*, (developing a product that involves creativity, risk-taking, and imagination). The social-emotional characteristics or, as Dewey (1964) referred to them, "qualities of character" (p. 197) include *appreciation*, *mastery*, *ethical reasoning*, *empathy*, and *reflection*.

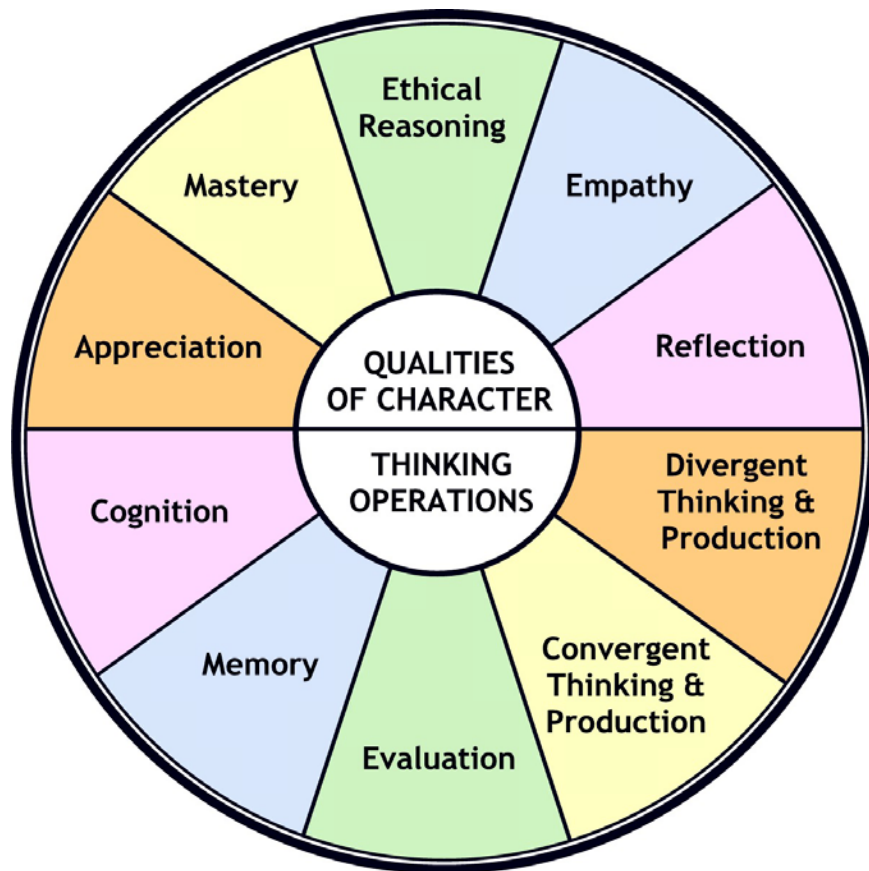


Figure 1. TIEL design wheel

### Conceptualization of the TIEL Model

The conceptualization of the TIEL model developed over time. Early in my teaching career, I was introduced to Guilford's Structure of Intellect Theory within the context of gifted education. When I reflected on my own teaching experiences, I discovered that the five thinking operations defined by Guilford were evident in learning activities that I judged to be particularly successful. I began to purposefully use the five operations to guide my planning as a teacher in programs for gifted students, in

elementary classrooms, and in professional development.

In addition to planning, I used Guilford's terminology to discuss thinking and learning with my students. I noticed that when students understood the different thinking processes expected in a learning activity, they appeared to be more motivated, to learn more deeply, and become more self-directed learners. Nevertheless, there seemed to be something missing. I was not clear how to include the social-emotional aspects of learning in a similarly clear way. It was not until I studied Dewey during my doctoral work that I connected the intellectual components of Guilford's theory to the social-emotional aspects of learning found in Dewey's writings.

While the underlying theories that form the TIEL model are not new, connecting these concepts provide a new perspective on teaching and learning. In the following section, I define each of the components of the TIEL model in more detail, explain the relationship between each intellectual component and the corresponding social-emotional component; and give examples of questions that can help teachers plan more complex learning activities for their students.

*Cognition and reflection.* *Cognition*, defined by Guilford (1977) as “discovering, knowing, and understanding” (p. 48) helps teachers think in new ways about how they will plan for students to obtain information. Teacher candidates learn to see planning not simply as sequencing interesting activities, but as a means to help students develop the intellectual skills of questioning, gathering information, observing, and researching that lead to knowing and understanding. Using the TIEL framework as a guideline for curriculum planning helps teachers ask themselves important questions as they plan. How will I plan for students to gather information in ways that will help them develop understanding? What questions will I ask that will help students develop a variety of thinking skills? What questions might students ask about this topic?

Dewey (1964) connected the intellectual skill of observation, important in acquiring information, to *reflection*. He stated that “there can not be observation in the best sense of the word without reflection, nor can reflection fail to be an effective preparation for observation” (p.196). The TIEL Design Wheel visually reminds teachers to plan opportunities for K-12 students to reflect. How can I plan for my students to reflect on the information and concepts they are learning? How can learning this content help students learn about themselves? How can I help students reflect on the intellectual and social-emotional processes of their learning?

*Memory and empathy.* *Memory* stores information, facilitates recall, and allows us to make connections between concepts and experiences (Guilford, 1977; Jensen, 1998; Sprenger, 1999; Sternberg, 1985; Wolfe, 2001). The TIEL framework helps teachers recognize that memory goes well beyond the recall of information and encourages a broader range of questions. How can this concept be connected to something that is familiar to the students? How can students develop their memory skills within this content area? How can I help students make connections between concepts and thinking processes across multiple subject areas?

While memory serves us academically, it also forms the well of empathy in each of us. Dewey (1964) states that the development of human sympathy, or empathy and caring, is an important “aim of education” (p. 197). To feel compassion for another means “one must draw upon one's own capacity ... one's own experience” (Jersild, 1955, p. 127). An awareness of memory as an important source of our feelings for others and for ourselves, helps teachers consciously link the intellectual skills of memory to the emotional development of *empathy*. This awareness can help teachers understand more clearly that

students bring experiences that influence their learning and behaviors in the classroom. Questions that help teachers reflect on the teaching of empathy include: How can students develop empathy during this study? What experiences have students had that will help them develop empathy for others and for themselves? How can I help the students care deeply about their work?

*Evaluation and ethical reasoning.* Evaluation and ethical reasoning hold center stage in complex teaching and learning. The thinking skills included in *evaluation* include “comparing and judging” information (Guilford, 1977, p. 128) and “reaching decisions or making judgments concerning criterion satisfaction” (Meeker, 1979, p. 17). The opportunity to choose motivates, opens opportunity for exploring options, and promotes self-directed learning. Marzano (1993), in his discussion of mental dispositions, states that the processes of decision making, planning, and self-evaluation “render any activity more thoughtful and more effective” (p. 158) and are necessary for higher-order thinking to take place. The conscious and explicit use of decision making, planning, and evaluation serves as a bridge transferring those same skills to situations in life outside of school (Perkins, 1995). When students learn how to analyze ideas, make decisions using criteria, formulate a plan to accomplish a goal, and evaluate their own work, teachers prepare them to “evaluate how they think and behave well beyond the classroom” (Bain, 2004, p. 94).

The TIEL model makes visible the self-management skills of decision making, planning, and self-evaluation that are often expected, but infrequently taught in an explicit way (Marzano, 1993). The TIEL framework guides teachers in asking themselves questions that focus attention on teaching the intellectual skills that help students develop the skills of self-directed learning. Where can students make decisions within this content study? How can I teach students to set criteria that will help them evaluate their work? What projects will provide an opportunity for teaching students how to plan?

*Ethical reasoning*, or “unswerving moral rectitude” (Dewey, 1964, p. 197), is evaluation anchored by qualities of character. Making ethical decisions requires the same evaluative skills of setting criteria, weighing options, planning or evaluating one’s actions, yet combined with qualities of character that include empathy and appreciation. The TIEL framework reminds teachers to dig deeply into content and ask the following questions. In the course of this study, where can children become aware of decisions based on honesty, respect, and fairness? How can I use group project work to help students develop capacity for ethical reasoning?

*Convergent and divergent production.* It is useful to discuss the thinking operations of convergent and divergent production together in order to clarify the importance of balancing the two kinds of thinking in the classroom. Similarly, the corresponding qualities of character, mastery and appreciation will also be discussed together. Guilford states that *convergent production* is a kind of productive thinking in which “only one answer is considered correct” (Guilford, 1977, p. 109), as well as logical and deductive thinking. Divergent production, on the other hand, involves a broad production of information, resulting in “alternative ideas” (p. 92) and generating information with an “emphasis on variety and quality of output” (Meeker, 1979, p. 20). *Divergent production* includes the kind of fluent and flexible thinking students need to succeed in today’s complex society. Nevertheless, it is the linear sequential thinking focused on the one right answer that is most prominent in the educational system (Berliner & Biddle, 1995; Brooks & Brooks, 1993; Darling-Hammond, 1997; Dewey, 1938; Gehrke, Knapp & Sirotnik, 1992; Goodlad, 1984; Meeker, 1995; Resnick, 1987; Sarason, 1982; Smith & O’Day, 1990).

Understanding the importance of helping students develop both convergent and divergent thinking skills encourages questions that help teachers plan learning activities balanced between the two kinds of thinking. What facts are important for students to learn about this topic? Where can students best practice

sequencing and organizational skills in this study? How can I help students develop logical thinking skills? How can I help students develop divergent thinking skills? How can I plan for students to use their creativity within this content area? Where can I teach students how to use flexible thinking? How can I design assessment that includes both convergent and divergent learning?

*Mastery and appreciation.* While convergent and divergent thinking are important intellectual skills, each corresponds to a social-emotional characteristic important for students to develop. In the context of the TIEL model, there are two ways to consider *mastery*. First, teachers need to be conscious of helping students develop social-emotional self-mastery that includes *reflection, ethical reasoning, empathy, and appreciation* for others as well as for themselves. Second, teachers need to consider the relationship between mastering school skills and the development of social-emotional characteristics. Because assignments, assessments, and standardized testing require right answers, mastery is most associated with convergent production in school. Students who experience repeated failure in mastering school skills develop a “lack of confidence in themselves as learners” (Weiner, 1999, p. 71). For many students, feelings of confusion, frustration, and defeat lead to a loss of confidence that can inhibit development of social-emotional characteristics that students need to be successful learners.

Teachers who are conscious of the qualities of character, mastery and appreciation, can ask themselves the following questions to help them navigate the relationships between these processes. How can I help this student develop mastery in academic skills in order to help him or her develop self-confidence as learner? How can I support students’ development of personal mastery in the area of social-emotional qualities? How can this study help students develop an appreciation for differences and diversity of others? How can I help students develop an appreciation of their own differences? How can art and music support the learning of content while, at the same time, help students develop an appreciation for the arts?

## **Implementation of the TIEL Model**

### **Description of Research**

The TIEL model is both a theoretical and practical framework that can help teachers implement complex teaching and learning. The TIEL Design Wheel served as the theoretical framework for my dissertation research focusing on the *evaluation* component, situating the self-management skills of decision making, planning, and self-evaluation of the *evaluation* component within a larger context of intellectual and social-emotional processes. The research involved four New York City public school elementary teachers in a professional development intervention. Using the TIEL model as practical guide for curriculum development, I taught four teachers in second through fifth grades to teach decision making, planning, and self-evaluation to their students within the context of classroom project work. Two important goals of the research were to assess change in the teachers’ thinking and practice as they learned more complex ways of designing curriculum and to assess the effectiveness of the professional development intervention.

The professional development intervention occurred over the course of one school year. I spent a half-day per week in each teacher’s classroom over the course of one school year. Formal assessments of teacher thinking and practice were conducted at the beginning of the school year and at the end of the school year with an informal assessment mid-year that focused on the professional development intervention. Each teacher selected three students to take part in the baseline and final assessment phases of the study. Data

were collected through classroom observation, teacher and student interviews, analysis of teacher-designed materials, and analysis of student projects. A more detailed account of this research can be found in *Complex Teaching and Learning: Connecting Teacher Education to Student Performance* (Author, 2004).

## **Research Findings**

Each of the four teachers experienced changes in their thinking and in their practice over the course of the research year. They learned to plan more effectively, recognize opportunities for teaching self-management skills, and take risks needed to include increasingly complex project work in their instruction. Students learned to take more responsibility for their own learning and to articulately discuss the thinking and learning involved in their project work. In addition to *evaluation*, the teachers learned to use other components of the TIEL Design Wheel in their teaching.

*Planning.* Tom was an eight-year veteran of teaching who used a constructivist approach in his classroom. As Tom learned to teach his students to plan, he felt that his most important learning moments involved his own planning. In the course of the intervention using the TIEL model, he discovered “that the final project must emerge first and foremost, which will shape the process and the learning outcomes. What helped me learn it was the drawn-out, meandering quality to my class’s immigration study” (Author, 2000, p. 339). He learned that the best way to get where you are going in a reasonable amount of time is to know where you are going in the first place. He saw that this simple planning technique did not preclude creative twists and turns. Yet, it allowed him to make informed decisions about adjustments to the original plan that may be necessary.

*Recognizing self-management opportunities.* While Tom planned for his students to do projects, he had not recognized the opportunities to explicitly teach them how to make the decisions, formulate plans, or participate in the self-evaluation involved in the projects. One of his previous immigration studies was featured in a chapter of a book on constructivist teaching (Winston, 1997). After learning how to use the TIEL Design Wheel to guide curriculum planning he reflected on his earlier teaching and the changes that were now taking place in his thinking and practice. He shared,

It was a great chapter and all. But frankly, the kids didn’t have much say in the process, the progression of events. ...and even I wasn’t ...I was hazy about how long this [the project] was going to last and when we’re going to finish it, and what the final product will be and how are we going to get there. I never engaged them enough in the actual process ...in a sense ...that you’re responsible for your learning. (Author, 2000, p. 340-341)

*Risk-taking.* Opposite in style to Tom, Susan used more traditional teaching methods in her classroom and avoided group project work. Before the research began, she was apprehensive about the prospect of opening the opportunity for students to be consciously involved in thinking and creating projects. The nagging feeling that the class might slip into chaos dissipated, however, when she learned how to teach the students the skills they needed to manage their own projects. By the final assessment, complex projects were an important part of Susan’s instruction. She explained how she felt about including them in the process of setting criteria for evaluating their projects,



I feel a whole lot more comfortable asking them to be involved. I now feel a very strong sense of responsibility to involve them. Now I'd feel like I'd almost be cheating them out of something if I *didn't* involve them.... They produce better work when they know what they are supposed to be creating. And I hope that the criteria also seem reasonable to them, because they helped set it up. (Author, 2000, p. 424, 469)

*Articulating thinking.* At the final assessment, the ability of Susan's students to articulately discuss the thinking involved in their projects revealed not only Susan's change in practice, but her careful attention to discussing thinking and learning with her students. Her students noticed similarities in the thinking processes involved in their projects across the course of the year. One student remarked that "The states project was kind of the same as the other projects because we had to do kind of the same things like plan. We had to look up stuff, like in books and inside the computer and encyclopedias" (Author, 2000, p, 450).

*Responsibility.* Students developed an awareness of responsibility when the self-management skills involved in project work are explicitly taught. Students become aware of the importance of completing what they have started even though adjustments in the plan may be required. One student pointed out the processes of self-evaluation through peer editing. She explained how the students used criteria to check each other's work. She explained,

Two kids can get each other's things done at once. You had to use some of the same criteria. You had to *really* plan what you were going to do and make sure everything was great because you couldn't change the whole thing again. You could change your planning sheet, but if you're doing a project already, you can't really change it [the project itself]." (Author, 2000, p. 450-451)

*Balancing curriculum.* In addition to framing the skills involved in the *evaluation* component, the TIEL model helped teachers become aware of other thinking processes that are important in a balanced curriculum. Ellen, a fifth grade teacher, was particularly skilled in planning learning activities that required divergent production. While she planned many opportunities for students to be creative and manage their learning, parents complained to the principal that they expected "more content." Some of the students, pointing to the more factual work displayed by the class next door, stated that they wanted to learn "more stuff." Understanding the thinking processes of convergent and divergent thinking helped Ellen successfully integrate the teaching of factual content throughout creative learning activities. In a subsequent social studies unit, she outlined the factual information that was important for students to learn, taught students how to use the textbook to support research, and developed criteria with the students that included categories of factual information that were required in their creative projects.

*Observing and reflecting.* Bill, a second grade teacher, had not thought much about his own thinking before the research study began. As he became aware of his thinking, he became aware of the presence or absence of thinking and learning schemas in his students. He wondered, "Do they have a 'way' of doing thinking—or is it just random?" (Author, 2000, p. 530). Using TIEL as a lens for observing his students, Brian developed a deeper understanding of why it is important to explicitly teach self-organization processes.

## **Challenges of Implementing TIEL**

Implementing complex teaching and learning involved many challenges for the four teachers. Learning to

plan curriculum that includes teaching students to make decisions, plan, and self-evaluate is time-intensive and requires careful mentoring. Large class sizes and classroom management presented additional challenges. The teachers also stated that the lack of explicit preparation to teach thinking (Sarason) or to develop complex curriculum (Goodlad) made the task more difficult. Even though all of the teachers had graduated from a noted teacher education program, none of the four teachers involved in the research had been prepared to teach thinking, organize curriculum around a range of thinking or social emotional processes, or develop project-based curriculum that includes the teaching of self-management skills.

At the final assessment, I asked the teachers how using the TIEL framework as part of the professional learning intervention had hindered or helped them in learning to teach decision making, planning, and self-evaluation. Ellen's answer follows, "That [TIEL] makes all the difference. You need to have the framework. I need to have it in order to categorize and sort and scaffold and give myself a framework to go back to. I think it's critical" (Author, 2000, p. 212).

### **Ongoing Research**

The lack of preparation in the area of teaching thinking and developing complex curriculum evident in the earlier research influenced my current choice of research. The study now underway was designed to assess how using the TIEL model in teacher education coursework changes candidates thinking and prepares them to include thinking and the development of social emotional characteristics within the context of grade-level curricula.

I am currently conducting research with six candidates have completed at least two of my courses and have their own classrooms. Similar to the earlier research, I visit the teachers four to six times over the course of the school year gathering data through classroom observations, teacher and student interviews, and analysis of teacher-developed materials and student projects. As in the previous research, I assist them in using the TIEL model to plan curriculum and instruction bridging coursework to classroom.

It is too early to have results of the study, yet there are preliminary indications that using the TIEL model in coursework facilitates the transfer of complex teaching to the classroom. In teaching candidates to use the TIEL model to observe their own teaching and those of others, I have become a more holistic observer of classroom practice. Rephrasing the questions that teachers can use to guide their curriculum development (See Figure 2), I ask myself questions as I observe: How has the teacher planned for the students to get information? How is the teacher helping the students make connections between concepts? Where are the opportunities for students to make decisions? Does the lesson include space for both convergent and divergent thinking?

The TIEL model provides a familiar language that facilitates the discussion of thinking and social emotional learning. Using this language helps me communicate more clearly what I have observed and facilitates the discussion of strengths and areas for improvement in planning. Unlike the earlier research where teachers required considerable time to learn how to discuss thinking, clear communication began immediately in the current research.

Thinking Skills Qualities of Character	Questions
Cognition Reflection	<ul style="list-style-type: none"> <li>• What questions might children ask about this topic?</li> <li>• How will I plan for students to gather information in ways that will help them develop understanding?</li> <li>• What questions will I ask that will help students develop a variety of thinking skills?</li> <li>• How can I plan for my students to reflect on the information and concepts they are learning?</li> <li>• How can learning this content help them learn about themselves?</li> <li>• How can I help students reflect on the processes of their learning?</li> </ul>
Memory Empathy	<ul style="list-style-type: none"> <li>• How can this concept be connected to something that is familiar to the students?</li> <li>• How can students develop their memory skills within this content area?</li> <li>• How can I help students make connections between concepts and thinking processes across multiple subject areas?</li> <li>• How can students develop empathy during this study?</li> <li>• What experiences have the students had that will help them develop empathy for others and for themselves?</li> <li>• How can I help the students care deeply about their work?</li> </ul>
Evaluation Ethical Reasoning	<ul style="list-style-type: none"> <li>• Where can students make decisions within this content study?</li> <li>• How can I teach students to set criteria that will assist them in making their decisions?</li> <li>• What projects will provide an opportunity for teaching students how to plan?</li> <li>• In this study, where can children become aware of decisions based on honesty, respect, and fairness?</li> <li>• How can I use group project work to help students develop capacity for ethical reasoning?</li> </ul>
Convergent Production Mastery	<ul style="list-style-type: none"> <li>• What facts are important for students to learn about this topic?</li> <li>• Where can students best practice sequencing and organizational skills in this study?</li> <li>• How can I help students develop their capacity for logical thinking?</li> <li>• How can I help students develop mastery in academic skills in order to help them develop confidence in themselves as learners?</li> <li>• How can I support students' development of personal mastery in the area of social-emotional qualities?</li> </ul>
Divergent Production Appreciation	<ul style="list-style-type: none"> <li>• How can I help students develop divergent thinking skills?</li> <li>• How can I plan for students to use their creativity within this content area?</li> <li>• How can I teach students to use flexible thinking?</li> <li>• How can this study help students develop appreciation for differences and diversity?</li> <li>• How can art and music support the learning of content while, at the same time, help students develop an appreciation for the arts?</li> </ul>

Figure 2. Questions to guide reflection and curriculum development

Using TIEL during coursework to teach how to integrate thinking and social emotional processes into curricula can help teachers implement this kind of curriculum in the classroom. Four of the teachers at this time have taught the self-management skills of planning and self-evaluation within the context of project work. Another teacher, who is not a participant in this study, reported how she changed her thinking and teaching practice after coursework,

Before I had any knowledge of TIEL, I was not a reflective teacher. My lessons were planned according to the curriculum I had to follow. I became more reflective in my planning and I discovered that children learn best if we (the teacher) allow them to evaluate, explore, and reflect about their own learning. After I changed from direct

teaching, my students became more independent as learners and more empowered in the own learning.

Yet, even with preparation in coursework, implementation of the new methodologies of complex teaching is challenging. While large class sizes and classroom management remain challenges in some of the classrooms, limited time for adequate observation and mentoring is still the greatest challenge. Finding ways to carry out this research on a larger scale, while still providing adequate mentoring is a problem to be solved. Strategies to maximize the learning of complex teaching in coursework will be explored with the teachers as part of the assessment.

## Conclusion

Dewey (1964) seemed to describe the needs of twenty-first century education when he said,

Only a teacher thoroughly trained in the higher levels of intellectual method and who thus has constantly in his own mind a sense of what adequate and genuine intellectual activity means, will be likely ... to respect the mental integrity and force of children. (p. 329)

Students in the twenty-first century require complex teaching that facilitates the development of complex learning. However, complex pedagogy is best implemented when teachers have an understanding of the intellectual and social emotional processes that lie at its core. The TIEL model can be a helpful in making these processes accessible to teachers and scaffold the learning of complex teaching methods. It can help teachers develop a new consciousness of intellectual and social-emotional processes, and support them in developing curriculum and instruction that promote complex learning. Similar to the viewpoint at the Grand Canyon, the TIEL model can serve as a useful tool in preparing teachers who can see below the educational rim.

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## References

- Bain, K. (2004). *What the best college teachers do*. Cambridge, MA: Harvard University Press.
- Berliner, D. C., & Biddle, B. J. (1995). *The manufactured crisis: Myths, fraud and the attack on America's public schools*. Reading, MA: Addison-Wesley.
- Brooks, J. G., & Brooks, M. G. (1993). *In search of understanding: The case for constructivist classrooms*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Caine, R. N., & Caine, G. (1997). *Education on the edge of possibility*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Charney, R., & Charney, R.S. (2002). *Teaching children to care: Classroom management for ethical and academic growth, K-8*. Greenfield, MA: Northeast Foundation for Children.
- Clark, C. M. (1990). The teacher and the taught: Moral transactions in the classroom. In J. I. Goodlad, R. Soder, & K. A. Sirotnik (Eds.), *The moral dimensions of teaching*, (pp. 251-265). San Francisco: Jossey-Bass.
- Cohen, J. (2001). *Safe classrooms/intelligent schools: The social emotional education of young children*. New York: Teachers College Press.
- Damon, W. (1988). *The moral child: Nurturing children's natural moral growth*. New York: The Free Press.

## *A Model for Preparing 21st Century Teachers*

- Darling-Hammond, L. (1997). *The right to learn: A blueprint for creating schools that work*. San Francisco: Jossey-Bass.
- Dewey, J. (1938). *Experience and education*. New York: Collier Books.
- Dewey, J. (1964). *John Dewey on education: Selected writings* (R. D. Archambault, Ed.). Chicago: University of Chicago Press.
- Fenstermacher, G. D. (1990). Some moral considerations on teaching as a profession. In J. I. Goodlad, R. Soder, & K. A. Sirotnik (Eds.), *The moral dimensions of teaching*, (pp. 130-151). San Francisco: Jossey-Bass.
- Fine, M. (1995). *Habits of mind: Struggling over values in America's classroom*. San Francisco: Jossey-Bass.
- French, J. N., & Rhoder, C. (1992). *Teaching thinking skills: Theory and practice*. New York: Garland.
- Gardner, H. (1985). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.
- Gehrke, N. J., Knapp, M. S., & Sirotnik, K. A. (1992). In search of the school curriculum. In American Educational Research Association, *Review of Research in Education*, 18 (pp. 51-101). Itasca, IL: F. E. Peacock.
- Geiger, K. (1995, November). Remarks at 42nd Annual Convention of the National Association of Gifted Children.
- Goleman, D. (1995). *Emotional intelligence*. New York: Bantam Books.
- Goodlad, J. I. (1984). *A place called school: Prospects for the future*. New York; McGraw-Hill.
- Goodlad, J. I. (1990). *Teachers for our nation's schools*. San Francisco: Jossey-Bass.
- Guilford, J. P. (1977). *Way beyond the IQ*. Buffalo, NY: Creative Education Foundation.
- Hoffman, M. L. (1991). Empathy, social cognition, and moral action. In W. M. Kurtines & J. L. Gewirtz, *Handbook of moral behavior and development* (Vol. 1: Theory, pp. 279-). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Jensen, E. (1998). *Teaching with the brain in mind*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Jersild, A. T. (1955). *When teachers face themselves*. New York: Teachers College Press.
- Lickhona, T. (1997). The case for character education, *Tikkun*, 12(1), 22-26+.
- Lipman, M. (1995). Moral education higher order thinking and philosophy for children. *Early Child Development and Care*, 107, 61-70.
- Martin, J. R. (1987). Reforming teacher education, rethinking liberal education. In J. Soltis (Ed.), *Reforming teacher education: The impact of the Holmes Group Report* (pp. 96-100). New York: Teachers College Press.
- Marzano, R. J. (1992). *A different kind of classroom: Teaching with dimensions of learning*. Alexandria, VA: Association for supervision and Curriculum Development.
- Marzano, R. J. (1993). How classroom teachers approach the teaching of thinking. *Theory into Practice*, 32(3), 154-160.
- Meeker, M. (1979). *A structure of intellect*. El Segundo, CA: SOI Institute.
- Meeker, M. (1995). Turning ugly ducklings into swans. *Gifted child today*, 18(2), 30-48.
- Murnane, R., & Levy, F. (1996). *Teaching the new basic skills: Principles for educating children to thrive in a changing economy*. New York: Martin Kessler Books.
- Ogle, D. M. (1997). *Critical issue: Rethinking learning for students at risk*. Retrieved October 28, 2002, from North Central Regional Educational Laboratory Web site: <http://www.ncrel.org/sdrs/areas/issues/students/atrisk/at700.htm>.
- Perkins, D. N. (1995). *Outsmarting IQ: The emerging science of learnable intelligence*. New York: Free Press.
- Resnick, L. (1987). *Education and learning to think*. Washington, DC: National Academy Press.
- Rushkoff, D. (1996). *Playing the future: How kids' culture can teach us to thrive in an age of order and chaos*. New York: Touchstone.
- Sarason, S. B. (1982). *The culture of the school and the problem of change*. Boston: Allyn & Bacon.
- Sisk, D. A. (1982). Caring and sharing: Moral development of gifted students. *Elementary School Journal*, 82(3), 221-228.
- Smith, M. S., & O'Day, J. (1990). Systemic school reform. Draft submitted for publication in S. Fuhrman & B. Malen (Eds.), *The politics of curriculum and testing*. Falmer Press.

## *A Model for Preparing 21st Century Teachers*

- Sprenger, M. (1999). *Learning & memory: The brain in action*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Sternberg, R. J. (1985). *Beyond IQ: A triarchic theory of human intelligence*. New York: Cambridge University Press.
- Sternberg, R. J. (1997). Educating intelligence: Infusing the triarchic theory into school instruction. In R. J. Sternberg & E. Grigorenko (Eds.), *Intelligence, heredity, and environment* (pp. 343-362). New York: Cambridge University Press.
- Thompson, S. J., Kushner Benson, S. N., Pachnowski, L. M., & Salzman, J. A. (2001). *Decision-making in planning and teaching*. New York: Longman.
- Tomlinson, C.A. (1999). *The differentiated classroom: Responding to the needs of all learners*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Weiner, L. (1999). *Urban teaching: The essentials*. New York: Teachers College Press.
- Winston, L. (1997). *Keepsakes: Using family stories in elementary classrooms*. Port Smith, NH: Heineman.
- Wolfe, P. (2001). *Brain matters: Translating research into classroom practice*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Wynne, E. A. (1985, December). The great tradition in education: Transmitting moral values. *Educational Leadership*, 43, 4-14.

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