Construction of Music Learning

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So what is understanding? . . . Learning facts can be a crucial backdrop to learning for understanding, but learning facts is not learning for understanding. (Perkins, 1998, p. 13)

Teaching for musical understanding is an essential goal for all music educators. Perkins suggests the mere mastery of facts in not enough and that real understanding is evidenced by forms of application. Real learning in music comes from not just knowing "about" but knowing "within" (Reimer, 2003) and this comes from active engagement in the highest quality of music experience possible. I am sure that this is generally believed by the majority of practitioners and researchers in our field, but accompanying notions of how this understanding should be engineered—the philosophical base, the strategies used, the kinds of work products expected, the assessments employed—all the trappings associated with carefully designed music teaching and learning is far from commonly defined.

How music teachers think about the manner that understanding is formed or "constructed" by their students varies enormously. Some are likely to not think much at all about this, assuming learning happens as a result of teacher-centered content and evidence of learning in the form of performances or exams. Others may be more diverse in their approach—allowing for more student-centered content and varied assessment strategies in hopes of encouraging perhaps a deeper and more lasting level of constructed musical understanding. It is to this latter group that

work described in this chapter might appeal. This chapter summarizes writings in music

education that are inspired by a complicated set of interconnected beliefs about learning that are

often labeled as *constructivist* or *constructionist[1]*. While certainly not the only way to honor the

need to be thoughtful about music learning and how it might occur, it does represent an important

force in today's educational landscape and represents one of the "big ideas" in education (Hoover,

2006, online journal).

Constructivism Defined

A reading of the general literature on constructivist thinking, especially within the last twenty

years, reveals a complex mosaic of beliefs by philosophers, approaches by researchers, and

strategies endorsed by practitioners. In terms of educational constructivism in science, one

reviewer (Matthews, 2000, p. 169) identified as many as seventeen different kinds of

constructivism. It might be useful to those new to this topic to understand aspects about

constructivist thinking that seem to be present in most descriptions.

- Knowledge is formed as part of the learner's active interaction with the world.

- Knowledge exists less as abstract entities outside of the learner and absorbed by the

    learner; rather it is constructed anew through action.

- Meaning is constructed with this knowledge.

- Learning is, in large part, a social activity.

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[1] The literature in and outside of music education treats the terms "constructivist" and "constructionist" often with little distinction. One scholar (Gergen, 1985, p. 266) sees "constructivist" as more related to the work of Piaget and less to the tradition as it exists in psychology and sociology. Papert (1980) uses "constructionism" for his writings about learning and the use of artifacts and other tools and this has influenced others who work with technology-based applications in teaching and learning. For the purposes of this chapter, I have adopted what I feel is the more often-used terms of "constructivism" and "constructivist" but citations and other writings will likely be seen as containing a mixture of both sets of terms.

Perhaps the following best represents the essence of constructivism:

> Two important notions orbit around the simple idea of constructed knowledge. The first is that learners construct new understandings using what they already know. There is no *tabula rasa* on which new knowledge is etched. Rather, learners come to learning situations with knowledge gained from previous experience, and that prior knowledge influences what new or modified knowledge they will construct from new learning experiences.
>
> The second notion is that learning is active rather than passive. Learners confront their understanding in light of what they encounter in the new learning situation. If what learners encounter is inconsistent with their current understanding, their understanding can change to accommodate new experience. Learners remain active throughout this process: they apply current understandings, note relevant elements in new learning experiences, judge the consistency of prior and emerging knowledge, and based on that judgment, they can modify knowledge. (Hoover, 1996, online journal)

Constructivism is, first and foremost, a theory about knowledge and learning and not necessarily a theory about teaching practice. This is critical because often a short observation of a teacher might not reveal whether a constructivist approach is at the heart of a teacher's overarching philosophy. Scott (2006) made this point when she described a possible visit to a music classroom to observe a day's worth of activity by a music teacher. Such a visit might

reveal small group work in music composition in one class and a teacher-directed lecture in another. While one strategy might reveal a more constructivist approach, both classes might be functioning over the long term in a constructivist mode. Learning is constructed by students in many ways and under many approaches, however a teacher that chooses a constructivist perspective holds a certain set of key beliefs and chooses to use certain strategies for the majority of time:

> Although constructivism is not a theory of teaching, it suggests taking a radically different approach to instruction from that used in most schools. Teachers who base their practice on constructivism reject the notions that meaning can be passed on to learners via symbols or transmission, that learners can incorporate exact copies of teachers' understanding for their own use, that whole concepts can be broken down into discrete sub-skills, and that concepts can be taught out of context. In contrast, a constructivist view of learning suggests an approach to teaching that gives learners the opportunity for concrete, contextually meaningful experience through which they can search for patterns, raise their own questions, and construct their own models, concepts, and strategies. The classroom is seen as a minisociety, a community of learners engaged in activity, discourse, and reflection. (Fosnot, 1996, p. ix)

The argument is often made that simply "learning-by-doing" is not enough for constructivist learning to occur. It must go deeper by encouraging the learner to link the new with the old by using collaborative communities and engaging in questioning and problem-solving techniques.

There is also the strong belief that learning experiences, particularly in music, should be presented in "authentic" and holistic ways, have the possibility of multiple outcomes, and be structured with ample opportunity for teachers to offer guidance ("scaffold" learning). (Wiggins, Blair, Ruthmann, & Shively, 2006, pp. 85-86) In these regards, the study of teaching method is more pronounced and meaningful in defining what constructivism is.

In the section that follows, I outline some of the major elements from philosophy and social science that form the background of constructivist perspectives, attempting to unpack a rather tangled landscape of ideas and traditions. The section that follows reviews the conceptual writing in music education about constructivist thinking and its role in music teaching and learning; a special part of this section will be a treatment of the many writings that privilege constructivist views as a force in how we prepare music teachers. A short summary of the more practically-based writings will be offered as a testimony to the attractiveness of these approaches. Finally, the chapter summarizes the themes that seem to emerge from the little empirical evidence we have about the application and effectiveness of the constructivist view in music teaching and learning. Considerations for further research are offered.

General Landscape

Epistemological Considerations

A good place to start in understanding the constructivist perspective is with epistemology, that branch of philosophy that is concerned with the theory of knowledge. A key question that is often asked in this context is how is knowledge acquired? Constructivist thinking differs from the standard rationalist and empirical views. For example, it is generally held that rationalism

celebrates innate *reason* and *ideas* with knowledge derived largely from *a priori* processes. Empiricism maintains that the external world is the source of all knowledge and that the world is made up of laws of nature that can be understood and often discovered through experimentation. In contrast, constructivism holds that all knowledge and meaning are constructed by the individual either personally or through social/cultural interaction. Information is interpreted by the mind, and the world is perceived and constructed by individuals in different ways. Newer definitions of knowledge and truth may form new paradigms and inter-subjectivity instead of classical objectivity is valued.

Constructivism also differs substantially from more objective visions of the basis for knowledge. Classic objectivism maintains that the purpose of the mind is to form a kind of "mirror" of reality and that this reality can be studied. Meaning is external to the individual and is determined by the real world (Jonassen, 1991, p. 28). Constructivist epistemology argues the opposite . Knowledge and reality have no objective value that we can determine. The learner constructs reality based on experiences and interactions with the environment. von Glasersfeld, a major proponent of constructivist thinking, maintains that reality " . . . is made up of the network of things and relationships that we rely on in our living, and on which, we believe, others rely on, too." (1995, p. 7). For him and other constructivists, one understands reality through experience in a very personal way and the goal is not to discover an objective reality.

Those interested in further reading on constructivism and epistemology may find the chapter by Howe and Berv (2000) and the article by Derry (1992) to be helpful.

Importance of Social Constructivism

It follows logically that, for those that hold a constructivist epistemology, issues of social interaction must be central. In viewing work in science and mathematics education, Matthews (2000) cites three major constructivist traditions: philosophical (noted above), sociological, and educational. Sociological or social constructivism considers ". . . growth of science and changes in its theories and philosophical commitments are interpreted in terms of changing social conditions and interests" (p. 169).

Phillips (2000) adds that sociological constructivism (considered in perhaps a broader sense than just science and mathematics):

> . . . embodies a thesis about the disciplines or bodies of knowledge that have been built up during the course of human history. I have described this thesis as, roughly, that these disciplines (or public bodies of knowledge) are human constructs, and that the form that knowledge has taken in theses fields has been determined by such things as politics, ideologies, values, the exertion of power and the preservation of status, religious beliefs, and economic self-interest. This thesis denies that the disciplines are objective reflections of an external world. A consequence of this general position for many theorists has been that the origin of human knowledge, and its standing *as* knowledge, are to be explicated using sociological tools rather than epistemological ones. . . (p. 6)

The British scholar, Vivien Burr, inspired in part by the writings of Gergen (1985), provides a useful overview of what she calls social constructionism (Burr, 1995). She describes four key assumptions that unify many social constructionist perspectives. The first centers on the idea that

a *critical stance be taken toward ways of understanding the world (including ourselves)* (p. 3).

She goes on to write:

> For example, just because we think of some music as 'classical' and some as 'pop' does not mean we should assume that there is anything in the nature of the music itself that means it has to be divided up in that particular way. A more radical example is that of gender. Our observations of the world suggest to us that there are two categories of human being—men and women. Social constructionism would bid us to question seriously whether even this category is simply a reflection of naturally occurring distinct types of human being. (p. 3)

A second assumption is that *the ways that we understand the world are historically and culturally specified*. We come to understand the world on the basis of where and when one lives. Forms of knowledge in any culture are artifacts of time and geography. Truth, in this sense, is relative.

A third assumption is *that knowledge is sustained by social processes*. People are constantly engaged with each other.

> It is through the daily interactions between people in the course of social life that our versions of knowledge become fabricated. Therefore social interaction of all kinds, particularly language, is of great interest to social constructionists. The goings-on

between people in the course of their everyday lives are seen as the practices during which our shared versions of knowledge are constructed (p. 4).

Finally, *knowledge and social action go together*. Although we may define a number of possible constructions of the world, a prevailing construction does have an effect on our action as a society.

Burr continues her description by citing seven ways that the constructivist view differs from more traditional psychology:

- Anti-essentialism: there are no 'essences' inside things or people that make them what they are

- Anti-realism: denial that knowledge is a direct perception of reality, there is great suspicion of the notion of an objective fact

- No notions of discovering the "true" nature of people and social life: attention should be placed on historical study of ever-changing nature and social life

- Language as a pre-condition of thought: language is a key to understanding thinking and this provides a framework for understanding meaning making

- Language as a form of social action: language is more than a vehicle for expressing ourselves, it is seen as a form of action for construction

- Focus on interaction and social practices: it is not the social practices themselves that are of interest, it is the interaction of these practices

- Focus on process: emphasis is not on static entities such as personality traits or memory models, but on the dynamics of process found in social interaction (pp. 5-8).

Social constructivism has had and continues to have strong influence in sociology and psychology. Its proponents find themselves in harmony with many of the postmodern movements that have challenged traditional thinking in many disciplines. One example of the collision of ideas in this context can be noted in the famous "science wars" of the 1990s (Slezak, 2000). Essentially, this debate—often quite heated in the literature—centered on postmodern views that questioned the long-held view of objectivity in science. Karl Popper, writing in the 1940s, is often cited as a leading figure questioning the objective contentions of science and this line of thinking led in part to the arguments in the 1960s. The interesting aspect of this for education continues to be the nature of how we represent "truth" in our classrooms.

Readers may well find these aspects of social constructivism to their liking for work in music, especially for those scholars grounded in more postmodern perspectives that relate to issues of power, truth (or absence of same), and feminist theory (Alcoff & Potter, 1993). Further readings about social constructivism might include work by Gergen (1985), Slezak (2000), and Hacking (1999). Each of these will offer critical perspective.

Writings in Education

In addition to words in constructivist epistemology and social constructivism, a third body of literature to consider are those focused on education. As noted in the opening pages of this chapter, teachers that believe in constructivism generally believe that *knowledge* is formed as part of the learner's active interaction with the world, and that that knowledge exists less as abstract entities outside of the learner but constructed anew through action. *Meaning*, in turn, is

constructed with this knowledge and that *learning*, in large part, is a social activity. Given what

has been noted about constructivist epistemology and social constructivism, it should be clear

how these notions about knowledge, meaning and learning are grounded in what we have

reviewed so far.

Other influential writings are important to note in this context. Jones and Brader-Araje

(2002) note a mixture of influences:

Within educational contexts there are philosophical meanings of constructivism, as well

as personal constructivism as described by Piaget . . ., social constructivism outlined by

Vygtosky . . ., radical constructivism advocated by von Glasersfeld . . ., constructivist

epistemologies, and educational constructivism . . .

Social constructivism and educational constructivism (including theories of learning and

pedagogy) have had the greatest impact on instruction and curriculum design because

they seem to be the most conducive to integration into current educational approaches.

(Jones and Brader-Araje, 2002, online journal)

Cognitive influences. Phillips (1995, 2000), and Windschitl (2002) argue that a helpful way

to consider modern writing on the tradition of educational constructivism is to think of two broad

categories: cognitive and social. The cognitive view maintains that learners actively construct

their own sets of meanings or understandings. It is often held that knowledge is not a *duplicate* of

the external world, nor is it ". . . knowledge acquired by passive absorption or by simple

transference from one person (a teacher) to another (a learner or knower). In sum, knowledge is

made not *acquired*" [italics original] (Phillips, 2000, p. 7).   This is at the heart of what most teachers today believe constructivism to be, with strong links to Piaget (1952) and Dewey (1910).

Piaget's theories of knowledge acquisition (as opposed to his notions of developmental stages) persists today as a basis for constructivism for many. In brief, Piaget believed that knowledge is constructed by first interacting with the environment in terms of an object or an idea. The child (or adult) tries to *assimilate* this object or idea into a currently understood *schema* (mental structure that represents some aspect of the world). If it does not match, *disequilibrium* occurs and the individual tries to *accommodate* the object or idea by creating a new schema.

Among the many relationships between the writings of Dewey and constructivism as considered today, Dewey's descriptions of reflection (1910) are noteworthy, including his five elements of reflective practice: suggestions, problem, hypothesis, reasoning, and testing. According to Gunstone, "These map well onto both the ways science constructivists have described teaching sequences . . . and the ways in which metacognition has be argued to be significant to quality learning" (2000, p. 277).

The accent here is on the personally constructed ideas of the environment of the child and the teacher's role is to help structure this learning process to help correct any inaccuracies or misconceptions (Windschitl, 2002, p. 140). In writing about science education, for example, Appleton and Asoko (1996) suggest the following perspective by the teacher:

- A prior awareness of ideas that children bring to the learning situation, and/or attempts to elicit such ideas

- Clearly defined conceptual goals for learners and an understanding of how learners might progress toward these

- Use of teaching strategies which involve challenge to, or development of, the initial ideas of the learners and ways of making new ideas accessible to them

- Provision of opportunities for the learners to utilize new ideas in a range of contexts

- Provision of a classroom atmosphere which encourages children to put forth and discuss ideas (p. 167)

These steps hold promise for teaching of all subjects, including music.

Social influences. These views are complemented by proponents who are especially keen on the role of social interaction. Drawing from the traditions of social constructivism, the notion here is that knowledge is made by interaction with communities of practice and on the context of mental constructions. Vygotsky's work (1978) is cited prominently in the discussions of social constructivism as it relates to education and educational practice. His well known ideas of meaningful "wholes" as opposed to decontextualized and separated skill-building are notable; so are collaborative techniques and problem-solving. Also of great importance is his notion of the "zone of proximal development" which might be thought of as the difference between where learners are on their own versus where they can be with the help of a "knowledgeable other" (teachers or more capable peers).

Social constructivist approaches also include the use of cultural tools like language, computers, mathematical symbols, maps, and other conventions to mediate learning in social environments. Of particular importance is Vygotsky's view of language as a mediator of higher-order thinking is especially important for pedagogy (Vygotsky, 1978).

Vygotsky's work has formed the foundation of social constructivism in educational

settings. In particular, Vygotsky's emphasis on the role of others, or the social context, in

learning has pushed educators to re-examine the extent to which learning is an individual

process. As explained earlier, prior to the recent interest in social construction of

knowledge, the attention was placed almost exclusively on the individual through

behaviorist and Piagetian educational applications. Vygotsky's theories have turned this

focus upside down by emphasizing the role of the greater community and the role of

significant others in learning. (Jones and Brader-Araje, 2002, online journal)

Cognitive and social categories considered together. Although Phillips (1995) and

Windschitl (2002) suggest that it is important to determine if teachers consider either a more

cognitive (individual) versus social perspective in terms of their pedagogy, it is likely that both

can be considered together. For example, von Glasesfeld, a scholar noted for his strong roots in

Piagetian thought, notes:

> Knowledge is never acquired passively, because novelty cannot be handled except
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> through assimilation to a cognitive structure the experiencing subject already has.
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> Indeed, the subject does not perceive an experience as novel until it generates a
>
> perturbation relative to some expected result. Only at that point the experience may lead
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> to an accommodation and thus to a novel conceptual structure that reestablishes a relative
>
> equilibrium. In this context, it is necessary to emphasize the most frequent source of
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> perturbations for the developing cognitive subject is the interaction with others. (von
>
> Glasersfeld, 1989, p. 136.)

As we approach the literature in music teaching, a key for the reader will be to ask how the intended learning is imagined to be structured for the individual. For example in general music classes, are the techniques used for music listening or music composition based on a desire to develop individual skills and knowledge or are group techniques used for a more collected view, perhaps at the expense of individuals? If both positions are maintained, is there clarity on how the learning is constructed by each student?

Further readings on the constructivist tradition in education, including writings that provide cautions and critical positions, see Duffy, Lowyck, and Jonassen (1993); Fosnot (1996); Phillips (2000); and Steffe and Gale (1995).

Summary: Implications for Music Learning

In this brief overview of the background of constructivist writings from philosophy, sociology, psychology, and education, it should be clear that there are many issues that challenge practitioners and researchers interested in deeper levels of student learning in music. Everything about teaching the music experience seems to be affected, from the very music we choose (and why we choose it) to the ways we ask our students to interact with each other. How we physically organize our rooms for teaching to how we assess process/ product—it all invites re-evaluation in the face of constructivist thought.

1. **How is musical meaning constructed?**
2. **How am I using students to teach one another?**

3. **How do we honor the experiences that student themselves bring into the classroom?**

4. **How (or should) we use language in different ways to mediate learning in musical environments?**

5. **And what music should we choose to feature--multiple styles, cultures?**

6. **What about the balance between process and product?**

7. **Most importantly, how do I know that such an approach is effective?**

Phillips (1995) raises other concerns. A major one is the position a teacher takes in terms of comparing "discovered" learning to the prevailing views of a discipline or a social body. In other words, in thinking about the constructive process:

> . . . is the knowledge 'imposed' from the outside; does nature serve as the "instructor" or as sort of template that the knowing subject or subjects (or community of knowledge builders) merely copy or absorb in a relatively passive fashion? In sort, is new knowledge—whether it be individual knowledge, or public discipline—*made* or *discovered*. [italics original] (p. 7)

For music experiences, this has enormous implications for how music teachers work in constructivist environments. Is it clear where a music teacher stands in terms of the discovery of principles of music theory, for example, that might be defined by the canon of practice? Is this canon the goal or is a more liberal affordance allowed or encouraged? A position that understands how to teach music for personal expression and how to balance technical information with more important aspects of music is key. Constructivism is not a curriculum, it is about what

one knows or needs to know. It is about how students learn and teaching for learning. This requires a very skillful teacher.

8. How do we reconcile constructed knowledge that emerges from students that seems to be at variance with accepted aspects of music knowledge?

Another issue relates to the extent one believes in *active* construction. What does the word "active" imply? Is it enough, for example, for children trying to understand baseball to watch games and talk with parents or siblings to construct an understanding of the rules, or must one actually play baseball to actively construct knowledge of the game. This raises interesting questions of the "embodiment" of knowledge in a constructivist context and, for music teachers, raises interesting questions about practical approaches to the construction of knowledge for music experiences of all types. If a music educator claims that he or she is helping children understand music constructively by teaching them to perform, is this active engagement enough to convince us that the children are constructing their own knowledge? The same question can be asked of those teaching music listening or improvisation.

> For the constructivist, formal learning is a matter of interpreting and re-interpreting one's primal body experiences – and, hence, a main concern of teaching is the provision of rich activities that might be interpreted. Constructivism thus rejects the ideal of a body held still and forced to face one direction in a rigid desk – a model of the learner that rests on the notion that learning is a mental activity which requires the suppression (rather than the participation of the physical.) Implicit in this conception of embodied knowing is an acknowledgment that bodily action is not simply an external demonstration of

internalized understanding. Rather, bodily action *is* understanding as a knower seeks to maintain fit with her or his circumstances. (Davis, Sumara, & Luce-Kapler, 2000, p. 66)

9. How "active" does one need to be in music to construct knowledge?

Finally, Windschitl (2002, p. 133) raises questions about certain practicalities related to cultural and political dilemmas that face teachers that attempt to promote constructivist learning. For example:

10. How do I reconcile learning objectives from existing/required curriculum guides and still support constructivist learning?

11. How do I blend the need to prepare my students for musical performance while working to achieve some measure of constructivist learning?

12. With so many approaches to encouraging constructivist thinking (Webquests, project-centered learning, computer-assisted composition/improvisation, others), what do I chose?

13. Can I trust students to accept responsibility for their own learning?

14. How do I change my thinking of not being center stage as the central focus of learning?

15. How can I gain the support of parents/administrators for such an approach to teaching music?

We now turn to the current literature in music teaching and learning to find guidance for some of these questions.

The Case for Constructivism in Music Teaching and Learning

It is perhaps surprising to some that more has not been said about the role of constructivist thinking in arts and humanities education among the many volumes that have been written about constructivism generally. One chapter by Greene (1996) appears in Fosnot's compilation on constructivism in which Greene lays out her beliefs about a person's construction of meaning in the arts and her strong belief in the role of creative expression in children:

> Yes, children do create meanings by using paint brushes, pieces of chalk, triangles, gongs, by making shapes with their bodies in time and space. They construct what are accepted as 'unreal' worlds by improvising in theatrical spaces; coming together, they often engage in the construction of distinctive social realities that they can comfortably inhabit, while such realities remain unrecognizable by those 'outside.' (p. 123)

Despite this one example, writings about science and mathematics education clearly dominate the "action" in discourse about this topic. Perhaps the reason for this is that most scholars assume, quite incorrectly, that educators in arts and humanities deal with constructivism routinely in their teaching. After all meaning making, particularly in the arts, is a very personal affair by nature—actively constructed. Far better to concentrate on the sciences and mathematics to make the case for constructivism since the content of these disciplines is so strongly based in what some believe as unchallengeable truth that the discourse will be more controversial and perhaps more compelling a case if made well; hence, writers have chosen to focus on science and

mathematics as the battleground. Perhaps, too, some imagine the stakes to be higher in such contexts.

Regardless of these assumptions, it is safe to say that the field of music education practice has for years been dominated by directed instruction that is top-down in nature, often with little regard for student-constructed knowledge. It is only in the last ten or fifteen years that writers in music education have begun to consider seriously the practice of music teaching and learning from a more constructivist perspective. For this reason, much of what follows does not deal directly with the questions raised in the summary of the past section.

Conceptual Writings

Specific implications of constructivist thinking have not garnered the attention of the primary thinkers in music education philosophy in North America. Reimer, in this latest text on music education philosophy (2003), did spend considerable time with aspects of postmodern thinking, with special attention to matters of social context and the role of creativity and creative roles in music education. In so doing, he honors important aspects of constructivist thought; however, constructivism and its place in epistemological thinking is not a central part of his synergistic positions. Elliott (1995) noted the importance of self-knowledge and the construction of knowledge, but does not pursue the issue in depth as a basis for his philosophical thinking. In her essay on philosophical foundations in the first *Handbook of Research on Music Teaching and Learning*, Stubley (1992) mentioned constructivism as part of a section on nonpropositional knowledge (pp. 6-7), but it is not developed significantly as a basis for music education practice.

From the British perspective, Swanwick does not argue specifically for this theory of instruction, but he does advocate for the importance and centrality of composition and improvisation in schools (Swanwick, 1979). The seminal work by Paynter and Aston (1970) on the importance of creative music making by children in the context of composition is important. They write: "If any one aspect of education today is characteristic of the whole, it is probably the change of emphasis from children being instructed to children being placed in situations where they can learn for themselves" (p. 5).

Music education policy and curriculum developers in the United Kingdom, and to some extent in Australia as well, have demonstrated a major commitment to curricula that have endorsed music composition and improvisation in schools for much longer than in the United States and Canada, however, and this has influenced much of the British literature related to constructivist thinking. For example, Burnard (2000) writes eloquently about children's own thinking and meaning-making about composing and improvising and this work is underscored by an implicit endorsement of the importance of constructivist approaches.

There might not exist a substantive engagement by the the primary philosophers and theorists in our field, but there are a few others that have offered explicit foundational work. There voices are summarized below:

Shively. Joseph Shively (1995) contributed an extensive theoretical study on the possible application of constructivist thinking to a beginning band environment. This dissertation represents one of the most thorough reviews of contemporary constructivist thinking in the music education literature and provides an extensive rationale for how to approach the implementation

of a curriculum for beginning band with this epistemological perspective. Although the ultimate focus of this study is on the rationale for a beginning band program, much of the study could serve as a more general treatise on the issues of constructivist thinking for many other curricula in music education.

The study grew out of a realization that new theories of instruction were needed to help ground beginning band instruction in a perspective other than the objectivist, teacher-dominated approach. Research questions that guided the study were centered on: (1) how contemporary constructivist positions can assist in answering questions about knowledge—its construction, influence by environment, and transfer; (2) how the answer to these questions might contribute to principles of instrumental music teaching; (3) what the implications of these principles might be; and (4) how can all this be applied to a framework. Wisely, Shively stops short at providing specific objectives or extensive procedures for practical application since a constructivism theorist would see this as not generalizable.

The constructivist positions that are defined are ". . . limited to those views that are seen as the most meaningful and potentially applicable to beginning band instruction" (pp. 14-15). A study of those constructivist positions that are reviewed by Shively and those that appear in the opening section of this chapter will reveal some overlap and some that are new in the Shively accounting. The following is a short listing of types of specific constructivist positions described by Shively that a careful reader might enjoy exploring in some depth, especially if considering a basis for instrumental music:

- Ecological psychology and constructivism blend (Cognition and Technology Group at Vanderbilt)

- Cognitive Flexibility Theory

- Emancipatory Constructivism

- Extreme Constructivism (separate from von Glasersfeld's notion of Radical Constructivism)

- Idea-based Social Constructivism

- Simmon's Memory Representations

With the understanding that there is considerable disagreement among constructivists and that the intersections of the various positions are often hard to parse, Shivley sorted through those positions he felt were most pertinent and arrived at the following set of learning principles upon which his framework was based:

1. Learning is the process of making meaning out of one's experiences; it is knowledge construction.

2. Learning should always be grounded in a constructivist approach.

3. Learning is enhanced by engaging learners in experiences reflecting practitioner culture.

4. Learning is enhanced by engaging the learners in experiences involving individual and group knowledge construction.

5. Learning is enhanced by engaging learners in experiences reflecting multiple perspectives.

6. Learning is enhanced by the individual distributing the process of knowledge construction and the resultant knowledge base among other individuals and artifacts.

7. Learning is enhanced by experiences encouraging the reflexive use of a learner's knowledge base. (pp. 76-77)

Following the presentation of these principles, Shivley weaved a careful construction of how aspects of the music experience—notions of domains of knowledge, musical representation, and musical context for example—would interface with principles in terms of a music program of any type. In this portion of his study and in the section on music knowledge and how it can be understood, Shivley pointed to the writings of Nelson Goodman, particularly *Language of Art* (1968) and *Of Mind and Other Matters* (1984) as one approach to a constructivism of art. Shivley clearly believes in the role of symbols as important for the constructive process (p. 83). It is in this section too that issues of representation (music performance, composition, improvisation–indeed the notion of creative thought in music) are given a base in a conception of constructivism in music teaching and learning. Other contemporary topics in music education discourse are considered here such as cultural perspectives in music, role of music notation, and emotion and cognition.

> Simply stated, the constructive process in the knowledge domain of the instrumental music performer revolves around the musical decision making process. From the first experience with music, all knowledge that is constructed within the domain of the instrumental musician serves as a tool in the musical decision making process. It is the active use of music knowledge that leads to a depth of understanding, which is reflected in representation through performance primarily; of course the experiences in other domains should continue because they afford the learner opportunities to represent their knowledge in other ways, thereby deepening their understanding of music. (p. 93)

Shively noted the controversy among constructivist theorists about whether *all* knowledge is constructed. He opts for the position that all knowledge *is* constructed but maintains that an important question might be: can all musical decisions be made by the learner (p. 96)? Issues of the previous experience of learners with music as they enter the world of instrumental music instruction are then discussed and examples of some teaching strategies for beginning instrumental instruction are described in relation to constructivist teaching (p. 99). Not unexpectedly, teacher modeling is stressed as is the importance of problem solving.

All of this and much more dealing with social context and the reflexive nature of music knowledge led to an extensive treatment of the role of the actors (learners and teachers) in a beginning band program. Notions of collaborative learning, situated cognition, authentic learning, cognitive apprenticeship, scaffolding, multiple perspectives and other instructional design issues were considered. Approaches to assessment were also treated in this context. The study ended with a presentation of the framework itself which is divided into three section: (1) background, (2) development , and (3) process (p. 171). Each part of the framework is presented in detail having been prepared philosophically by the sections described above. The study concluded with this notion:

> While this study focused on the implications of constructivism for learning, the development of a philosophy of music education with constructivism as a foundation should be pursued. The work of Jerome Bruner, Elliott Eisner, and Nelson Goodman should provide material to aid in the articulation of a constructivist philosophy of music education. (p. 213)

Wiggins. Perhaps the most prolific and effective advocate for constructivism in music

teaching and learning in North America has been Jackie Wiggins. Her text (Wiggins, 2001) on

teaching for musical understanding was designed as a resource for general music teachers, but it

functions more as an example of the application of constructivist ideas to music teaching of all

kinds. In the opening chapter, Wiggins makes a case for music learning on the basis of social

constructivism. Using her extensive experience in schools working with children, she provided

valuable suggestions for designing lessons that build on common constructivist teaching

strategies, including problem-solving and cooperative learning. Creative projects were stressed,

especially music composition.   Both Wiggins and Shively help in providing some answers to

questions about how best to manage student-constructed knowledge with standard music teaching

objectives.

Other Writers. Abrahams (2005) offered an important perspective on constructivism as a

strong partner to "critical pedagogy." Citing the work of Freire (1970) as inspirational for critical

pedagogy, Abrahams reminded us that:

> Critical pedagogy is concerned not only with the students and the change that occurs in
>
> them as a result of the learning, but also with the change that occurs in the teacher. In
>
> critical pedagogy, not only do the teachers teach the students, but the students, in turn,
>
> teach the teacher. This effects a transformation of both students and teachers.
>
> (Abrahams, 2005, p. 13)

This is a critical point that sometimes is missed in the literature. Critical pedagogy, for Abrahams, is based on the sociotransformative constructivism of Rodriguez (1998) (a type of social constructivism that deals with the multicultural dimension) and experiential learning theory. Experiential learning, according to Abrahams, adds the element of critical feeling and action. The article included an interesting example of a unit of instruction for young children that uses connections to family, an exercise to create musical instruments, and a visit by a student performing group to help frame a learning experience about families of musical instruments. Steps in the lesson are tied to critical pedagogy.

Boardman's writing about a generative theory of music learning, based in part on the writings of Bruner, is important to note (Boardman, 2001). Her application of Bruner's enactive, iconic, and symbolic modes of representation were supported in practice by endorsement of constructivist notions of constructed meaning, social context, and holistic music experience (p. 52).

Hanley and Montgomery noted the importance of constructivism in a comprehensive chapter on curriculum (2002). In an opening article to a special issue of the *Music Educators Journal* (Hanley & Montgomery, 2005), they maintained that: "A new view of curriculum that focuses on understanding practice and experience has been emerging, and curriculum is being reconceptualized. . . ." (p. 18). They maintained that this reconsidered curriculum should reject older, positivistic notions and embrace a quest for understanding, collaboration, inquiry, a focus on why, and a learner-centered focus. Constructivism was noted as a meaningful conceptual base. Barrett (2005) follows in this special issue with a number of suggestions for opening curricula to

more postmodern thinking.   Of importance are her suggestions for community involvement,

collaboration, and assessment:

> For the proposed sixth-grade general music course, students might conduct oral history
>
> projects in which they interview and observe community musicians who represent
>
> diverse musical styles. They might collaborate with one another in all groups, work
>
> individually, or contribute to large-group presentations of their findings. The panoramic
>
> ways that students work in music and on their own understanding give teachers many
>
> forms of evidence for assessing learning. An important constructivist technique is
>
> inviting students to derive criteria by which their work will be judged. (p. 25)

Others have written passionately about the role of constructivism in music education. Ellis

and Fouts (2001) felt that constructivist thinking is central to interdisciplinary curriculum design,

linking the approach to a progressive philosophy that celebrates creativity, "naturalistic learning,"

and real-world achievement (p. 23). Barron (2007) argued for a constructive approach in teaching

jazz by engaging students in authentic, musical problem-solving experiences with improvisation

that include familiar tunes. Scott (2006) believed that constructivism is the key to deep learning in

music if done with seriousness and care. However she also maintained that surface attention to

this approach creates a *pseudo-constructivism* within an otherwise teacher-dominated

environment. In another publication (Scott, 2007), she also made a strong case for constructivism

as a foundation for inquiry-based research in music classrooms. Citing the music classroom as a

collaborative learning context, she argued that:

An inquiry-based approach requires that questions or problems for investigation be

negotiated among the members of these communities. Doing so requires that students

and teachers consider multiple viewpoints as they reflect on and respond to the ideas of

others. No single person holds all the questions and answers. . . The primary role of

music teachers is to model the thinking processes and tools of musicians and to facilitate

each student's learning as they explore musical questions or problems. (p. 36)

This, of course, is a radically different way to imagine conducting a general music class or a

rehearsal of an ensemble in schools and challenges music educators to directly employ

constructivist principles, but she also noted that student-initiated questions which might begin this

research process might be integrated into more teacher-directed procedures.

Given the wide and deepening literature in education and constructivism, especially in the

science and mathematics subjects, it seems unfortunate that there is not more conceptual writings.

As interesting as these contributions are, music education—especially in North American—

remains surprisingly unengaged in intellectual discourse about such topics.

Constructivist Thinking and Music Teacher Preparation

Music teacher educators are beginning to explore and apply sociologically based

theoretical models throughout teacher education curricula that are effectively prompting

undergraduates to assume greater responsibility for their professional development.

During the Symposium on Music Teacher Education in September 2005, a number of

presenters offered several innovative and successful approaches that revolve around a

common educational principle: teach for independence. Some presenters described constructivist strategies to address how teacher candidates think, while others presented role-development strategies as means of facilitating how teacher candidates think about themselves as professionals. (Teachout, 2005, pp. 2-3)

A major part of what conceptual literature in music we have on constructivism centers not on the role of this learning theory for students but rather its function for teacher preparation. Wiggins (2007) reminded us that undergraduate teacher preparation programs must also operate in constructive ways if we want to improve music teaching.

Reflective thinking has become an important part of discussions in teacher preparation and in refining teaching practice. The writings by Schön (1987) on the subject of reflection owed their origins to constructivism as much of the music literature in music education attest. Stegman (2007), for example, studied the content of 49 interviews and reflective dialogs between six student teachers and their cooperating mentors. Guiding questions for the reflections centered on events selected by the student teacher and included queries about success or failure of the events as well as thinking and feeling. Technical, clinical, personal, and critical comments were coded for analysis. Results showed that all six student teachers were positive about the reflective process and two demonstrated major improvements in teaching over the term. Such reflection demonstrates that students can construct an understanding of teaching which can lead to improved practice. Berg and Lind (2003) reported similar success with reflection and constructed meaning with a group of undergraduates who used reflections in the context of electronic portfolios. Wiggins and her associates (Wiggins et al., 2006) noted that: "Constructivist ideas underlie the

reflective practice movement in teacher education . . . and we have embraced these ideas in music teacher education" (p. 83). Bauer and Dunn (2003) reported on a constructivist-based project on reflection using electronic portfolios. Students in a teacher preparation program were asked to document and reflect on their teaching experiences throughout their training using web-based tools.

Reflective practice is not the only theme in teacher preparation that is touched by constructivist thought. Campbell and Brummett (2007) provided a description of the mentoring process for pre-service teachers:

> The culture of mentoring we envision here requires each of us to reposition our thinking so that it's more in line with constructivist perspectives of learning . . . Orienting programs away from traditional master-teacher or technical models toward those focused on developing reflective practitioners may better prepare young teachers for innovation and inquiry-based forms of continuing professional development. In addition, we see this theoretical foundation as sympathetic to personal and critical orientations. (pp. 51-52)

What is impressive about this writing is that it focused on collaborative discussions as mentoring throughout one's career, moving from viewing the mentor as a model, then coach and critical friend, and then as a co-inquirer. This underscores the social constructive nature of knowledge acquisition.

Constructivism in Practice

Before turning to the research-based literature, it is important to review a few of the many writings from teachers in the field who have reported on the conscious use of constructivist techniques in their practice. We begin with examples from the classroom and then offer other perspectives that are rooted in the private studio and rehearsal hall. In many of the article summaries that follow, the student-centered classroom is celebrated and students are encouraged to participate more vigorously in what is being taught. As Brown (2008) reminded us:

> . . . student-centered instruction is when the planning, teaching, and assessment revolve around the needs and abilities of the students. The teacher *shares* [italics original] control of the classroom, and students are allow to discover on their own. This does not mean that the students are in control of the classroom, but rather that they have some influence in the decisions that are being made about their leaning. . . students are involved in creating strategies that teachers can use. In fact, some of the best teaching strategies come from students, because the students are the ones that are being taught. (pp. 30-31)

Wiggins. Again, we return to the many contributions by Wiggins in terms of music composition in the schools (Wiggins, 1990). In an article about the place of revision and extension in music composition (2005), several vignettes are offered that demonstrate the interchange between student and teacher in a constructivist discussion about composition. In the examples offered, the social interaction between students working in groups is seen as an important part of the revision process.

Scott. In a somewhat related context, Scott (2008) portrayed a teacher, Joan, who is experimenting with inquiry-based learning. Joan works in a school where a cross disciplinary theme exists focusing on the question, "How do we see the world in which we live?" A unit called "Sound Escapes" (title derived from the idea of escaping teacher-centered learning) emerged as Joan worked with students compositionally around the idea of sounds of music as part of our everyday experience. The article described the steps taken by the teacher and the children as they explored "soundscapes" that portray the wind, images from books and poetry, and experiences from the student's environment. Students also listened to music written by others in a similar vein.

> . . . Joan assumes a stance for inquiry in which musical problem solving (e.g. "What will the birds sound like in the composition?) is driven by the students. She interacts with the students as she deems necessary, sometimes offering direct feedback (e.g. "You said your composition is in ABA form but it seems to me that it is ABC from," or "What would happen if you layered the entry of instruments in the repeat? Why don't you try that?"); other times asking open-ended questions that encourage students to examine their compositions in new ways. (p. 15)

Hanley. Hanley (2003) profiled a unique approach to a graduate class for masters students in music education. The article is narrative in style and explains the author's approach to a course on musicianship and pedagogy. The course was a three-week course, offered in the summer for teachers, and was designed to two parts. The first part focused on the music of selected 20th century composers, labeled as "postmodern" by Hanley and included works by Debussy,

Stravinsky, Webern, Satie, Milhaud, Babbitt, and Freedman among others. This music served as a way to have students construct their understanding of issues of style and content. A projected-centered approach was used, modeled after the "domain project" in Harvard's Project Zero.

> Part A of the course provided students with opportunities for the production of music, the
>
> perception of music, and reflection on their musical experience while
>
> they explored the central concept of style in music, and, to a lesser degree, in other arts.
>
> Understanding was at the heart of this course, as we explored the meanings of style,
>
> including stylistic characteristics and change. What is style in music? What is the role of
>
> social context and history in the evolution of style in music? What is culture? What is the
>
> Canadian identity? These are some of the questions we explored. (p. 96)

Part B of the course was concerned with curriculum issues, particularly with constructivist approaches and teaching for musical understanding.

> Since beliefs and current understandings are so important to learning, I asked students to
>
> articulate their assumption about music education, draw a concept map showing their
>
> current understanding of curriculum. These assignments were shared and discussed,
>
> providing some surprising revelations about self (especially in the self-portraits, which
>
> ranged from traditional teachers to facilitators who where nearly invisible in the
>
> drawings) as well as a basis for further learning. (p. 101)

Hanley describes other topics in Part B of the course to include the political side of curriculum, including questions about what is school and whom does a school serve. Positivist

and reconceptualized curriculum trends were discussed (Hanley & Montgomery, 2002).

Constructivist approaches to learning were discussed based on the article by Windschitl (2002).

A final topic in this portion of the course was the Teaching for Understanding initiative as

documented by Wiske (1998).

Throughout the article, Hanley included sidebars about teaching moments (some in which

she is openly critical of herself) and reflections about her students and their thinking. One

emerges from Hanley's description of her class feeling what it must have been like to be a student

in the class of a master teacher, creating a platform for constructed meaning. She concludes this

way:

> In both parts of the course, teaching for understanding (as experienced and as
>
> constructed) was one overarching goal. The domain project on style allowed students to
>
> produce, perceive, and reflect on music that illustrated both modern and postmodern
>
> thought. In the curriculum component, we examined positivist (modern) and
>
> reconceptualized (postmodern) curriculum conceptions and attempted to understand that
>
> theory and practice are embedded in each other.
>
> . . . We focused on curriculum as institutionalized text as we developed TfU units for
>
> constructivist classrooms. Breaking away from past practice while respecting one's
>
> experience was (for most of the class) both stimulating and perilous. Not surprisingly, we
>
> concluded with many questions.   (pp. 109-110)

Cutler. In terms of the private studio, Cutler (2002) provided profiles of fiddlers and their experiences learning to play their instruments in informal ways. She reminded us of how these country musicians often learned to play simply by imitation on their own in very personal ways with no active teachers. Cutler agued that the student voice in string teaching needs to be recognized. The descriptions provided remind the reader of similar accounts by Berliner (1994) for jazz or by Green (2002) in describing the ways informally trained musicians learned popular music. Although these various accounts of music learning in informal settings are not referenced always as connected to notions of constructed learning and learning in communities, they are prime examples of constructivist thinking.

Zarro. Writing in the *NACWPI Journal*, Zarro (2003) provided a side by side comparison of how a constructivist applied teacher functions as opposed to a traditional one.

> The applied instructor of a traditional studio seeks to mold the student in their likeness. Their curriculum is based on their own experiences as a student and performer. Thus, the main concern is not attaining what the student hopes to learn, but that which the instructor defines as being imperative. . . . The constructivist teacher in an applied studio focuses their attention solely on the student. Their experiences are not important, but what is are those the students develop on their own. (pp. 4-5)

The notion above that the teacher's importance is not important is over-stated, since most accounts of constructivism celebrate the teacher as a critical engineer of successful teaching; however, the point here that the students develop their own musical decision making is the critical one. Zarro made the case for a combination of private and group lessons. Group lessons are seen

as problem-solving venues with peer comment as important to learning[2]. Constructivist applied teachers may also ask students to compose exercises on their own or use computers or portfolios as tools for learning. Assessment is much more of a collaborative affair and may include an evaluation of how the student reasons through problems and plans for improvement—looking toward a time when the instructor is not around.

Peterson. Finally, what about ensemble instruction? Peterson (2004) wrote about the value of a constructivist approach for leading the elementary school musical. After a review of constructivist literature, she described her work with mounting the musical "Compose Yourself," a work that centers on master composers of the past. Below are two types of learning content, one non-musical and the other musical, that speaks to the point:

> We researched the styles of clothing in the Baroque, Classical, and Romantic periods. This led to comparisons of the life of Beethoven to that of George Washington during the American Revolution. Theses types of discussions encouraged further inquiry into the inventions and other famous people of the day.
>
> Once the objective had been determined, I needed to discover the students' understanding of key musical concepts before sharing my own understanding of those concepts. . . . For example, if the pitch was flat at the end of a song, in the past I might have simply stated that they were flat. In as constructivist setting, I needed to ask an open-ended question to encourage conversation and reflection. So I asked, "how do you feel about the way we ended that song?" (pp. 13-14)

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[2] For an extensive treatment of cognitive apprenticeship ideas in the music teaching studio context, see Kang (2003).

Broomhead. In writing about his work with older students, middle and senior high choral students, Broomhead (2005) provided an articulate account of the importance of constructivism in teaching expressive singing independence. He recounted the disappointment he had in hearing one of his best high school groups—a group that he had taught since 8th grade to sing so expressively—prepare a piece of choral music independently and perform it with no noticeable attention to phrasing and expression. What went wrong? Why could they not do what they are so capable of doing? Broomhead realized that it was the ensemble's reliance on him. He had not taught for musical independence. In the article, the author provided three important suggestions for improving expressive independence that can be done within the structure of the director's day: small group work, formal phrase-shaping practice, and informal phrase-shaping practice. In each set of activities were embedded concrete suggestions for improving musical independence. An important part of the article was the plea for developing these experiences over time:

> My earlier work with eighth graders revealed a surprising level of expressive consensus among students and a surprising ability to quickly achieve expressive unity. My later experience with older students revealed that students need more than a brief curriculum unit if they are to develop expressive independence. Constructivism reveals that if students are to develop accurate understandings of concepts, they need regular and ongoing problem-solving opportunities and responsibility. (p. 67)

Pearce. Pearce (2005) chronicled yet another example of project-centered learning that owes much to constructivist thought. Here the setting is the a middle school band program in Denver,

Colorado. The focus is the life and music of Paul Whiteman, a resident of Denver. Pearce's idea

was to have his band (and himself) construct some understanding of this famous band leader in

the early 20th century by doing research, listening to his music, and performing some of it as well.

Pearce described his leadership in having the students visit local history societies to study

materials and to encourage students to interview friends and family members who might have had

some knowledge of Whiteman's time in Denver. The Internet played a role, as did local flea

markets that had memorabilia. The music of George Gershwin was featured in a concert by the

students.

> Though it required considerable effort on everyone's part, having band students explore
>
> Paul Whiteman and his music through constructivist learning has provided them with a
>
> deeper, clearer understanding of a musician. It gave them knowledge of his contribution
>
> to our society, his artistic limitations, and his strengths and weaknesses. They learned
>
> much more than they would have if our approach had been to hand out, rehearse, and
>
> perform a "song by some dude who used to live in Denver." (p. 44)

In each of the more practical examples above, we see models of teaching process that owe much

to the desire to teach for a deeper understanding. In an article by Shively (2004), several teaching

strategies were listed that are hallmarks of constructivist teaching. These include acceptance of

student autonomy, use of terms such as "classify," "predict," and "create," allowance for changing

lessons based on student questioning, poll student understanding prior to instruction, encourage peer

interaction, and promote active discussion of different perspectives (pp. 184-187). The short

sampling of more practically-based writings here demonstrate how music teachers are beginning to

document these approaches. What seems lacking in most of this writing is a critical perspective on how well these practices actually work.   Unfortunately, in the section that follows on empirically-based research—a body of literature that one might expect this kind of evidence—the there are more questions than answers.

Empirical Research on Constructivism and Music Learning

We turn now to a summary of the actual empirical work on music learning done using constructivism as a central focus. This summary does not include the vast literature on creative thinking in music[3] which, by its very nature, is related either tangentially or quite closely to constructivist thinking. Much of the work done on music composition in the schools is related to constructivist ideas but, unless the researchers focused directly on the construction of meaning and social interaction, that work is not reviewed here. Certain studies make reference to constructivist thinking as part of their conceptual framework, but focus mainly on other interesting questions. For example Della Pietra and Campbell (1995) refer to constructivism in the opening pages of their work on improvisation, however their contribution centers more on the understanding of improvisation and less on the dominant role of constructivism per se.

Studies are organized into four divisions and into constructed music learning in: (1) elementary and middle school, primarily with focus on general topics of music learning and teaching; (2) instrumental and ensemble settings from high school; (3) college-aged students, particularly those preparing to teach, as well as adults; and (4) the world of technological

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[3] For an annotated bibliography of the literature on creative thinking in music, see the author's compilation at: http://musicalcreativity.com/?cat=7

application across all ages. I provide a summary and reaction after each section as a link to summary questions that emerged at the end of the general literature section.

Elementary and Middle School

Lim. Lim (2005) completed a qualitative study on the sociocultural and musical influences on children's construction of musical knowledge. Her setting was a set of three elementary schools, three music teachers, six music classrooms, and a professional community orchestra program—all in the Milwaukee, Wisconsin area. The schools were well known for their progressive philosophy and the teachers were experienced music educators. The music curriculum was noted for its attention to the principles of Boardman's Generative Approach to Music Learning (GAML) and to community arts initiatives. Lim was interested in how music learning was mediated by tools and people and what were the contextual factors that served as a constraint. What musical knowledge children constructed in their settings was also of interest.

Data included observation/field notes, student journals and other artifacts, video and audio tapes of classes, and interviews with teachers and students. Observations of the first and second grade music classes totaled 122 hours. Data analysis involved coding and recording of emergent themes. The study contained detailed descriptions of the tools used by teachers and students to construct meaning and documents the interactions between teachers, students, and the resources. Lim found that the tools and people did mediate musical knowledge construction to a great degree. A shared framework for interpreting musical experiences was noted, along with the development of domain-specific knowledge. She encouraged music teachers to select a smaller repertoire of music to study in depth and to teach music elements within the context of the whole.

Whiteman. Whiteman (2008) reported a study of preschool-aged children engaged in spontaneous singing and how they interacted with a "knowledgeable other" (in this case the interaction with other children as peers) over a three-year period in a child-care center. Participants were eight children who were ages two and three at the start of the study; all children were studied for two of the three years, but three of the children left the research to go to regular school at the beginning of the third year. The purpose of the study was: ". . . to ascertain the social interactions that occur during preschooler's spontaneous singing and to determine the effects of these interactions on the acquisition of musical knowledge and skills" (p. 27).

Spontaneous singing was recorded on videotape during free play time in the mornings over the three year period. Songs were transcribed into Western notation with the addition of diacritics for microtones and glissandi. Dataset included 443 songs added to a database linked to comments on the social aspects of the play episode based on established theory. Three types of "knowledgeable other" influences emerged from the data as children corrected each other, modeled songs, and invited peers to join in the singing. The study provided a detailed description of the nature of each of these knowledgeable other phenomena. Music notation for the songs is provided for examples. Whiteman concludes:

> The children demonstrated that within their cultures, it is not always an adult who acts as the knowledgeable other nor is it always the oldest child in the group who assumes or is assigned this role. Cultural maturity or experience with cultural sings, it seems, is not necessarily dependent on chronological age. Throughout the study, a range of children of

varying ages both scaffolded and were scaffolded as they musicked within their zones of proximal development. (p. 39)

Loren. Loren (2003) worked with fifth-grade general music students. His interest was in collaborative construction between himself and his students and its effect on motivation in his class. His study was a narrative account of his efforts to work with 22 students over an 18 week period in developing learning activities that might meet state and national standards. Research questions at the start of the action research narrative centered on the empowerment of students and its effect on motivation, suggestions that students offer to make the work interesting, and the role of the teacher in all of this. The theoretical base of this study was social constructivism.

The study occurred over a six-week period where the researcher served as a guest teacher. Students attended class for thee days a week for a total of 18 classes. Learning projects were suggested to the children according to specific learning goals and according to student interests. Students had a voice in the kind of project they wished to do in small, collaborative groups. Data sources included: video recordings that were transcribed, field notes, student work, student interviews, artifacts, teaching journal, and two student surveys. The surveys were used to establish a starting point for student attitude.

Project-based activities occurring in small groups developed during the six weeks. Groups created two projects, all developed cooperatively between the teacher and the students. The study documented the developing power relationships within the classroom, student autonomy, goal setting and motivational issues. Loren described the successes of collaboration and the difficulties that surround difficult student behavior, poor organization, and incorrect amounts of

intervention. Students generally liked the cooperative work since they perceived that they got things done, but also noted that it was a great deal of work.

Indeed, students responded favorably to the opportunity to direct their own learning. However, learning strategies alone do not necessarily develop student's interest in learning. Even when children had the opportunity to shape learning activities according [to] their interests, intrinsically motivated learners was not a guaranteed outcome. A few students still required teacher intervention to remind them of the learning expectations that accompany the pursuit of their interests (p. 193).

Carroll. Carroll (2007) was also interested, at least in part, in the social interactions of children but her work has focused mainly on the products and processes of using invented notation. Basing her work on previous studies of invented notation, Carroll sought to discover what the features of the notational systems were that children created to represent the songs they had learned to sing. Of particular interest were the musical dimensions of, for example, pitch, duration, and phrase groupings. She was also interested in how the children used resources available to them to do the task. Of great interest were the ways children sing back the song, explain it to the researcher, and teach the song to a classmate. The theoretical framework for the study was drawn from the social constructivist perspective, especially the notions of self-regulation and mediation.

Carroll used the qualitative technique of portraiture as a methodological frame for the study. This techniques involved the use of context, voice, relationship, emergent theme, and aesthetic whole as organizing elements. She asked 13 children, ages 5-9 to notate a song they learned to

sing during a previous week. They were asked to sing it back, explain what they did and then teach the song to a classmate the following week. Children were drawn from schools in Montreal, Canada. Data included the children's notations, video tapes of their actions as they made the notations and taught them to a classmate. Carroll studied the resources the children used to do all of this.

Results indicated that children were able to use invented notation to notate the song and that they refined these notations when singing the song from notation. They also refined the work when teaching it to others. Interaction with classmates was especially important.

> Analysis of the children's notations, verbal explanations and teaching strategies provided insights not only into what they knew about music, but also their appropriation of the cultural conventions of writing and their aesthetic sensibilities, as gleaned from their choice of symbols, colours and how they presented their symbols on the page. . . This study shows the value of adopting a social constructivist approach to teaching the language of music. It also demonstrates that researching the products and processes of children's invented notations from a social constructivist perspective enables more detailed portraits of children's musical and meta-cognitive understandings. (p. ii)

Wiggins. In a study on the notions of shared musical understand and independent music thinking, Wiggins (1999/2000) used a theoretical sampling technique based on a return to many earlier studies done by herself and her graduate students and to a newly-collected set of data from a third-grade classroom. Over 600 audio and video tapes were reviewed. Six instances in which

students were composing or improvising with peers and/or a teacher were identified as ". . . particularly successful student work" in the data sets (p. 66.) The purpose of the study was to study these instances for what they might say for shared meaning and independent musical thinking. Using the literature outside of music education on the nature of shared experience in learning and literature in music education done previously that contained some evidence of shared social construction, Wiggins arrived at several key points that served as a conceptual base. Among these included key beliefs above how an individual constructs knowledge with the help of others (pp. 70-71).

The data presentation in this study centered on a detailed description of the six identified instances across both product and process. Data were based on unobtrusive recordings and centered on projects that had a composition or improvisation focus. Selected instances represented a wide variety of ages, contexts and musical styles. Interactions involved either peers only or teacher with peers.

Findings indicated that shared understanding ". . . is reflected in the musical elements of students' products, as students share, extend, vary, and answer one another's or the teacher's musical ideas" (p. 84). Musical ideas seemed key, with verbal interactions based on the music. Group work seemed to outweigh the importance on any one individual. Individual ideas of group members seem well respected. Work within groups seemed to nurture independent musical thinking.

It is essential that teachers understand and recognize the importance of shared understanding in the musical thought processes of their students. Shared understanding is

the primary basis for musical problem solving and for the development of musical

understanding. (p. 87)

Barrett. Barrett (2003) focused on the process of composition with students as a meaning-

making process. She identifies social constructivism, situated learning , and dialogic inquiry as

building blocks of this learning. To bolster her case, she focused on two ten year-olds, Jenna and

Daniel, in what Barrett called a musical "discourse" about their compositions and a composition

by an adult composer (Koehne's ballet suite for the Oscar Wilde story, *The Selfish Giant)*. Barrett

interviewed the children about their music and their reactions as listeners to the Koehne score.

The article included a text from the interview and examples of music composition from the

children.

> Through these tool kits of techniques and procedures for understanding and managing
>
> their musical worlds, Jenna and Daniel are engaged in an external collaboration with
>
> themselves and an external collaboration with their material and social worlds. I suggest
>
> that both Jenna's and Daniel's compositions are responses to the social and cultural
>
> contexts in which they work and through which they generate meaning. (p. 23)

Ruthmann. In a recent study by Ruthmann (2008) that also explored compositional thinking

and issues of feedback, detailed interactions between an elementary school student, peers, and a

music teacher was reported. Using a case study approach and narrative analysis, Ruthmann

studied an elementary music technology class of 16, 10-11 year-old students in an ethnically

diverse, suburban city in the mid-western United States. The researcher attended the class each

day for a ten-week period, recording field notes, personal reflections, and video recordings of the teacher. The teacher was interviewed after the classes as well. Video recordings were also used to record selected students for more in-depth analysis. Assignments and work products of the students were collected as they completed tasks from computer-based composition. Focus group discussions with children were also used. For the purposes of this study, Ruthmann reported detailed interactions between the teacher and one student who was working on a movie soundtrack. A detailed transcript of the interactions with the teacher are portrayed as were follow-up interviews with the teacher and with the student. Ruthmann interpreted the nature of the feedback, commenting on his interpretation of the authority figure of the teacher and the effect that seemed to have musically on the student. At issue here is the question of whose "agency" matters as the student constructs her understanding of the whole experience. What the reader is given is an excellent insight into the dynamics between the teacher and the student and the researchers take on this as instructional strategy.

Blair. Using musical maps and narrative inquiry techniques, Blair (2007) reported her work with firth-grade music students as they interacted with each other while listening to music. The creation of the musical maps allowed Blair to examine the construction of music learning. The author highlights the process of moving from experience with music and peers in a social setting, to conversations about the music materials, to what was believed to be a more enhanced listening. Although it is not clear what the actual evidence is for the " . . . transformation of self through meaning making. . ." (p. 13), the process described and the narrative inquiry model provided a platform for further research of this sort for discovering meaning construction.

Wetzel. To end this section, we include the work of Wetzel (2007) as an example of curriculum development based on constructivist principles. His study focused on the construction and field-testing of a new jazz method for middle school students. Citing the highly structured and sequentially-based jazz methods already in use, Wetzel believed in the need for a method that was based on a more authentic approach that used discovery and aural modeling. He wrote:

> In keeping with constructivist news, the new curriculum would help students to construct their own knowledge, presenting concepts, holistically or as wholes (as when listening to a recording of a musician improvising a solo) while the student breaks them into smaller ideas (such as specific notes, articulation, fast or slow notes, etc.) according to his/her current and former experiences. (p. 14)

He conceived of a method that could be non-linear and that could be used by educators with limited jazz experience.

After reviewing the theoretical literature to support notions of modeling, discovery approaches, and non-linear instruction, and after accounting for the weaknesses in current jazz curricula materials for middle school, Wetzel presented the framework for his new approach. Avoiding the more traditional student book with sequential routines involving scales, chords, and rhythm instruction based on notation, the materials consisted of a CD with many recorded examples, an instructor booklet, and a support website. Three units of instruction are organized and the emphasis was placed on aural modeling with simple blues patterns, traditional folk songs, and jazz standards. There was no reliance on notated materials and much freedom was given to

the teacher to structure learning as seen fit by supplying supportive materials referenced in the handbook and online. Memorization and improvisation are stressed.

The curriculum was field tested in both summative and formative fashion. In the first phase of the evaluation, jazz content experts reviewed the new curriculum concurrently with the material field-tested by educators. This led to a round of revision which included several changes to all the materials. Results of these and further evaluations from interviews, observations, and rating scales were considered in the final version.

Summary and reaction. A wide variety of qualitative research techniques predominate in all studies in work with elementary and middle school students. Some studies are designed to document teaching strategies (Linn, Wetzel) and others are concerned with the nature of interactions between teachers and students in the construction of knowledge (Wiggins, Whiteman, Ruthmann, and Loren). In these studies, it is not always clear what knowledge is being created or how effective the learning is in understanding music. One study evaluated the effectiveness of invented notation in the construction of musical understanding (Carroll), a topic of some interest to music educators and cognition research in getting a better understanding of what the mind understands about music structure (Bamberger, 1991). Loren's work was a good example of involving students in their own learning and a teacher documenting their attempts to create a constructivist environment. The studies by Barrett and Blair seemed to be guided directly by issues of social and cultural influences and somewhat less by musical issues.

High School Years

Much of the work in this category deals with music performance and improvisation. Research centered on jazz improvisation and informal music learning is important here.

Della Pietra. Della Pietra (1997) completed an experimental study on the effectiveness of a constructivist instructional model of improvisation with high school students. The purpose was to ". . . determine the effectiveness of a three-phase constructivist instructional model for improvisation (that assumes no prerequisite musical knowledge) using non-pitched percussion on the perception and performance of musical rhythm. . . " (p. 12). Della Pietra reasoned that an emphasis on building knowledge constructively was congruent with an instructional model that might affect musicianship—in this case perception and performance of rhythm.

A non-equivalent control group design with pre- and post-testing was used. Subjects were high school students from two different urban locations. Participants were volunteers for the experimental group ($n = 17$) and a piano class as the comparative control group ($n = 13$). The dependent measures were two rhythm subtests form the *Music Aptitude Profile* by Gordon and an investigator-constructed Rhythm Performance Measure (RPM) which used a computer and MIDI percussion controller. The RPM was designed to measure the ability for performance and perception of musical rhythm and used objective data and subjective ratings by judges to evaluate results. Qualitative data on students' reactions and interactions during the improvisation instruction was collected in the form of researcher logs and video tapes.

The model that guided the experimental treatment was as a three-phase approach that was designed to allow students: ". . . with varying degrees of musical experience and ability to work together in a collaborative manner. Participants were free to adopt musical roles according to their abilities" (p. 54). An active-problem solving environment was used for students to explore solutions to problems cooperatively. Open-ended instruction was encouraged so that students needed to create and test rhythms on their own within the context of group improvisation. Guidance was offered in terms of scaffolding which provided "just enough" teacher assistance. The actual lessons were reproduced in the study as an appendix. Instruction occurred over fifteen consecutive meetings and a system was designed to distribute instruction evenly to students. Students in the control group attended piano class daily for the same time period and were taught piano skills in a group setting by a teacher who was not the researcher. Content of instruction centered on music reading and learning piano literature.

Quantitative results showed a significant advantage for the experimental treatment group on the ability to perceive meter. Perception of tempo and the reproduction of musical rhythm were found to be comparable for both groups. Analysis of the qualitative data suggested that students did develop strategies for improvising rhythmic textures collaboratively. Della Pietra concluded that the results seemed promising and that studies such as this one should be done with greater instructional time and for greater numbers of subjects (p. 122).

Allsup. Growing interest in informal music making can be seen in contemporary music education discussion. The work of Green (2002) was cited earlier in this regard. The work of two additional researchers will be noted here since they have used constructivist theory as a large part

of their conceptual base. Allsup (2003) completed an ethnography to study informal music

making with instrumentalists. He drew his inspiration in part from Resnick's notions (1987) of

formal education versus informal. Key points included: (1) individual cognition in school versus

shared cognition, (2) symbol manipulation in school versus contextualized reasoning outside

school, and (3) generalized learning in school versus situation-specific forms of competencies

outside. (Resnick, 1987, pp. 13-15) Allsup was interested in how the composing process might

evolve and help define collaborative or mutual learning communities and relate to the notion of

"democratic" music making. In this context the idea of democratic music making has to do with

the negotiating of power through shared decision making. Tracing the notion of democratic

education to the progressive movement in general and constructivist thinking in particular, he

wrote:

> The notion of democratic education is a complex one, more nuanced than, for example,
>
> letting members of a choir select the color of the group's robes or giving the pop band an
>
> opportunity to vote on music. Democracy requires collaboration, and it must involve
>
> more than just adults—it practice should incorporate the rights and opinions of both
>
> teachers and students. . . . Unfortunately, the authoritarian conception of learning is found
>
> more frequently in schools (and schools of music) than among "outsider" organizations
>
> like teen rock bands or local choral societies. . . (p. 27)

Nine high school band students between the ages of 14-17 worked with the researcher

informally after school for 11 sessions. Students volunteered to be part of the study and the only

requirement was that they have some knowledge of a music instrument. Allsup met with the

students initially and explained that he wanted them to make music of any genre using their band instruments, any percussion equipment, or instruments from home. He explained the collaborative nature of the study and that he was interested in process and not product. The researcher's role was facilitator and not a leader. Students chose to form two groups, one that used band instruments and the other more typical instruments found in a rock band. Field notes and audio recordings were used as data sets. Spontaneous discussions, quasi-formal group interviews, exit interviews and more informal emails and instant messages were also employed. Data was reviewed for themes.

> Two themes emerged: mutual learning and democratic action. The following was reported:
>
>> A typical scenario might include several instrumentalists quietly improvising. The players will seem lost in thought, impervious to the surrounding group. I hear jumbled sounds. No unifying theme, no single melody is being explored—no musical objective has been stated. Then, should someone's tune take hold, or a progression suddenly speak, a head will lift from a finger board, eye contact will be made, and disconnected sound will start to meld. The information becomes communal property, and talking may or may not be necessary. (p. 30)

The study revealed patterns of leadership and power developing with the groups. The study included many revealing dialogs with the students dealing with shared meaning and respect for fellow peers. Students were not used to the teacher as an observer and expressed confusion at first about the role of the teacher/researcher and the freedom that the pedagogy seemed to afford. Allsup concluded:

When students are given space to explore freely, to work democratically, they will create (from one of *their* musical worlds) a context about which they are familiar, conversant, or curious. We might refer to context as a workable space, a landscape for exploring the curiosities of a given genre. Context, thus, may take the form of a popular tradition like progressive rock, a contemporary brass ensemble, or the reimagining of 1930s swing music. The materials that students choose to explore will represent a world that is theirs, a world they understand, a world that defines who they are. (p. 35)

Jaffurs. Jaffurs (2006) was also interested in studying informal music making and completed a qualitative study of a garage band that rehearsed and performed in three separate locations: a basement rehearsal setting, a summer rock music camp, and at a middle school music performance. She used many of the same conceptual bases for her study that were used by Allsup, including the literature on informal education and constructivist philosophy. Her pilot study (Jaffurs, 2004) was useful in designing aspects of the main work, including more carefully constructed questions to study. Jaffurs used the predicted types of data sets for both pilot and main study work: video tapes, field notes, research artifacts, and interview data. In her study of these three musicians, she identified themes of power, struggle, and communication. Supporting themes centered on issues of musicality and trust.

Of special interest in the Jaffurs data were questions connected to Dewey's concept of "continuity." This idea relates to the way people make connections between experiences and was especially useful for Jaffurs in her study of the relationship between formal and informal music settings. The three young musicians that were the focus of her study were junior high school

musicians that she had in school. This afforded her an opportunity to study the same students in different settings to help understand how meaning was constructed. This formed a large part of the framing of her research questions (p. 29). She discovered that the three students thought of the two settings (informal and formal) as separate, but related. Results of their interviews suggested that they saw the formal settings as helpful to their informal music making. (p. 177) In both the pilot work and the main study, Jaffurs noted that she, herself, changed as a teacher. This served as evidence that constructivist learning occurs on many levels.

Berg. The last study in this section addresses the social interactions that can occur in a different kind of setting. Berg (2003) sought to learn about the social construction of musical experience in high school chamber ensembles. Composing original music in a free-form setting was not the central activity in this work, but rather the rehearsal dynamics of chamber musicians as they work together to prepare for a concert without the assistance of an older coach. Two separate chamber groups were selected for the study.

Research questions were: (1) do identifiable patterns of musical thought and action exist within the ensembles and (2) how do these patterns reveal ways that student interactions, tools, and social structures assist or constrain movement through the "zone of proximal development" toward increased musical awareness (pp. 5-6). Also of interest were the notions of intersubjectivity, tool use, and social identity. Intersubjectivity here refers the pattern of exchange between two entities (people) who begin a task with different understandings and move to more of a shared understanding. The conceptual frame for Berg's work is clearly Vygotskian

theory and his thoughts on social construction of meaning. Berg chose to study how this unfolds

in an intensive chamber music rehearsal setting with high school musicians.

The two ensembles were chosen by investigating available chamber ensemble programs in

northeast Illinois that seemed highly regarded and selecting two ensembles within each school

that regularly met. A trio and a quartet were chosen. Each setting is described in depth. Data

were gathered over a five-month period for a total of 33 observations (13 rehearsals, 16 coaching

sessions, and 4 performances). Data also included eleven formal interviews, informal interviews,

and the collection of biographical information. Audio and video tapes were used for subsequent

analysis (p. 91). Data, including field notes, were coded and studied for emergent themes that

helped answer research questions. The researcher's role was an observer.

In terms of the first research question, Berg found four patterns of musical thought and

action: (1) musical topics covered in rehearsals, (2) amount and nature of the music rehearsed

during each rehearsal, (3) types and frequency of verbal and non-verbal activity used by

participants, and (4) sequence of student activity during rehearsals. These patterns are described

at length in the study.   For the second research question,

Berg wrote:

> Members of both ensembles challenged each other to work at a higher or proximal level
>
> of development by requiring peers to clarify and elaborate on a point of view through the
>
> use of more precise language, and to justify an evaluation or problem solution. . .
>
> through the various roles assumed, members from both ensembles used two cognitive
>
> apprenticeship strategies. . . including: *coaching* through giving peers feedback and
>
> *providing a scaffold* through supported practice. The Steering High School ensemble

also used the cognitive apprenticeship strategy of *fading* the amount of support by giving

increasingly less assistance over the course of a rehearsal. [italics original] (p. 235)

Berg reported that evidence for intersubjectivity was found in both ensembles as students

posed questions, clarified positions, and worked on relationships between bowing and dynamics.

Various tools (both tangible and psychological) were used and these are described in depth in the

study. Although this was not always the case, roles were also clearly established by the musicians

as they worked with one another.

Summary and reaction. The work by Della Pietra demonstrates that quantitative models of

research are viable in studying this topic. His results showed evidence that the constructivist

approaches such as the one used here may be effective, but clearly more work is necessary.

Allsup and Jeffurs work with informal music making is noteworthy and consistent with current

trends to encourage independent music making in high school settings. Data which they report

help us to see the possibilities of teachers moving away from the center stage in favor of a more

shared learning structure. This was also true for the study by Berg. Berg's work with high school

instrumentalists in a chamber music setting has significant implications for our rethinking the

structure of high school performance experiences to include smaller groups that can be allowed to

function more independently with our guidance. We also gain some insight into how issues of

interaction between the students themselves may unfold in such settings.

College Students and Adults

We now turn to work done with college students and adults. Much of the work reported here is on teacher preparation.

Schmidt. Student teaching was the focus of this study by Schmidt (1994) and included four student teachers and their perceptions of their teaching experiences. Also of interest were the influences on these perceptions. All four came from the same music education program but their stories were different. At core for Schmidt in this study was her belief that "knowing" is constructed not from positivistic perspectives but from a constructivist viewpoint.

> Constructivist researchers study experience as holistic, investigating its component parts and their interrelationships in context. They explore not only a problem, but the meaning that problem holds for those involved in it, paying particular attention to the individuality, motives, feelings, and contexts of both the participants and the researchers. (p. 7)

Schmidt used several frames of reference to help with the organization of her study. These included previous research on teacher's perceptions of teaching, feelings of self as a teacher, and research of pre-service teachers' experiential learning as students in schools and children in families, and many more. She employed a qualitative emergent design in her study of the four teachers by conducting many semi-structured interviews with the student teachers, observing as much of their work as possible, attending seminars that they attended, and by observing interactions with cooperating teachers and university supervisors. The researcher took the stance of a participant observer. She also viewed her informants and those around them as co-researchers. The study involved 12 different school settings and 15 different cooperating teachers

and began a semester prior to the student teaching experience and extended after that experience with follow-up interviews.

The study provided a set of four cases or "stories" as the central content of the data. Data were drawn from journals and interviews and coded for analysis. A chapter of the study provided an analysis of the specific music education programs from which the four teachers gained their formal education and this provided a context for the cases as they emerged. Each case explained details of the teacher's background as a musician and student, circumstances surrounding placement, and an account of the experience. Cross-case analyses are presented and the results are summarized. The results are complex and nuanced (with differences described as well as similarities) but the following is a summary of results which are portrayed as constructively-driven:

1. Learning to teach seemed to be a combination of cognitive growth and teaching experience; students seemed influenced by pre-designed views of teaching but changed as the experience itself developed. University courses in music education did not seem to be a major influence.

2. Learning was cumulative and idiosyncratic with roots in previous experience

3. Personal meanings of themselves dominated

4. Understanding of their relations with mentors affected what they learned from those mentors.

> . . . no matter how others assessed their experience, the content of the student teachers' learning depended on how they themselves framed and gave meaning to those experiences. Cooperating teachers, faculty, and supervisors could only assist in that

process. They could not directly teach a given definition of good teaching to the student . . . (p. 425)

Campbell. These findings from Schmidt were supported by Campbell (1999) some five years later in his work with 43 college students enrolled in a teaching practicum. Campbell stated his purpose clearly:

> . . . I sought to explore and learn from novice music teachers—those who enter the elementary school general music classroom for their first formal teaching experience—how it is they learn to teach general music. Specifically, I attempted to generate a description of the strategies and modes of interactions they employed to develop practical knowledge in becoming general music teachers. (p. 13)

Campbell used a constructivist theoretical framework and reviewed data with three different qualitative lenses: monological, subjectivity, and dialogical. These involved several forms of interview, video tape analyses, student journals, field records, and seminar conversations. The study contains detailed descriptions of data analyses with many examples of how the researcher conceptualized the information. Through these descriptions, the way meaning is developed in the novice teacher becomes clear.

Lee. A very different study of teacher education, one that is challenging to read and to understand, yet likely appealing to the student of constructivist scholarship, was completed by

Lee (2004). The work is a "storied" dissertation that explores the identity of students as they become teachers of music having come from an identity of a musician:

> I wish to understand the shifts or extensions of a musician's identity as they become music educators. Musicians who enter teacher education programs may have spent years performing as vocalists or instrumentalists. Expectations about teaching and learning music is based on their own musical experiences. Most musicians gain most of their music training from outside the school music context. Thus, the dilemma of music educators often begins with teaching but is placed within the larger social, political, educational, and cultural context of politics. (p. 15-16)

Lee recounts her personal story of becoming who she is while at the same time supplying eight other musician/teacher stories in the form of creative non-fiction. Weaved into her study are writings from arts-based research, research on identity formation and from feminist-based literature. She includes her own poetry and art along the way. Reflections on her own graduate education, courses that she has taken, and deep and meaningful discussion with her doctoral advisor round out this study. One is reminded of Eisner (1997) and his interest in research in the arts being itself designed as something of an artistic object. The following is Lee's own abstracted description of the results of her study:

> My research found several results. First, some musicians could overcome their conflict if they collaborated in the story writing process, and was mentored by a school advisor that was also a professional musician. Second, story and autobiographical writing were found to be rich research methodology tools. While story writing helped some musicians,

autobiography helped me resolve earlier conflicts which drew me back into music. Story authorship has helped me to understand my questions and musings about musicians, music educators, musicians as educators, and musicians becoming educators. I gained a fresh voice and embraced the notion that I could explore issues from multiple viewpoints and writing styles. (p. iii)

Grant. Writing from a similar perspective, in an autobiographical voice, Grant (2003) studied her own journey as a jazz performer. Over a six month period, Grant documented her experiences working with the Toronto jazz community. Grant constructed her understandings based on this experience and past experiences and beliefs. The themes that came forth in her journal writings are represented through paintings, poetry, and jazz compositions recorded on CD. She used constructivism as a basis for these presentations and notes the following:

> I noticed many similarities between constructivism and what I understood to be the experience of making jazz music. Specifically constructivism places the responsibility for learning with the learner who synthesizes new information with previous beliefs to construct new understandings. (p. 6)

An example of the kind of self-analysis that she offered as part of her journey to capture meaning is represented here:

> My desperate struggle, as a musician and as a woman, was to find ways to connect with others. I thought that the answer lay in technical mastery. If I only knew what it is I had to say, and the skill to say it, then I would somehow magically be able to connect with

others. As I return to the practice room, I now suspect, however, that the cure for my fear

of being alone can be found in the act of lovingly creating something; and in the

realization of a musical creation borne out of the true self. (p. 119)

Grant concluded that learning more about collaboration and trust in oneself were keys to better

work in jazz and in teaching.

Dvrorin-Spross. Dvrorin-Spross (2005) worked with undergraduate humanities students as

they engaged in a class designed to revisit childhood music experiences (primarily songs sung)

for the construction of praxis for children. The author, an experienced ethnographer, served as

the designer and instructor of the class. The purpose was to describe, analyze, and interpret the

processes and products of the course. Of special interest was to determine: (1) the songs known

by the students, (2) the capability of students to collect and document their community music, (3)

what categories were used in which to place the music, (4) what strategies the students would use

to present their music, and (4) how reluctant singers might approach the presentations. Concepts

behind constructivism drove the theoretical basis for the study as well as the literature on musical

identity.

The course, named *Tune, Tot, and Kin*, ran for 10 weeks and 93 students completed the

course. Students worked both individually and in groups within a noncompetitive structure to

remember, collect, and organize music experienced in previous years. A wide variety of musics

from many cultures were collected and even performed.   Students used many ethnomusicological

methods to complete assignments. Thirty-seven known songs were recalled from childhood.

Categories centered on holiday, patriotic, school (learning), and lullaby (bedtime).

> Overall, *Tune, Tot, and Kin* students displayed heightened sensitivity to the issues
>
> involved in presenting musical expressions of diverse cultures. Those students who were
>
> culture-bearers came forward voluntarily to share their knowledge. For students like
>
> Kelsey, the *re* "family" song presentation ("Cum Num Cum Niu") was an opportunity to
>
> reconnect with her Vietnamese heritage. There was tacit agreement that our class would
>
> welcome such sharing but that no one was under any obligation to "represent" their
>
> cultures. (p. 184)

Chen. Case studies of constructivist teachers in music are not common. Chen (2000)

competed such a study by providing a deep description of an elementary music teacher from the

public school system in Presque Isle, Maine. The focus of this study was a description of the

teacher's practice, ". . . the challenges that she encountered in the process of reconstructing her

teaching practice, and the implications this has for music teachers who have heard about

Constructivism and wish to consider the implications of the theory for their practice in the future"

(p. 8). The work was an ethnographic study that involved two months of observation. Data

included extensive observations of teaching with the researcher recording all teaching on audio

tape and some video tape, extensive interviews with the teacher, interviews with other teachers

and the principal of the school, and other artifacts. Data were analyzed qualitatively and themes

were identified according to the research questions. Dr. Miller was included in the reading of

transcripts and the study was read by her for verification.

The study included detailed descriptions of lessons, including sample transcriptions. Many teaching strategies were highlighted, including: questioning techniques, wait time, scaffolding, encouragement of musical thinking, collaborative learning, careful listening to children's musical reasoning and offering comments, and the sharing of knowledge and authority were noted. Sensitivity to student needs was also highlighted.

> Constructivist teaching is different from laissez faire curriculum. Students are empowered to construct the knowledge within a "controlled" learning situation or within a guiding frame. In constructivist teaching, teacher and students alike are constructors. That is, the teacher needs to constantly evaluate students' learning, be sensitive to students' needs and provide appropriate facilitation to help them move beyond their current cognitive state. It is worth underscoring that no technique will in and of itself necessarily lead to successful constructivist teaching and learning without the teacher and students learning together. (p. 136)

In her conclusions, Chen noted that among the many themes that emerged was the notion that constructivism is a ". . . way of thinking and behaving rather than the implementation of some new teaching activities" (p. 167). She noted too that much of what the teacher did was always prompted by a desire to teach musical concepts (p. 176).

Summary and reaction. The work by Schmidt and Campbell remind us that, if we are in charge of teacher preparation programs, that constructivist techniques can be used with adults as models for how to work with children. Building such experiences into how we educate teachers

is one way to help establish such techniques in schools. Of importance too was the finding that student teachers are driven profoundly by pre-conceived ideas of teaching. Campbell provided an interesting glimpse into how meaning was constructed for the teachers he studied. The "becoming" of a teacher is well documented by Lee and Grant in fascinating autobiographical voices. The ability to generalize this work to other situations is limited, but the documented journey was a glimpse into personal meaning making and consistent with constructivist thinking. The work by Dvrorin-Spross and Chen was reminiscent of Hanley's (2003) account of course creation and served as still more evidence of teaching strategies in music that celebrate constructivist approaches.

Technology and Its Role in Constructivism in Music Teaching[4]

We end this final section on the constructivist research literature in music with a brief review of studies in music teaching and learning that have drawn greatly from advances in music technology. From the pioneering work of Papert (1980) and from the writings in general education on the role of technology in education and in distance education (Roschelle, Pea, Hoadley, Gordin, & Means, 2000) (Jonassen, Davidson, Collins, & Campbell, 1995), we have come to realize the importance of computers and other digital technology as tools for learning in a constructivist environment. Outside of the traditional field of music education, the work at the MIT Media Lab continues to develop and includes projects like the MICK Constructionist Toolkit for Music Education (http: gig.media.mit.edu/papers/chi02_mick.pdf) and the Toy Symphony project of Tod Machover and colleagues (http://opera.media.mit.edu/ToySymphony/project.html).

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[4] For one review of research on the use and effectiveness of music technology in music teaching and learning, see Webster (2007). Many studies reported there have implications for technology's role in constructivist learning.

Bauer. Work done directly in music education and that uses a constructivist conceptual frame include studies by Bauer, Keast, and Brewster. Bauer (2001) described a joint project between two geographically removed universities that centered on a graduate course in music education history and philosophy. Nineteen students participated in the collaborative course using Internet communication. A discussion forum was used to collaborate and they used the web to find sites that related to the topics discussed. Students helped construct a site of their own. The study featured examples of interchanges between students. The students evaluated the project by completing a questionnaire indicating overall satisfaction with the project, although theyseemed skeptical of an entirely web-based course (p. 32).

Keast. Keast (2004) studied the effectiveness of constructivist principles in an online activity for a graduate music education course. He was interested in how effective the students were at accomplishing the objectives of the assignment and how they used the Internet resources to construct their understanding. His class was given an assignment culminating in a class presentation. The assignment, based on research on American tune books, was assessed by ratings of the final project presentations and was examined for how students used the Internet for finding information. The researcher aided students by providing scaffolding tools.   Results of the ratings of the presentations showed that they were successful beyond expectation. Logs of Internet use showed how the students used online resources.

Brewster. Finally, Brewster (2005) constructed and evaluated a tool for featuring web-based investigation of a topic for college teaching, in this case a unit on the sociology of music for undergraduates. The tool, Constructivist-Inspired Summary Portal (CISP), was designed to help students interact with web-based content using different techniques. Testing of the interface's effectiveness with a small experimental and control group study showed no significant difference in final test scores but students did express the belief that the CISP technology helped them in studying for the final exam in the course.

Summary and Reaction. The work in music education in studying the application of technology with constructivist approaches is strikingly meager for a field that is so dominated by technology usage. We lack sophisticated studies that examine music learning primarily driven by music technology.

Conclusions

A review of the evidence-based work in music education on constructivist techniques shows only a start toward the promise that is characterized in the general literature and in the conceptual and practical literatures in our field. Of the fifteen questions that are posed in the summary of the first section of this chapter, we seem to have the beginnings of credible data for: (1) now music meaning is constructed, (2) what strategies for teaching seem plausible, and (3) how we move as teachers off the center stage to encourage student involvement. We need evidence about language as a mediator for learning, constructed meaning and its variance with established canonic principles, and the levels of active engagement that really teach musical understanding. We need

more knowledge about individual assessment in the face of social construction. We certainly need evidence about how best to deal with parents and administrators in terms of constructivist techniques that feature process and product. Perhaps the most critical evidence we need is the extent to which constructivist techniques lead to real and lasting music learning—a case that is yet to emerge from the literature.

In music and music education, constructivism has made little headway in changing the fundamental way teachers are prepared or how in-service professionals do their jobs. For proponents of this theory of learning amongst music educators, however, the music literature noted here gives one real hope. It should be remembered, too, that certain research done in music teaching and learning might be considered inspired by topics associated with classic constructivism, but authors simply do not cite it as part of the conceptual base and hence did not get reported here. For example, certain approaches to music listening, improvisation, and music performance might involve constructed knowledge, learning in action, portfolio assessment, situated cognition, collaborative learning, and other constructivist-related strategies. We have already noted that much of the work in music composition and music technology might be considered as connected to a constructivist approach. Nevertheless, as Shivley suggests (1995), we lack an articulated philosophy of constructivism that might unify professional work.

Strengths and Weaknesses

Certainly some of the possible benefits of this approach are demonstrated by the literature in music reviewed here, although much further research is needed for a few of the common claims below:

- Children seem to enjoy learning by being actively involved

- Music learning is seen in a more demonstrated way

- Teachers seem successful with strategies that encourage thoughtful student involvement

- Constructivism gives students a sense of ownership of ideas and a sense of participation in project design and assessment—in this way more democratic

- Students see school work as more authentic and more rooted in real work expectations

- Students are motivated to create because of what they sense is a safer and less threatening environment

- Constructivism promotes social and communication skills as students learn to negotiate with others

Questions exist on the critical side:

- Is this approach elitist? (Delpit, 1996) Some argue that this theory and other "progressive" approaches work best in more privileged backgrounds where the likelihood of better materials, teachers, and home environments abound

- Children may emerge from constructivist units of study missing key knowledge if teachers are not thoughtful about individual assessment

- Teacher educators may find constructivism difficult to teach a novice teacher because of the lack of good models in the young teacher's experience

- The theory is not well understood by parents, administrators, and other stakeholders who expect and perhaps demand a more direct approach

- There appears to be little "hard evidence" that children learn more in the long run; there are major difficulties in the measurement of constructivist teaching

These last two bulleted points are particularly challenging. The political realities of including constructivist approaches are most difficult to overcome for music teachers in our current educational culture.   No one has studied the realities of what teachers would need to face in their school districts if constructivism were adopted in a widespread way. Wiggins (2007) gives us some hope and direction perhaps in teacher education on the college level, but even there the task seems daunting. Cook and her colleagues (Cook, Smagorinsky, Fry, Konopak, and Moore, 2000) share a case study of a young professional, steeped in a teaching education program that highlighted constructivism, who entered her first job only to be forced to teach in a completely different way due to the circumstances of the district and her lack of real grounding in the theory. Constructivism is hard work for teachers to do well.

Cause for Celebration: Clues for Continued Research and Practice

Despite these issues, there are many shinning examples in the work that is reported here that gives us all cause for celebration. From research and conceptual writing, we have many examples of solid work that show that music educators have faced the conceptual, pedagogical, and cultural

dilemmas outlined. I list the following highlights that, for me, deserve close attention in practice and for further research:

- Shively's discourse on the "working out" of the conceptual notions of constructivism for beginning instrumental music

- Wiggins's many contributions, but particularly the implications from her 2001 text for systematic change for practice

- Abrahams's case for critical theory and its contribution to research and practice

- Scott's plea for varied and long-term applications of constructivism and for possible abuses like pseudo-constructivism

- The role of reflective practice (many authors) for teacher's construction of meaning for teaching

- Hanley's brilliant two-part course description that focused on constructing knowledge of music and confronting important pedagogy issues

- The role of informal music learning (many authors) as a partner to formal teaching

- Zarro's and Gang's attention to constructivism in the applied studio

- Pearce's courage to do a long-term constructivist study of a topic (Paul Whiteman in Denver) as a co-discovery, thus modeling the very idea of constructed learning

- Broomhead's courage to study his own practice, find fault with his teaching, and fix it with the idea of encouraging musical independence in his choirs

- Wetzel's innovative jazz teaching pedagogy that broke dramatically with traditional practice and the foresight to test out the approach

- Berg's study of high school chamber musicians independently making musical decisions as a way to understand how we can improve teaching practice

- Schmidt's side by side case studies of student teachers from the same undergraduate program in order to understand constructed meaning

- Lee's "storied" dissertation as an innovative way to portray personally constructed meaning

- Chen's case study over a prolonged time of a constructivist music teacher

Each of these contributions suggest to me many varied and complex ways to further study and help "construct" our understanding as a profession. Each of these highlighted writings hold promise for extension and replication in order to better understand music learning.

Writers in our field should be clearer about the stance taken on "discovered" learning and its relation to much of the standard canonical understanding of music. Teachers need guidance to understand the role they play in negotiating this relationship. If this is of little concern to the researcher/teacher, then this needs to be made clear.

Finally, here is a short list of recommendations for further research that have not been represented here:

- Study of constructivist principles in large-group ensembles

- Quantitative studies such as Della Pietra's which address comparisons of constructivist approaches to short- and long-term learning

- More focused and extensive technology-based work that could feature product (learning) and process (technology use patterns)

- Study of blended teaching that involved a combination of well designed direct instruction and constructivist approaches (Cuban, 2008)

- Curriculum studies on teacher preparation programs

- Studies on teaching strategies that place at odds music realities with "discovered" features that may be incorrect

- Studies on the political realities (of how to introduce constructivist approaches in a very traditional product-centric environment

- Assessment techniques that demonstrate the very qualities that constructivism espouses

I end this chapter as it began, with the words of Perkins (1999). Here he writes about the many faces of constructivism and makes a case for a more pragmatic approach to the use of this powerful theory of learning that challenges, thrills, and frustrates us all:

Often, the case made for constructivism seems resoundingly ideological. If learners do not rediscover Greek philosophy or Newton's laws for themselves, they will never truly understand them. To arrive at meaningful knowledge, they must learn through deep inquiry. As the unexamined life is not worth living, so the unexamined fact is not worth believing. And so on.

But the constructivist ideas assembled here are anything but ideological. They make up what we might call pragmatic constructivism. Their message asks us to view constructivism as a toolbox for problems of learning. Troublesome knowledge of various kinds invites constructivist responses to fit the difficulties—not one standard

constructivist fix. If a particular approach does not solve the problem, try another—more

structured, less structured, more discovery oriented, less discovery oriented, whatever

works. And when knowledge is not particularly troublesome for the learners in question,

well, forget about active, social, creative learners. Teaching by telling may serve just

fine. (p.11)

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