

Making Conceptual Connections Between the Fields of Gifted and General Education: Teaching for Intellectual and Emotional Learning (TIEL)

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Abstract

While educators in gifted education and general education appear to share many similar goals, a large gap exists in the implementation of complex educational practices that meet the needs of gifted students in general education classrooms or the goals of educational reform.

This paper presents a theoretical framework, Teaching for Intellectual and Emotional Learning (TIEL), that connects intellectual and social-emotional elements from the conceptual foundations of both gifted and general education and scaffolds the learning of complex teaching practices. The paper includes historical contexts of both fields; a review of literature that indicates the need for a unifying framework in general teacher education; a description of the theoretical foundations of the TIEL model; and examples of classroom implementation.

The skyline of St. Louis is punctuated by a gleaming stainless steel arch. The arch, constructed in two separate pieces that meet seamlessly at the top, serves as a reminder of the connections between general education and gifted education brought about through educational innovations found in gifted education research over the last five years (Pfeiffer, 2003). Theory and pedagogical practices that are staples of gifted education and foster complex learning, increasingly are influencing general education in the areas of curriculum differentiation and curriculum development strategies (Tomlinson et al., 1999). Curriculum and teaching strategies that promote complex learning include high-level content knowledge, higher-order thinking including critical thinking and metacognition, self-regulation, and creativity (Darling-Hammond, 1997; French & Rhoder, 1992; Marzano, 1993; McCoach & Siegle, 2003; Van Tassel-Baska, 1991; Van Tassel-Baska & Little, 2003). These concepts and practices, grounded in the intellectual needs of gifted students, are now found in state K-12 educational standards (for example, New York State Education Department, 1996) as well as standards that govern teacher education programs (National Council for Accreditation of Teacher Education, 2002). While descriptions of classrooms rich in choice, driven by inquiry (Pfeiffer), and centered on projects provide an environment in which gifted students thrive (Barone & Schneider, 2003), they also match the characteristics of ideal classrooms described by general education reformers (Darling-Hammond, 1997; Elmore, 1990; Sarason, 1982). Meeting the social-emotional needs of students, long an important consideration in gifted education (Delisle, 1991; Neihart, Reis, Robinson & Moon, 2002; Silverman, 1994; Webb, Meckstroth & Tolan, 1982) is receiving more intense attention in general education classrooms (Charney, 2002; Cohen, 1999, 2001).

While educators in gifted education and general education appear to share many similar goals, a large gap exists in the implementation of complex educational practices that meet the needs of gifted students in general education classrooms. Unlike the Gateway Arch where the two sides meet seamlessly in the air, gifted education and general education practices meet all too infrequently in classrooms where many gifted students spend most of their educational time. What can educators learn from those who applied

fundamental principles from the field of engineering to bring the arch together? How can the conceptual foundations of gifted education provide a way to connect fundamental components of learning and teaching that underlie similar goals in both fields? How can educators utilize knowledge from both fields to support the intellectual and social-emotional “grow[th] of gifted students” (Bernal, 2003, p. 183)?

The purpose of this paper is to present a theoretical framework, Teaching for Intellectual and Emotional Learning (TIEL), that connects intellectual and social-emotional elements from the conceptual foundations of both gifted and general education. The TIEL framework helps prepare general education teachers with an understanding of the intellectual and social-emotional components that lie at the core of teaching and learning environments where gifted students thrive. The paper will include a brief history of gifted and general education that places the intersections between the two fields within a historical context; a review of literature from general teacher education that indicates the need for conceptual knowledge found in gifted education; a description of the TIEL model with a review of the theoretical foundations on which it is based; and a discussion drawn from a qualitative research study of how implementation of the TIEL model can help prepare teachers who will recognize a diversity of learning needs, including those of gifted children, and integrate a wide band of intellectual and social-emotional processes into their teaching.

Historical Context

Referring to the availability of published materials and opportunities that support the development of creativity for today’s students, Piirto (1998) points out that “things have changed” (p. 4) in today’s education. It was not always so. The system of education in the United States, designed at the turn of the 20th century to prepare poor citizens and immigrants for socialization and factory work, possessed few of the educational practices that would be considered appropriate for gifted children. Indeed, much of the education of that time was inappropriate for the majority of children. In 1913, Helen Todd investigated the condition of children working in factories and found that 80% “preferred the long hours, filthy conditions, and drudgery of that work to the conditions they had experienced in school” (as cited in Darling-Hammond, 1997, p. 40). The system did not just prepare children for factory work, school itself became a factory, as hierarchical managerial styles were incorporated, a bureaucracy of paperwork proliferated, and the numbers of non-teaching personnel increased in schools (Darling-Hammond).

As the general education system was getting off to a regimented start, difference in learning abilities was gaining attention. In 1904, Alfred Binet and Theodore Simon were commissioned in Paris to devise an instrument that would differentiate children of normal and deficient intellectual capacity. While this test of general intelligence was used to correctly place children of into specialized educational settings, their work was soon utilized to assess the intelligence of gifted children (Tannenbaum, 1983). Lewis Terman of Stanford University modified the Binet test in 1916 and used it to identify participants for his major longitudinal study of gifted children that continued until the late 1950s. The Americanized version was renamed the Stanford-Binet and was widely used to assess the abilities of children in United States schools (Colangelo & Davis, 1997; Karnes & Nugent, 2002).

During the 1920s gifted education became a recognized field (Van Tassel-Baska, 1991) that coincided with the progressive education movement. Throughout the 1920s and 1930s notable pockets of progressive innovation struggled amidst the rote learning that dominated the rest of education. John Dewey and Leta Stetter Hollingworth, both with ties to Teachers College, Columbia University, revealed the commonalities in educational practice that could exist between general education and gifted education.

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Dewey (1938, 1964) advocated progressive education for all children that included rigorous content, project work, independent thinking, self-management, and creativity. When Hollingworth opened the Speyer School Experiment in New York City in 1936, she used these same methods of teaching and curriculum development in her work with gifted children (Klein, 2002).

During World War II, almost all traces of progressivism were erased along with the limited opportunities for the gifted that had earlier existed (Tannenbaum, 1983). The launching of Sputnik in 1957, however, began a flurry of educational reform that revived progressive methods of teaching. While educators (Bestor, 1953; Koerner, 1963; Lynd, 1953) had begun to criticize shortcomings in education early in the 1950's, the political climate brought about by Sputnik, resulted in significant changes leading to a more "intellectually challenging education" (Darling-Hammond, 1997, p. 11). While gifted students received special focus through accelerated and complex curriculum, students in general education also benefited from the outpouring of government money and interest through development of curriculum that emphasized higher-order critical and creative thinking within high-level content (Darling-Hammond; Karnes & Nugent, 2002). Nevertheless, notwithstanding the value of the educational innovations that followed Sputnik, these elements of complex teaching and learning disappeared once again in the back-to-basics movement of the 1970s (Darling-Hammond).

It is, therefore, not surprising that the 1970s became a time of intense advocacy for gifted education. Tannenbaum (1983) describes the years following Sputnik and the 1970s as "twin peak periods of interest in gifted children" (p.16). By the 1960s Guilford's (1977) work had established a multidimensional aspect to the concept of intelligence, and Bloom (1956) had introduced his taxonomy that facilitated integration of thinking into teaching objectives. In 1972 the Marland report, describing six dimensions of giftedness, was presented to the United States Congress (Karnes & Nugent, 2002), further turned attention to gifted education.

Indeed, Borland (1996) refers to the decades of the 1970s and 1980s as the halcyon years in gifted education. Programs for the gifted were established in school districts across the country; researchers extended the concept of multidimensional intelligence pioneered by Guilford (Gardner, 1985; Guilford, 1977; Sternberg, 1985), educators in gifted education developed program models (Borland, 1989; Renzulli, 1977) linking theoretical constructs to practice. Still others applied research in the intellectual and social emotional development of gifted students to curriculum development (Betts, 1985; Kaplan, Kaplan, Madsen & Gould, 1973; Maker, 1982).

As gifted education propelled the understanding of intellectual and social emotional aspects of learning forward, general education was embarking on what would become three waves of school reform. This education reform movement began in the 1980s in response to *A Nation at Risk* (Goodlad, 1984), extended through the 1990s, and continues to the present time. The first wave included a new emphasis on coursework and testing mandates; the second addressed improvements in teaching and teacher education that include progressive education practices; and the third focused on the development and use of more challenging standards (Darling-Hammond, 1997).

The thinking of many in the field of gifted education supports the notion that goals held by those in both gifted education and general education are drawing closer than at anytime in educational history. Pfeiffer's (2003) questions, posed to experts in gifted education about trends and issues in the field, reveal some of the similarities in pedagogical goals between gifted and general education. Pfeiffer reports that in the areas of important research and innovations in gifted education in the last five years, the majority of the responses fell into two categories: *educational innovation* and *enhanced learning opportunities*. These

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include “differentiation in the regular classroom; ... value of inquiry-driven curricula; problem-based learning; and increased content-academic rigor” (p. 166), elements also found in current general education reforms.

Notwithstanding the positive underlying intentions of educational reform, several scholars (Bracey, 2002; Eisner, 1992; Popham, 2001) point out shortcomings that include simplistic solutions put forth in government policies, excessive high-stakes testing to monitor progress in attaining standards, and questions about the value of standards themselves. Yet, the underlying intentions of school reform that connect to the principles of gifted education are important for teachers to understand.

At the present juncture in educational history, the conceptual foundations discovered and constructed by researchers and educators in gifted education over the last century are having an influence on teaching in general education classrooms. However, teachers must be prepared to carry out educational innovations. Darling-Hammond (1997) points out that progressive methods of education—those espoused by Dewey, utilized by Hollingworth, and later motivated by Sputnik—required “extensive skill ... to teach both subjects and students well” (p.12). When teachers were not adequately prepared, complex teaching methods did not survive. Pedagogy that includes curriculum differentiation, higher-order thinking, and inquiry-based teaching outlined in reforms, requires an understanding of intellectual conceptual knowledge that forms the foundation of these practices.

Conceptual Foundations for Teacher Education

Teachers and teacher educators in general education have had limited access to the conceptual foundations that undergird complex educational practices. Few teachers or teacher educators, at any point in their formal schooling, have experienced the teaching for complex learning explicitly based on intellectual structures that would help develop desired characteristics of the future teacher (Little, 1993; Smith & O’Day, 1991). Ashton (1996) acknowledges the “wide range of knowledge and experiences not typically included in teacher preparation programs today” (p. 22) and is specific in describing them. All center on knowledge of intellectual and emotional processes that address thinking and feeling: (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.

Complex teaching practices demand a knowledge of the fundamental principles of thinking and learning that have not been a focus in general education. If there is a great deal of consensus about the need for understanding the teaching of thinking in the classroom, there is comparable agreement about the shortcomings of teacher preparation programs in developing that knowledge. There is abundant evidence that most teacher preparation programs have not adequately prepared teachers in the area of understanding explicit thinking processes for them to confidently apply this knowledge in their teaching practice (Ashton, 1996; Darling-Hammond, 1997; Goodlad, 1990; National Commission on Teaching and America’s Future, 1996; Sarason, 1982).

Sarason (1982) reports that in the hundreds of classrooms he has visited, he noticed a lack of explicit discussion of thinking and learning. When asked, teachers gave basically two reasons:

First, there was little or nothing in their training that would enable them to handle the issues [of thinking about thinking and learning with children] in the classrooms. Second,

even if they wanted to or could handle them, the demands of curriculum coverage leave little time for such matters. (p. 222)

French and Rhoder (1992) ask why the thinking classroom they describe is rarely found. Wasserman et al. provide the following two reasons similar to Sarason's findings: "Teachers haven't been trained to think effectively themselves ... [and] teachers haven't been trained to teach thinking skills and strategies" (as cited in French & Rhoder, p. 61). Understanding the intellectual components that underlie the terminology of thinking can help teachers create learning activities that include a wide range of thinking processes involved in complex learning.

Conceptual Foundations of the TIEL Model

The TIEL model makes fundamental intellectual and social-emotional foundations that commonly applied in gifted education accessible to teachers and teacher educators in general education who seek to develop "empowering" (Darling-Hammond, 1997, p. 33) methodologies that facilitate complex learning. Derived from the work of Guilford (1977) and Dewey (1964), the TIEL model is depicted graphically by a color-coded wheel that includes *thinking operations* from Guilford's Structure of Intellect Theory and *qualities of character* described by Dewey (See Figure 1).

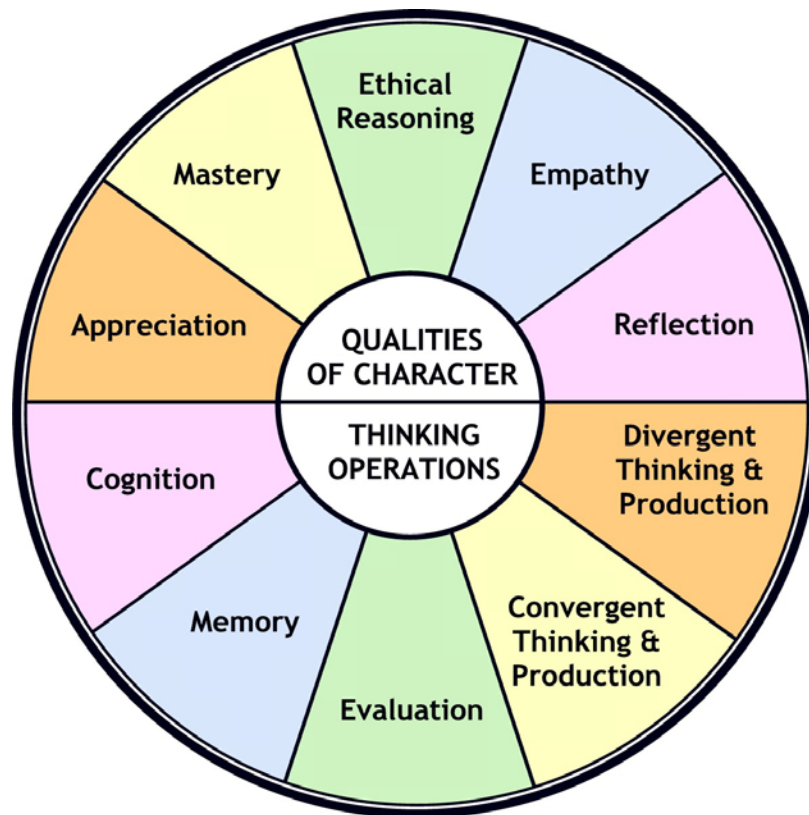


Figure 1. TIEL Design Wheel

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The TIEL Design Wheel can be visualized as a layered, movable artist's color wheel that shows corresponding concepts across the wheel as well as multiple relationships among the components. For example, *divergent production* corresponds to *appreciation*, yet relationships between *divergent production* and *ethics* or *divergent production* and *reflection* as well as others may also be considered. While many of the elements found in the TIEL model are found in educational psychology and foundations courses, bringing the intellectual and social emotional components together in a flexible and visual graphic helps teachers and teacher candidates to understand and internalize these elements.

The Structure of Intellect Theory developed by psychologist Guilford (1977) during the 1940s and 1950s is useful in clarifying the terminology of thinking. When I began my career in gifted education in the late 1970s, the work of Guilford and Meeker (1969) deepened my understanding of gifted children. Their work also helped me implement the curriculum development and teaching strategies that I was learning from my teachers and mentors in gifted education. Later, in my doctoral work, I discovered that Dewey (1964) provided a complementary framework for the development of social-emotional characteristics.

General education teachers now are in a similar position to those of us who began teaching in gifted education when many of the pedagogical theories and practices for educating gifted students were in development. Those entering teaching now must learn how to teach higher-order thinking, use inquiry-driven instruction, and manage project-based learning. In addition, they must learn to differentiate curriculum and more explicitly address the social-emotional development of their students. Experienced teachers are faced with restructuring their teaching in significant ways, a challenging process not unlike remodeling (Tieso, 2003) a physical space in which you are currently living. Linking the work of Guilford and Dewey, the TIEL model provides a powerful tool that connects both fundamental thinking processes and social-emotional characteristics that can help teachers learn to plan curriculum and instruction that promote intellectual as well as character development in students (Folsom, 2004).

Thinking Operations

Guilford's (1977) theory greatly expanded the limited view of intelligence at the time to include creativity and a broadened concept of evaluation. The Structure of Intellect is a three-part theory that includes *contents*, *operations (processes)*, and *products*. The TIEL model makes use of the *operations* component that describes the various ways in which information is processed and is defined as "the alternative ways in which the organism can process any kind of informational content and develop out of it products that take any form" (Tannenbaum, 1986, p. 126). The five operations described by Guilford form the lower half of the TIEL Design Wheel: *cognition*, *memory*, *evaluation*, *convergent production* and *divergent production*. The definitions of these five operations are instructive in helping teachers understand the terminology of the thinking processes they want students to develop.

Cognition is defined as "discovering, knowing, and understanding" (Guilford, 1977, p. 48). Meeker (1969) defines *cognition* as "immediate discovery, awareness, rediscovery, or recognition of information in various forms; comprehension or understanding" (p. 14). *Memory* is defined as "retention or storage" of information (p. 16). Sternberg (1985) adds to this definition by pointing out the role of memory in making connections between new and old information. *Evaluation* includes "comparing and judging" information (Guilford, p. 128) or "reaching decisions or making judgments concerning criterion satisfaction" (Meeker, p. 17). *Convergent production* is the focused production of information. *Convergent production* is a kind of productive thinking in which "only one answer is considered correct" (Guilford, p. 109) as well as logical and deductive thinking. *Divergent production*, on the other hand,

refers to creative thinking that involves broad production of information, producing “alternative ideas ... which satisfy a somewhat general requirement” (p. 92). Divergent production generates information with an “emphasis on variety and quality of output” (Meeker, p. 20).

Qualities of Character or Social-Emotional Factors

Similar to Guilford, Dewey also devoted a great deal of time to thinking about thinking. Throughout Dewey’s (1938, 1964, 1991) writings, he emphasizes the importance of thinking and intellectual organization. Dewey describes a variety of thinking processes that have much in common with the basic definitions found in the *operations* component of the Structure of Intellect Theory. Dewey mentions the intellectual process of *observation* that Guilford includes in *cognition* (Dewey, 1964). Among the factors essential to thinking, Dewey includes “store of experience and facts” (Dewey, 1991, p.30) that corresponds to Guilford’s operation, *memory*. Dewey (1916, 1938, 1964) wrote extensively on the self-management skills that Guilford included in the operation *evaluation*. Believing strongly in the initiative of the learner, Dewey advocated project work that allowed students to experience the self-management skills of decision-making, planning, and self-evaluation (Dewey, 1938, 1991; Folsom, 2004; Kilpatrick, 1936). Other factors that Dewey considered “essential to thought” include “orderliness” and “flexibility” (1991, p.30). These skills correspond to Guilford’s last two thinking operations, *convergent production* and *divergent production*.

Dewey (1964), however, went beyond the intellectual aspect of teaching and learning. He saw education as both “an ethical and psychological problem” (p. 197), and thought there should be a degree of “symmetry among all the intrinsic factors in human experience” (Kliebard, 1995, p. 55). For Dewey it was important that the moral or ethical dimensions of learning were somehow linked to the cognitive. Dewey defined the purpose of education as “the training of the powers of intelligence and will with the object to be attained ... a certain quality of character” (p. 197). Character, a “measurement of mental power” (p. 197), involves five qualities that include “reflection, mastery of truth and laws, love of beauty in nature and in art, strong human sympathy, and unswerving moral rectitude” (pp. 196-197). With some adaptation of Dewey’s terms, these qualities comprise the social-emotional components of the TIEL model.

Bringing the Cognitive and Social-Emotional Domains Together

Bringing together the cognitive aspects of learning from psychology and the *qualities of character* (moral or social-emotional dimension of learning) found in educational philosophy, the TIEL model connects components from each discipline in the following ways.

Cognition and reflection. Dewey links the intellectual activity of observation within the operation of *cognition* to *reflection*, the power to “master and not be mastered by the facts” (Dewey, 1964, p. 197). He warns against the quantitative gathering of facts and information with no regard to the connection and organization of those facts. The connecting and organizing is the product of reflection, or what Dewey calls, “the formative energy of the intelligence” (p. 196). He says, “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). As Borland (1989) points out, “Thinking requires an object of thought” (p. 178).

The linking of cognition to reflection emphasizes the importance of content in relation to process. Darling-Hammond (1997) points out that complex teaching that includes the processes of thinking and

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social emotional learning as well as rigorous content understanding can be difficult. Process, however, cannot be neglected for content, nor can content be neglected for process. For example, teachers can lose sight of the subject content in favor of process or overlook the teaching of thinking processes in an effort to cover factual content. Understanding both intellectual and emotional processes and their interdependence can more clearly help teachers achieve a balance.

Memory and empathy. *Empathy* or “human sympathy,” in Dewey’s (1964, p. 197) words, connects with *memory*, linking new knowledge to previous experiences. To feel compassion for another means “one must draw upon one’s own capacity ... one’s own experience” (Jersild, 1955, p. 127). It is through remembering experiences of caring, either in reality, or sometimes vicariously through observing the experiences of others, that we learn to be caring individuals. As we empathize with others, the connecting cues to our own experiences are strengthened and our capacity for empathy increases (Hoffman, 1991).

Evaluation and ethical reasoning. *Ethical reasoning* or “moral reasoning,” (Dewey, 1964, p. 197) corresponds to the operation of *evaluation*. Higher-order thinking, critical thinking, and self-regulated learning share foundational processes (Lewis & Smith, 1993; Struck, 2003) found in the *evaluation* component of the TIEL framework. Marzano (1993) 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. Similarly, self-regulation requires teachers not only to allow for self-directed activities, but to understand how to teach their students to set criteria, plan, and self-evaluate. Critical thinking, often used interchangeably with the term *higher-order thinking* (Lewis & Smith), involves the analysis of criteria in the making of judgments. The *evaluation* section, including each of these mental processes, helps teachers understand learning experiences that give students opportunities to develop higher order thinking.

The skills of defending choices with sound criteria and setting standards by which to evaluate ourselves are the same basic skills needed in making *ethical reasoning*. However, moral or ethical decisions include valuing and having consideration for others, characteristics found within the components of *empathy* and *appreciation*. The need for internal integrity is especially important to gifted children who feel moral dilemma strongly (Kanevsky & Keighley, 2003).

Mastery and convergent production. Dewey’s (1964) term, “*mastery of truth and laws*” (p. 138), implies an external absolute. Similarly, mastery in learning usually involves an answer or skill expected by someone else other than the learner. *Mastery* often connects to logical thinking and the problem solving that involves a search for the one right answer. It is important to understand convergent thinking in relation to other processes of thinking because of its prominence in the educational system (Berliner & Biddle, 1995; Brooks & Brooks, 1993; Darling-Hammond, 1997; Dewey, 1938; Goodlad, 1984; Meeker, 1995). Yet, today’s students, need, and gifted students require, opportunities to search for patterns, forge connections, and make informed decisions (Bailey, 1996; Kanevsky & Keighley, 2003; Rushkoff, 1996).

Divergent production and appreciation. The TIEL framework places creativity and appreciation in a position of equal importance to other areas of intellectual endeavor. Dewey’s *appreciation* for beauty in arts and nature is related to creative thinking within the operation of *divergent production*. Guilford (1977) defined divergent production as “a broad search for alternatives” (p. 93). “Inventing, designing, contriving, composing, and planning” (p. 78) are all examples of divergent thinking. Developing the traits of creativity, including fluency, flexibility, originality, and elaboration (Guilford, 1968; Williams, 1981), can increase capacity to appreciate the diversity found in nature, the arts, and cultures.

Hence, the TIEL model, derived from the work of both Dewey and Guilford, provides a graphic reminder to teachers that teaching and learning includes not only intellectual components, but also components of the moral or social-emotional dimensions as well. Dewey's five qualities of character integrated with Guilford's five intellectual operations form a powerful instructional framework that can help teachers better understand complex teaching and see new ways of designing learning experiences that "nurture the spirit as well as the mind" (Darling-Hammond, 1997, pp. 5-6).

Application of TIEL Model in Teacher Education

In the latest waves of educational reform, complex teaching methods developed to meet the intellectual and social-emotional needs of gifted learners have increasingly become the "province of all learners" (Van Tassel-Baska, 2003, p. 7). Speaking from the perspective of general education reform, Darling-Hammond (1997) states that "...our very concept of teaching will have to change" (p. 32). She continues,

Schools must dramatically increase the intellectual opportunities they offer ...[becoming] more learning centered ... more learner centered ... and deliberately organized to attend to the varied developmental and cognitive needs...teachers must understand how their students think as well as what they know. (p.32)

Yet, pedagogy that is considered a common-sense necessity in gifted education has been a difficult-to-achieve revolution in general education. To increase intellectual opportunities in classrooms, teachers need a fundamental understanding of the intellectual and social emotional aspects important in learning, and concomitantly, in teaching.

The TIEL Model scaffolds this needed foundational learning in several areas that helps teachers understand and implement more complex ways of teaching. Four are shared here: *characteristics, curriculum, communication, and consciousness*.

Examples of how implementation of TIEL scaffolds complex teaching will be drawn from a qualitative research study involving the TIEL model. The research, extending over a nine-month period, involved four New York City public elementary school teachers who participated in a professional development intervention that focused on the *evaluation* component of the TIEL model. I chose to focus on the evaluation component because of its centrality in understanding self-organization skills involved in project work and the importance of choice in the learning of gifted students (Dewey, 1938; Kanevsky & Keighley, 2003) and in understanding the goals of educational reform. The purpose of this study was to determine the teachers' change in thinking and practice over time as they learned how to plan and manage learning activities that included the self-organization skills of decision-making, planning, and self-evaluation within the context of student project work. The TIEL Design Wheel served as a theoretical framework for the study as well as a practical tool for guiding the design of project-based curriculum that included the teaching of self-organization skills. Data collection occurred at the beginning and end of the intervention using classroom observations, teacher and student interviews, and analysis of teacher-designed materials and student projects (Folsom, 2000).

Characteristics

The TIEL model helps teachers acquire new pedagogical characteristics. To implement complex teaching strategies, teachers must acquire pedagogical characteristics more commonly associated with teachers of the gifted that include "... flexibility, creativity ... openness ... ability to apply knowledge to real-life problems ... empathy, and tolerance for ambiguity" (Mills, 2003, p. 273) [as well as] "multicultural sensitivity;... [and capacity for] critical thinking" (Bernal, 2003, p. 188). Teachers need characteristics that will support learning environments for students that offer "control, choice, challenge, complexity, and caring" (Kanevsky & Keighley, 2003, pp. 23-25).

The TIEL Design Wheel visually scaffolds such a learning environment. The area of *evaluation* clarifies thinking skills involved in giving students more control over their learning through offering choice. The *cognition* area of the TIEL Design Wheel helps teachers see the possibilities for students to gather information in deeper ways that include inquiry, discovery, observation, and research. The juxtaposition of *convergent production* and *divergent production* helps teachers clearly see fundamental contrasts in thinking that requires logic and right answers and thinking which generates a multiplicity of options. Allowing students time to research topics of their choice and express their learning in divergent ways results in the challenge and complexity that reform measures desire, but gifted students require.

Stacy, a fourth-grade teacher, changed her traditional ways of thinking about teaching and developed new pedagogical characteristics. On the one hand, she saw that designing traditional curriculum that depended on worksheets required less demanding planning skills. Yet, on the other, she saw the rewards of the more complicated project planning. At the baseline interview, she stated, "Maybe I can be brave enough to try a project, but it feels risky for me" (Folsom, 2000, p. 417). Yet, by the end of the year, Stacy had successfully designed and implemented four project-based units. She explained the paradox she had experienced.

What feels like the least demanding way to plan is always the most staid. You know, if I just go by the workbook, I can see where everybody is and it is very easy on some level. Doing complicated planning, workshops and the like ... I think, how can I get into it?

Yet, when I am into it, it is so rewarding and in some ways there is such a clear agenda. In a way, it's like announcing, "We're going to be great now. How do we make the room a place where we can be great?" It feels so much more natural and wholesome in a way. (p. 389)

She added, "The kids can be swept up in it [their work] ... I'm not always dragging them on this heavy sled" (p. 390). Although it was hard for Stacy to think about giving up the ease of a more traditional approach to curriculum planning, seeing the investment of the students in their project work motivated her to continue planning such experiences for her students.

Curriculum

The TIEL model is a powerful tool that guides teachers in the development of curriculum that leads to complex learning. To teach in complex ways, teachers need to understand *content, process, and product* and how to organize curriculum around these concepts (Tomlinson et al., 1999; Van Tassel-Baska, 2003). The teachers involved in the study had an understanding of *content* as the subject matter and concepts to

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be learned; and *product*, as that which students produce through written, visual, or spoken form. The term *process*, however, was less clearly understood. The TIEL framework helped the teachers see beyond the instructional processes of cooperative learning, independent work, class discussion, and direct teaching to fundamental thinking processes that needed to be included in the development of curriculum. Dewey (1964) 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)

In different ways, two of the teachers changed how they designed curriculum after learning more about the intellectual processes that needed to be included in the curriculum they designed for students. Ted, a creative third-grade teacher who regularly used project work in his class, began to recognize what was missing in the learning experiences he planned. He described his teaching, before learning how to incorporate decision-making, planning, and self-evaluation into project work.

Frankly, the kids didn't have much say in the process, the progression of events...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. What are we going to need to know in order to get there? So I was always great at giving them creative activities and immersing them in experiences. I never engaged them enough in the actual process ...in a sense ...that you're responsible for your learning. (Folsom, 2000, pp. 340-341)

Ted became more committed to "finding those pockets in the curriculum where the kids can maneuver, where they can have a voice. Spaces in the curriculum where they can manipulate [their own] learning" (p. 341).

Erica, a fifth grade teacher, used her understanding of intellectual processes in a different way to change her approach to curriculum development. Similar to Ted, Erica was inclined to the divergent thinking of project work, and she quickly learned to incorporate decision-making, planning, and self-evaluation into project-based curriculum. However, she often neglected the factual, convergent aspect of teaching content. When parents and some students became concerned about the lack of factual content, Erica used the TIEL model to evaluate her planning. While she recognized her strengths in planning divergent activities and applying the new strategies of teaching self-organization skills within the context of project work, Erica could see that she often gave less attention to content. In a subsequent study on South America, Erica included more *cognition* and *convergent production* as she taught the students how to use the Social Studies textbook and other sources as references to find information on their topics. She commented,

I tend to go toward divergent kinds of work, but I really need to focus in on yellow (convergent thinking). Just like I do in my curriculum planning. But it really helped for the kids to start being able to see [different kinds of thinking]. ...and to be more comfortable about talking about how they think. (Folsom, 2000, p. 249)

Communication

The TIEL model helps teachers develop capacity to *communicate* about thinking and learning. Metacognitive discussion, a higher-order thinking process common in gifted education, is now an expected strategy in many general education classrooms (Van Tassel-Baska, 2003). In Erica’s experience, she learned something that teachers of the gifted have long known. When students can discuss their thinking, they can advocate for their own needs and often influence change.

The TIEL model provides a language with which teacher educators can discuss thinking and learning with teachers so that they in turn can discuss thinking and learning with their K-12 students. To facilitate metacognition, Erica posted large colored charts in her room that included the names of each component of the TIEL Design Wheel and subskills within each component (see Figure 2). Erica used these charts to discuss thinking with the students as they completed their United States study that included an elaborate State Fair. Working alone or in groups, students researched a state and created an information booth from which they taught guests who visited from other classes.

During the final student interview, conducted with three students whom Erica chose based on a range of intellectual abilities, the students were able to clearly discuss the thinking involved in this project. Referring to the TIEL charts, the students analyzed their State Study projects. Pointing to the *evaluation* and *cognition* charts, S— and V— told about planning and getting in gathering information.

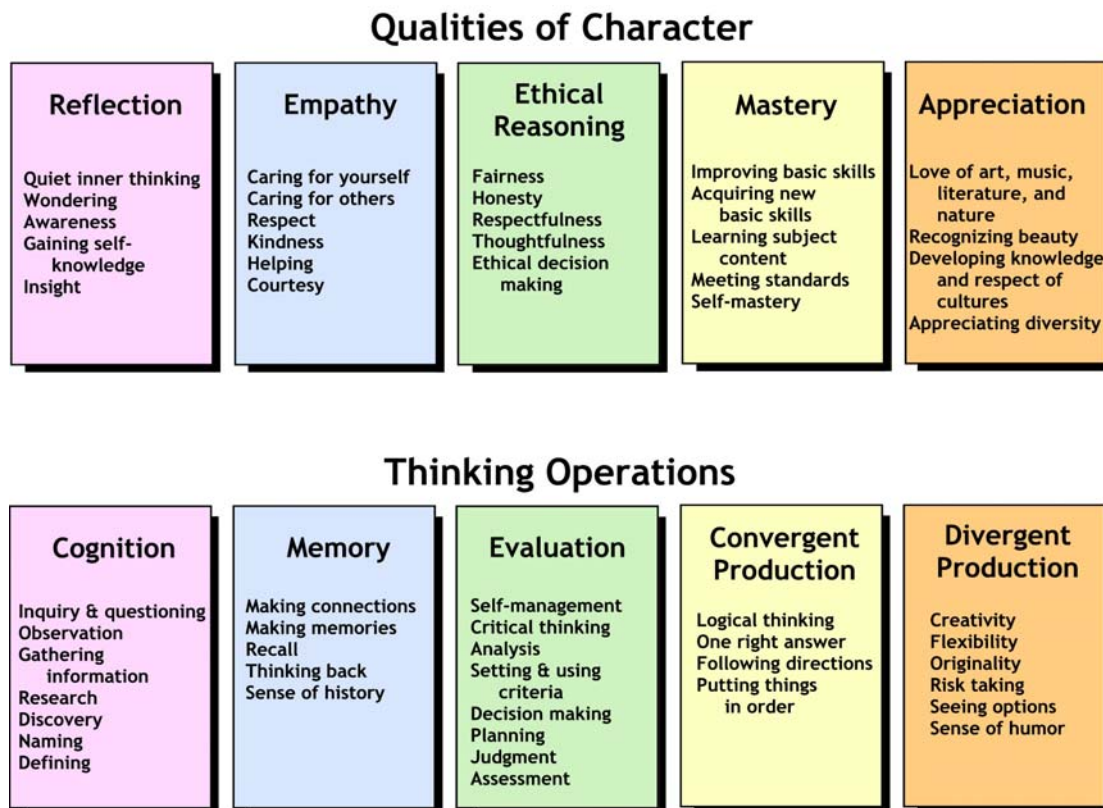


Figure 2. TIEL Charts

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- S—: We plan our stuff out first of all.
- V—: Get our information. We had a calendar and we check off stuff and if we want to [we can] have something done before it's even supposed to be done.
- S—: Get all our props ready. Pick our spots.
- B—. [Referring to the proposal each student wrote at the beginning of the project.] In the proposal planning you explain to Miss L— how you want your project to be so she can really get a sense of how everybody's project is going to be. (Folsom, 2000, p. 264)

Presenting TIEL visually in the classroom helped the students see the patterns of process emerge across subjects and assignments. B-- went on to discuss the similarities with other projects:

The end of the project is really similar [to previous projects] because we evaluate ... like ... Was our presentation done well? Was it in the right form? Were our brochures in the state study noticeable? Do they grab the audience's attention? Was our spelling accurate? (p. 264)

Consciousness

The TIEL model helps teachers develop and maintain a *consciousness* of basic intellectual and social-emotional processes important in observing and reflecting on complex teaching. While many teacher education programs emphasize reflection (Rogers, 2002; Weiner, 1999; Zeichner & Liston, 1996) to help teachers “internalize the dispositions and skills to study their teaching” (Zeichner & Liston, p. 6), it matters how that reflection is carried out and what guides that reflection.

As Dewey (1964) pointed out, reflection and observation are interdependent. As in many teacher preparation programs, student teachers are required to develop a case study based on their observations of a child in order to learn skills of observation and reflection. In the courses I teach, the student teachers use the TIEL framework as a guide for observing evidence of the child's intellectual and social emotional development. This example comes from ongoing research with teacher candidates enrolled in current coursework in the masters' program in childhood education where I am using the TIEL model to teach curriculum development.

Cathy, a student teacher, observing a sixth grade child with frequent behavior problems, wrote,

When activities call for convergent thinking, P— often becomes bored. Thus he quickly loses focus. As the reading teacher, I recognized the need to offer opportunities for creativity. To complement their reading of *Cleopatra VII*, I engaged the students in a variety of activities. These included script writing, role-playing, vocabulary stories and an art lesson on ancient mosaics. P— responded well to these activities and behavior was never an issue. A theatrical young boy, he excelled in the areas of script writing and role-playing. His understanding of the book was evident in his mastery of these activities. (Child study by a student teacher)

Observing the presence or absence of complex teaching requires a powerful lens. Using TIEL, the student teacher recognized missing intellectual components that negatively impacted on P—'s behavior. She concluded her case study with the following reflection: "And most importantly, opportunities for creative thinking must be given in class. P— will excel in an environment that fosters creativity" (Child study by a student teacher).

Cathy demonstrates how using the TIEL model to guide her observations, supports her developing skills of reflection as "...a systematic, rigorous, disciplined way of thinking" [that helps teachers gain]... "a deeper understanding of... relationships...and connections to other experiences" (Rogers, 2002, p. 845). Cathy recognized the relationships between P—'s behavior and the convergent learning activities in which he had limited interest. Connecting this experience to her reading lessons, she used her knowledge of P— as a learner to modify the reading lessons by including creative activities. Cathy shows a depth of understanding about the underlying intellectual structures involved in teaching and learning not commonly found in teacher preparation programs (Goodlad, 1990).

Conclusion

Complex teaching and learning, an integral part of gifted education and a primary goal of the educational reform movement, can be better achieved when the underlying theory and practice are clearly understood. The purpose of this paper has been to present a theoretical framework, Teaching for Intellectual and Emotional Learning (TIEL), that connects intellectual and social-emotional elements from the conceptual foundations of both gifted and general education. Historical contexts of both fields and a review of literature from general teacher education were presented as evidence of the need for a unifying conceptual framework. A description of the theoretical foundations and examples of classroom implementation provided evidence of its practicality. The TIEL model can assist teachers in developing characteristics needed for innovative teaching; designing curriculum that fosters complex learning; communicating with students about thinking and feeling; and extending consciousness of individual learning differences

Yet, more needs to be learned about fully implementing the TIEL model as a tool in teacher education coursework. The majority of examples of implementation given in the article are from a qualitative research study carried out with four teachers who had no previous experience with the TIEL model in their teacher education coursework. While this important research shows how a professional development intervention using TIEL can change teacher thinking and practice, research is now needed to learn how the TIEL model can help teachers develop complex teaching methods within the context of coursework.

Research is now underway to assess the effectiveness of using the TIEL model in teacher preparation coursework. The final example of applying TIEL in the K-6 classroom was drawn from ongoing research with teacher candidates who are enrolled in the masters' level courses that I teach. Although early in the research, this example points out that using the TIEL model in coursework can help teacher candidates consider their teaching in conscious and complex ways. Closing the conceptual gap in the arch by making the intellectual and social-emotional foundations found in gifted and general education more widely accessible can only benefit teacher educators, teachers, and the students they teach.

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