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RESISTING CURRICULUM INTEGRATION:

Do Good Fences Make Good Neighbors?

by

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Abstract: Curriculum integration has a long history. In this paper I catalog several arguments for resistance against integration and present the historical roots of support for those arguments offered by critics of curriculum integration. First, I review some linguistic and usage limitations of the term. Second, I examine several practical and institutional difficulties related to implementing integrated curriculum. Third, I explore some interconnected psychological and sociological dimensions of resistance to curriculum integration. Finally, I consider several epistemological dimensions of resistance to integration, some of which underlie the sociological and psychological aspects. While recognizing that some resistance to integration will never be answered, I argue that in order to answer some of the questions raised by this analysis we need more empirical research into integrated curriculum and integrative teaching.

Curriculum integration is broadly understood as a philosophy of education and set of practices through which content is drawn from several subject areas or disciplines to focus on a particular topic or theme with the aim of seeing the connections between the subject area content and the wider context (McBrien & Brandt, 1997, p. 55). Curriculum integration has enjoyed a long history. The 1895 annual meeting of the National Herbart Society (in America now the National Society for the Study of Education or NSSE) focused on conceptions of curriculum meant to help students gain a coherent understanding of the world (Wraga, 1996). That meeting's focus served as only one part of an extended debate among educators of the time, a debate

conducted on more than one continent. For example, three years later, in Paris, Alexis Bertrand submitted his thesis, *L'Enseignement Integral* (Bertrand, 1898), and a year later, Guy Maxwell assigned his Columbia University master's thesis the title: *The Doctrine of Correlation of Studies in the United States.* Maxwell called for curriculum that explicitly recognized the relationships among the academic disciplines and for instruction that would help students see those connections (Ciccorico, 1970). Despite their relatively early dates, Maxwell and Bertrand were not the first to call for curriculum integration. Credit for this should likely go to Herbart himself, acknowledged as the founder of the field of pedagogy, because as early as 1835 he exhorted educators to teach so that students would see the correlations between subjects (Harvill, 1954; Herbart, 1835/1901). In the years since Herbart's *Outlines of Educational Doctrine*, interest in integration of curriculum has waxed and waned several times as has been well documented by others (such as Hayes Jacobs, 1997; Henry, 1958; Hopkins, 1937; Ingram, 1979; Klein, 2002; Wraga, 1996).

A careful observer of the conversation about curriculum integration will hear its advocates far more frequently than its critics, and even among its advocates there are different models and approaches. Moreover, curriculum integration has its discontents. Those who object to curriculum integration have consistently—and sometimes loudly—voiced concerns that warrant schematizing and some genealogical exploration of their respective positions. Here I catalog several arguments for resistance and present the support for those arguments offered by critics of curriculum integration. My conversation partners include both critics of curriculum integration and those among its advocates who have addressed the critics' arguments.

In what follows, I explore four kinds of resistance to curriculum integration. First, I review some linguistic and usage limitations of the term which most advocates concede, and which some critics find sufficient to reject the project altogether. Second, I examine several practical and institutional difficulties related to implementing integrated curriculum. Resistance to curriculum integration also has psychological and sociological aspects, which I explore together here because they are closely interconnected. Finally, I will consider several epistemological dimensions of resistance to integration, some of which underlie the sociological and psychological aspects. As I make clear in the first section of the paper, loose usage bedevils *curriculum integration*. When users of integrative language omit to stipulate, specify or otherwise restrict their meanings, they generate confusion about and possibly engender resistance to integration. To avoid making that error here, I will stipulate this definition:

Integration involves curriculum or instruction that combines, draws upon or encourages students to see connections between the contents of two or more academic disciplines. I offer this brief definition, recognizing its many shortcomings, because I have set myself the task of cataloging resistance to curriculum integration and exploring some of the roots of that resistance, not of clarifying the key term. To expedite that cataloging task, I will rely on the extensive attention to clarification given by several writers, and the inclusion of a schema of typical meanings in my first major section. Awareness of this schema should help participants in the curriculum integration discussion achieve clarity about the concept of integration and thereby facilitate clearer discussion of its merits. I focus herein on K-12 education, although much of what I survey relates to higher education as well.

I. Linguistic and Conceptual Aspects of Resistance to Integration

Intuitively, one may want to respond to the suggestion that resistance to integration has a linguistic dimension by exclaiming, "Of course! It's language!" While such a response perhaps makes sense, it also glosses over some subterranean dimensions of educators' use of the term *integration*. In this section of the paper I explore seven linguistic dimensions of *integration*: (1) its positive connotations and status as a slogan, (2) its essential contestability as a concept, (3) its status as a concept subject to conception-building, (4) its task and achievement senses, (5) the difficulties of identifying where integration happens (the locus question), (6) the variety of models which proponents of integration have suggested, and (7) the confusion caused by such problematic related terms as *interdisciplinarity*.

Exploring these linguistic nuances makes sense because educators should not adopt an approach to curriculum so radically different from the status quo if they cannot specify precisely the salient features of that approach, a view shared by both critics and advocates (Czerniak, Weber, Sandmann & Ahern, 1999; Erb, 1996; George, 1996; Kysilka, 1998). Various observers have cataloged the uses of the term and have noted its linguistic difficulties (Badley, 1994; Fogarty, 1991b; Pring, 1973; Vars, 1996). Such analyses indicate the slipperiness of the term—that those using integrative language must carefully specify their intentions—but they certainly do not justify abandoning such language altogether. Furthermore, for anyone considering implementing integrated curriculum, such catalogs of models defuse the argument of those who view linguistic difficulties as sufficient reason to reject an integrated approach to education.

1. Positive Connotations and Status as a Slogan

To begin, *integration* serves as a slogan. The popularity of, or interest in, curriculum integration may vary, but the core term *integration* remains a positive term (Badley, 1986; Czerniak et al., 1999). *Integration* achieved slogan status decades ago and has periodically served curricular and educational policy ends which even some advocates consider questionable, and many critics reject outright (Dressel, 1958; Kysilka, 1998). But when a concept achieves the dubious status of slogan, it does not necessarily lose its usefulness. Komisar and McClellan noted a half-century ago that a slogan possesses its own logic, that it operates by rendering cognitive meaning secondary to emotive meaning and the call to action its users embed in it (Komisar & McClellan, 1961). On their account, this order of meanings—emotive first, cognitive second—does not disqualify *integration*. Critics and advocates of integration often part ways on Komisar and McClellan's point. Many critics reject the term on the grounds that it is unclear, and most advocates, by definition, favor its continued use, albeit with additional attention to clarity as to its specific meaning in each instance.

2. Contestability as a Concept

Integration may also qualify as an essentially contested concept. In 1956, W.B. Gallie suggested the category "*essentially-contested concepts"* which included those normative terms such as *integration* that feature centrally in policy and philosophical tugs of war (Gallie, 1956, 1962). In the decades since Gallie, scholars in many fields have employed the category to untangle substantive disagreements rooted partly in how people use and understand specific bits of language (Clarke, 1979; Criley, 2007; Gray, 1978; Swanton, 1995). Those interested in curriculum integration might benefit by employing Gallie's category as well. *Integration* seems to meet the following four (most important) of Gallie's seven conditions for essential contestability: (1) it is positive; (2) it is complex and multidimensional; (3) people describe it in different ways; and (4) it changes form in different circumstances. If *integration* fits Gallie's category, then disagreement as to its meaning does not imply academic obstinacy or that integrated education is not a worthwhile educational aim. Rather it suggests that the concept is fluid, adaptable and open to contingent possibilities; as such it forms part of the open architecture of educational philosophy.

3. A Concept Subject to Conception-Building

For some decades, philosophers, legal scholars, and social scientists have

distinguished between concepts and conceptions (Dworkin, 1988; Ezcurdia, 1998; Lukes, 1974; Macia, 1998; Rawls, 1999). Both Dworkin and Rawls have noted that concepts such as *democracy*, *justice,* and *education* invite conception-building. Language users, while agreeing with each other about what dictionaries report as the denotations of such normative concepts, nevertheless build onto the core concepts their own conceptions—connotations—of what ought to be (Piaget, 1960); they sketch out their own visions of the good life. On this account, a group of educators could agree (with most dictionaries) that integration denotes joining things or making and seeing connections. All educators work from educational ideals, however, and users of the word *integration* inevitably will import elements of their own visions of the good life into the conversation; they will build conceptions. Yet, given the way that normative terms carry connotations along with their denotations, I argue that identifying integration as a concept subject to conception-building does not constitute a sufficient reason to eschew integrated curriculum. In fact, advocates of all views of education base their arguments on conceptions of the good life. Still, proponents of integration who take the distinction between concept and conception seriously have a responsibility to be clear when they begin to attach their own conceptions to the concept of integration. On the other hand, they need not take the concept-conception distinction as a reason to abandon their advocacy.

4. Task and Achievement Senses

Philosophers of education have used Gilbert Ryle's distinction between achievement and task senses of words to help clarify problematic educational concepts such as *teaching* (Gowin, 1961, 1962; Robinson, 1997; Ryle, 1949). Those wanting to untangle *integration* might find helpful Ryle's reminder that *integration* can denote both engagement in a task and completion of that task. Consider this scenario: Members of the curriculum committee have designed a course, for example, environmental ethics, that draws on several academic disciplines, say philosophy, biology, political science, law, economics, and sociology; the instructors have planned suitable instruction; students in the course have achieved an integrated understanding of the subject matter. Few advocates of integration would deny that this hypothetical scenario describes the achievement of integration, although, remembering Gallie's observation that *integration* is an essentially contestable concept, we might expect quibbling over the respective roles of curriculum committee, teacher or teachers, and students. Does *integration* also have a task sense? If the curriculum committee or

teachers intend and plan for integrative outcomes (Ryle distinguished intentional senses along with task and achievement senses), and those instructing teach in ways meant to achieve integrative ends, but students do not realize the connections—they fall short of achievement—then we must conclude that integration has what Ryle called a task sense. In other words, to the degree that failed attempts at integration figure in the integration debate, then Ryle's distinction may help. As was the case with Gallie's category, Ryle offers integration's critics a reason to pause.

5. Identifying Where Integration Happens

The scenario above, with its reference to the curriculum committee, teachers and students, brings us to the fifth language-related difficulty for those who would use *integration*: What is the locus of integration? Where does it happen? Undoubtedly, we could extend this list, but one might argue that integration occurs (to whatever degree it can be said to have location) in one or more of the following loci: the student's understanding (D.T. Campbell, 1969; Dewey, 1902; Fogarty, 1991a; Herbart, 1835/1901; Lamdin, 1982; Megroth & Washburne, 1949; St. Clair & Hough, 1992), the instructional moment (Palmer, 1998), the curriculum (Counelis, 1979), the teacher (Fogarty, 1991b), the whole institutional ethos (Gaebelein, 1954; Holmes, 1987). Even without extended exploration of this question, we may see that graduates of even the best-designed program will not necessarily grasp the connections intended by those who planned that program. With that in view, we conclude that a curriculum intended to produce coherent understanding is not sufficient to ensure integrative outcomes. On the other hand, students may graduate with a coherent understanding from a haphazard curriculum at an institution characterized by poor communication or even open conflict between departments, a well-known institutional condition that one would intuitively expect to vitiate the development of integrated understanding (Ascher & Flaxman, 1993). That, in fact, was my own undergraduate experience; I received a wonderful, coherent education at an institution engaged in unending inter-departmental war. Thus, integrated curriculum is apparently not a necessary condition for integrated understanding. Without my exploring such test cases for each of the possible loci of integration, the argument's endpoint is obvious: Integration involves some combination—likely different in each circumstance—of the possible loci. And the existence of at least the five possible loci listed above, along with the mind-boggling number of possible combinations, gives some critics sufficient reason to argue that integration is simply not clear enough to qualify as an educational goal.

6. A Variety of Models

Some have complained that *integration* remains vague and ambiguous. Such charges usually focus on the many kinds of "integrated" curriculum or approaches to education. Anyone attempting to clarify the confusion attending curriculum integration talk must note and attempt to schematize the many models of integration, and thereby reduce conceptual fuzziness (Alpren, 1967; Badley, 1986; Czerniak et al., 1999; Gozzer, 1982; Lederman & Niess, 1997; Wraga, 1996). Critics of integration regularly point to the number of connected concepts and possible models as evidence that integration is certainly fuzzy and possibly dangerous. Advocates of integration, and even those who assemble electronic database thesauri, have faced the plethora of meanings bravely. And what is that range?

By integration, some mean correlation of topics from different disciplines (Alpren, 1967; Harvill, 1954). Some think that correlation might be too much to ask but do hope to achieve dialogue between representatives of different disciplines. Others call for the merging or fusion of separate disciplines (Alpren, 1967; Lederman & Niess, 1997). With reference to fusion integration, we must note those educators who insist that some school subjects already integrate several disciplines (Hirst, 1974b; Phenix, 1964) or even that knowledge itself is already, by definition, an integration of experience (Pring, 1973).

Incorporation of one subject into another appears quite commonly in the educational literature, as does use of the methods and approaches of one discipline within another (Berlin, 1994; Hayes Jacobs, 1989). In perspectival integration, the entire educational enterprise makes sense within a specific perspective. On this account, a specific worldview gives coherence to the disparate and even conflicting elements as they fit into a larger framework of thought and practice (Guthrie & Noftzger, 1992). Interdisciplinary courses, teams, and investigation offer another model of integration, one often connected to correlation and dialogue (Davis, 1995; Klein, 1990, 2002; Moran, 2002; Tchudi, 1991).

More detailed schemata of the meanings of integration appear elsewhere, but this short catalog makes the multiple-models point quite adequately (Fogarty, 1991b; Hayes Jacobs, 1989; Newell, 1998). Critics and advocates of integration alike have a stake in whether the existence of such variety necessarily demands that educators abandon either the term or the educational ideal it represents. A catalog such as this one points to the constant need for educators to clarify their ideals and to specify what kind of integration they envision when they choose this language.

7. The Confusion Caused by Problematic Related Terms

Finally, in addition to the complex variety of models possibly implied by anyone using integration language, *integration* has many cousined concepts, such as *thematic teaching*, *integrated day*, *multi-disciplinary*, *transdisciplinary* and *interdisciplinary* (Gozzer, 1982; Hadorn et al., 2008; Pohl & Hadorn, 2007). Strangely perhaps, critics of integration have objected to its use on the grounds that it has these cousined terms, an objection that, were it to apply to all language, would leave us all speechless.

In the foregoing, I have surveyed seven language-related characteristics of the concept of integration that may constitute or raise problems for educators. Supporters of integration do not see in these problems a sufficient reason to abandon this educational ideal. But some critics of integration find in these linguistic challenges grounds for abandoning the project. Other critics combine such usage problems with more substantive difficulties and then draw the same conclusion. We turn now to some of those other criticisms.

II. Institutional and Practical Concerns about Integration

Critics of curriculum integration have identified a number of problems, ranging from scheduling to teacher preparation, related specifically to implementation in institutional settings (all of which integration's advocates are aware). In the view of curriculum integration critics, these practical problems bolster the arguments about linguistic confusion surveyed above.

1. Imposing Integration and the Problems of Inadequate Preparation

School districts sometimes simply mandate that teachers must integrate curriculum, without inviting those teachers to participate in the decision or giving them adequate and appropriate professional development related to integrative teaching or integrated curriculum (Gatewood, 1998; Stevenson & Carr, 1993). Such mandates, when unaccompanied by support, breed frustration among teachers who might otherwise favor integrative initiatives, and they move some teachers toward outright resistance. However, teachers can be excluded just as easily from discussion about subject-based teaching, reducing the seriousness with which one might take this particular type of resistance. That codicil notwithstanding, teachers at any level need both information (Chan, 2003; Drake, 1993) and support when they switch from subject-based teaching to more in-

tegrated teaching (Chan, 2003; Lonning, DeFranco & Weinland, 1998), not least because subject-based teaching is the traditional and expected teaching modality. Without help for a required change they can end up adrift or actively opposed to its implementation (Leung, 2006). Furthermore, integrated curriculum and instruction at any level may demand that educators teach outside their field of specialization (Lederman & Niess, 1997; Mason, 1996; Stevenson & Carr, 1993), a concern that can both be addressed by, and heard as a call for, interdisciplinary cooperation.

A sad but obvious irony runs through any story of implementation that fails because no one offered teachers appropriate preparation for teaching integratively or using integrated curriculum. Most teachers learn early in their teacher training, likely in an educational psychology class, that they must locate any new learning within their students' pre-existent cognitive structures. This idea runs back as far as Herbart's observation that in effective teaching "… a foundation of elementary knowledge is gradually laid sufficiently solid for later years to build upon" (Herbart, 1835/1901, p. 70). In *Democracy and Education*, Dewey said as much when he instructed teachers to begin "with the experience of the learner" (Dewey, 1916, pp. 257-258). Half a century after Dewey, Ausubel reminded educators that new learning requires attention to the psychological structures and representations of what people already know (Ausubel, 1964, 1968; Ausubel & Fitzgerald, 1962; Ausubel & Robinson, 1969). The irony is this: How can curriculum directors in departments of education and school jurisdictions ignore these elementary truisms studied by every preservice teacher? A school or jurisdiction implementing integrated curriculum or calling for integrative teaching requires its teachers to learn a new mindset, a new language and new instructional practices. No one should be surprised when teachers resist such initiatives if no one has provided those teachers with the needed conceptual scaffolding and tools (Holton & Clarke, 2004).

2. The Challenge of Obtaining Depth in Multiple Subjects

Teacher knowledge of subject areas presents a second, parallel problem. Many teachers, whether generalists (for example, in K-8 education) or specialists (for example, in secondary or higher education) simply do not have the knowledge to teach for depth in more than one field (Czerniak et al., 1999; Lederman & Niess, 1997; Mason, 1996; Relan & Kimptson, 1991; Stevenson & Carr, 1993). Given the nearly impossible challenge for an individual to prepare adequately in multiple disciplines, advocates of integration who view the curriculum as the locus of integration may find motivation to explore other models of integration,

especially interdisciplinary teaching and research teams. If they identify the student as the locus of integration, they may worry less about becoming expert in multiple disciplines, mainly because they are able to count on students' overall experience, including their exposure to a variety of faculty.

3. The Challenge for Teacher Education

Addressing these first two practical problems raises a third: Teacher education programs would need to alter their curriculum to prepare K-12 teachers for integrative teaching (Ascher & Flaxman, 1993; Bollen, 1977). Many places where teachers are taught would also need to change their instruction so that pre-service teachers witnessed integrated education being demonstrated by their own education professors (Kysilka, 1998). To their credit, some teacher-education programs have attended to their curriculum and instructional practices in view of pre-service teachers' needs to prepare for integrative teaching (Berlin & White, 2002; Czerniak et al., 1999; Stuessy, 1994).

4. Adequacy of Planning Time

A fourth question relates to planning time (Drake, 1993; Lounsbury, 1992). A commonplace among advocates of integrated education is that integrative teaching requires more planning time than subject-based teaching (Ackerman, 1989; Czerniak et al., 1999; George, 1996; Kysilka, 1998; Stevenson & Carr, 1993). One assumes, however, that K-12 educators trained to teach using integrative methods would learn time-saving strategies during their teacher education as well as during their in-service years.

5. Scheduling

The fifth practical issue also connects to planning time: Integrative teaching creates scheduling headaches when it must work inside a timetable built to suit a subject-based curriculum (Ackerman, 1989; Stevenson & Carr, 1993). There needs to be sufficient attention to scheduling in order to merge the two kinds of scheduling demands, which can prove to be a disincentive to educational administrators dealing with an already crowded curriculum and diminished resources.

6. Assessing Integrated Learning

Both practitioners and researchers have noted that assessment of learning raises a series of difficulties for anyone wanting to implement integrated cur-

riculum (Ascher & Flaxman, 1993; Drake, 1993; George, 1996; Hamilton, 1973; Kysilka, 1998; Leung, 2006; Mason, 1996; Stevenson & Carr, 1993; Vars, 1987). K-12 education has historically faced more such difficulties than higher education because jurisdictions, not schools, usually establish curriculum and reporting requirements (Ascher & Flaxman, 1993; Czerniak et al., 1999; Kysilka, 1998), a contrast that may diminish as universities focus more on standardizing content and assessment, especially in entry-level courses.

7. Demonstrated Effectiveness of Integrated Learning

A practical matter of a slightly different order from the previous issues is the measurement of teaching effectiveness. Advocates and critics alike have lamented the shortage of empirical research into the effectiveness of integrated teaching and curriculum compared to the volume of research into subject- and discipline-based curriculum (Berlin, 1994; N.D. Campbell, Heriot & Finney, 2006; Czerniak et al., 1999; George, 1996; Kysilka, 1998; Lederman & Niess, 1997; Relan & Kimptson, 1991). Vars, who supports curriculum integration, and is intimately aware of the state of research, saw a need in 1997 for more empirical research on many specific dimensions of integrated curriculum (Vars, 1997), despite another observer's conclusion that the body of empirical research had been growing throughout the 1990s (Brazee, 1997). Later, Ellis and Fouts still claimed that insufficient research existed to conduct a meta-analysis (Ellis & Fouts, 2001). Advocates and critics of integrated education alike might find a cautionary tale in these claims and counter-claims. If Ellis and Fouts are correct, then the advocates of integration need to produce more empirical research. If Ellis and Fouts are wrong, then critics of integrated education have their own homework to do. Extant literature reviews from the 1990s (Arhar, Johnston & Markle, 1992; Czerniak et al., 1999) do induce a suspicion that some critics are not sufficiently aware of the research literature such as the study by Schug and Cross (1998) who argue that the empirical research supports subject-based education.

At the end of the first section, I noted that advocates of curriculum integration did not consider the language-related difficulties sufficient reason to abandon either the term or the educational ideal. Integration's supporters consider these practical challenges in a similar light; none of these concerns is insurmountable. Some critics view them as a package and therefore conclude that the goal of integrated curriculum is either not worthwhile or cannot be achieved. Meanwhile, advocates of integration have already admitted and addressed most of the practical objections raised by critics of integration (Hayes Jacobs, 1989).

III. Psychological and Sociological Sources and Aspects of Resistance

The linguistic and practical dimensions of resistance to integration separate out more easily than do the epistemological, sociological, and psychological dimensions. These latter three fold back into each other at many points; nevertheless, we need to separate them for analytic purposes. I begin with a brief treatment of habituation and disciplinary identity, the two most important psychological aspects of resistance.

1. Habituation and Resistance

While hesitating to argue by means of commonplaces, one nevertheless points to the commonsense fact that people form habits, and therefore face challenges in thinking along unfamiliar lines. Habits and routines bring comfort and a measure of ease, familiarity and predictability to daily life. People who form their understanding of the relations between academic disciplines within a subject-based curriculum in a subject-mirrored organizational structure may resist changing their thought and work patterns for the purpose of integrated education (Stevenson & Carr, 1993; Van Zandt & Albright, 1996). Given the discipline-based mental and institutional frameworks within which many educators developed as professionals, the deep human need to classify (Hayakawa, 1964), and the presence of inertia in both people and organizations, resistance to curriculum integration should surprise no one. In fact, we might be surprised to hear of those who found it easy to abandon their taken-for-granted disciplinary framework in favor of new categories (Schütz, 1967). Of course, the habituation argument cuts both ways. Those disposed toward integrative thinking, or educated in interdisciplinary settings, might experience discipline-based curriculum or instruction as foreign and unsettling.

2. Disciplines as Identity

Considering disciplinary specialization and identity yields further insight into why teachers and professors might resist calls for curriculum integration or integrative philosophies of teaching. Shortly, when I consider the sociological dimension, I will explore how those who work in the same discipline form a community of scholars. The personal, psychological dimension of such membership is that those who work in a field derive their identity and collegial ties, to varying degrees, in part from their having specialized in that discipline

(Ascher & Flaxman, 1993; Beane, 1995; Hollinger, 1997; Kozoll & Osborne, 2004; Weber, 1919). My interest here is in how that identity leads one to resist integration. In brief, the subject-specialist who is identified, in part, by a disciplinary specialty stands to lose identity or to have that identity diminished by participation in integrative education (George, 1996). If one participates in integrative teaching, one may lose some of the prestige the academy grants to disciplinary specialists (Ascher & Flaxman, 1993; Clark, 2006; Snow, 1964), or face the charge of dilettantism (Ortega y Gasset, 1944), a situation that organizations such as the Association for Integrative Studies have worked to change. A related problem is that involvement in integrated education requires a concession that some aspects of one's own discipline may be better developed in another, and an acknowledgment that one is less expert than one may have thought; ironically, integration may result in loss of identity, at least until the subsequent formation of new cross-disciplinary identities.

3. Socialization into a Disciplinary Community

This discussion of disciplinary identity leads to a consideration of the first clearly sociological aspect of resistance: socialization into a community. While some academics find teaching and research isolating (D.T. Campbell, 1969; Lounsbury, 1992), most K-12 school teachers and most academics participate willingly, and even joyfully, in communities (Beane, 1995). In elementary schools, such communities usually take the form of the whole school staff or, in larger schools, of one's grade-level colleagues. For many secondary teachers and nearly all college professors, that community has historically included people who teach, research, and otherwise work within the same academic discipline (a situation now opening beyond disciplinary boundaries). As a result, a disciplinary community becomes a community of discourse, a group of people sharing a specialized language, sharing their own ways of conducting scholarly activity, and sharing a disciplinary worldview (D.T. Campbell, 1969; King & Brownell, 1966; Schwab, 1961, 1964). People trained—that is, socialized to some degree—within a specific discipline, adopt that discipline's preferred ways of understanding the world; they begin to think in the ways that specialists in their respective disciplines think. Without doubt, academic work moves ahead in part because disciplinary specialists work within communities, but some view these communities as in-groups and even tribes (D.T. Campbell, 1969), and tribalism does not move the work of the academy ahead. In fact, interdisciplinary inquiry moves the work of the academy ahead (Leshner, 2004), a point often ignored by those most vigilant about disciplinary boundaries.

Elaborating slightly on the matter of specialized languages used in the academy, the respective academic disciplines evolve their own specialized concepts and technical language, their own methods of determining what counts as knowledge and their own iconic figures and canonical works (Schwab, 1961). In effect, the academic disciplines effectively become different conversations conducted in different languages. Disciplinary language barriers, while not necessarily insuperable, appear to integration's critics as major barriers not only to curriculum integration but even to less ambitious forms of interdisciplinary conversation.

Historically, membership in a respective disciplinary community did not commence with one's first employment in the field; one was socialized into that membership. As one progressed in one's graduate and doctoral education, one did not simply study the contents of a discipline or learn to talk a certain language. Rather, one grew into a comprehensive cognitive framework of preferred explanations of how the world worked, and not necessarily into the limitations of that framework. In its most sinister form, this account left both fresh doctoral graduates and seasoned academics believing that their disciplines offered the best view of the world, the view that made the most sense, even the view that somehow explained all the other views. Growth in interdisciplinary and integrative graduate and doctoral programs in recent decades may mean a welcome end to such disciplinary provincialism.

My own experience bears witness to the power of disciplinary perspectives. The college interdisciplinary program that I directed caused offense to at least one professor who believed that integration of the undergraduate curriculum was the purview of the philosophy department alone. This professor used his classes as a venue to complain about the inclusion of integrative studies in the curriculum and the intrusion of two integrative conferences per year into the college schedule. One notices in such a case that the discipline that ostensibly offers the only sufficient basis for integrating the curriculum apparently also needs defending. Remove *only* from that account and a few academics still believe that their discipline offers the best window through which to make sense of the world. Whether intentionally or unwittingly, graduate and postgraduate education produce many disciplinary specialists who lack a broader cognitive perspective and may, in fact, be "cognitively adrift" (Peters, 1966, p. 31). One hopes that such situations are rare and becoming more so, as granting agencies increasingly recognize the value of interdisciplinary teaching and research (Hackett, 2000; Krull, 2000).

In higher education especially, but also in secondary education, departmental organization often reflects the disciplinary divisions, deepening the sense of

community and identity but with the concomitant cost of increased disciplinary turf protection and decreased cross-disciplinary communication (Ascher & Flaxman, 1993; Beane, 1995; Hamilton, 1973; Melville & Wallace, 2007). Members of such departments may benefit from conversation with other specialist colleagues sufficiently familiar with their work to push them to new levels of inquiry and understanding. Educators inclined toward interdisciplinary thought or formally involved with integrative curriculum and teaching may not find such conversations as easily, and may, in fact, experience isolation when they attend specialist meetings; in short they may initially lose their sense of community. But their broader perspective brings richness to their teaching and scholarship, and the number of interdisciplinary conversation partners continues to grow year by year.

IV. Epistemological Roots of Resistance to Integration

One observer has suggested that epistemological considerations are the most contentious of all the objections raised against curriculum integration (Beane, 1995). I turn now to questions that have opened up debates about the epistemic status of the academic disciplines in relation to ontology, and about social, economic, and gender perspectives on epistemology.

1. Disciplines Reflect Realities of the Real World

The most fundamental objection raised by the epistemic critics begins with a premise shared by supporters of integrated curriculum: Academic disciplines represent epistemological divisions that, in turn, reflect fundamentally different aspects of the character of the world (Hughes, 1978; Schug & Western, 2002). After agreeing that the world has different aspects and that the academy organizes its work in specialized disciplines suited to the study of those aspects, critics and supporters of integration disagree about how closely curriculum and instruction should parallel epistemological and ontological divisions. In the strongest version of this argument, the claim is made that integrated curricula ignore or erase inviolable disciplinary boundaries and thereby ignore ontology. Integrated curricula are, so to speak, against nature.

More than a generation ago, Joseph Schwab offered a much more moderate version of this ontic-epistemic-curricular link:

> … the integration of previously separate bodies of knowledge by new and unifying conceptions should not blind us to the possibility that some of the differences we recognize among phenomena may be genuine;

> some differentiation of disciplines may be perennial. There really may be joints in nature, a forearm, then an elbow, and then an upper arm. Science, ethics, and aesthetics may indeed represent three widely variant objects of inquiry. The doctrine of the unity of science, which insists on a unification of all knowledge, is either a dogma or hope but not a fact. There are no data from which to conclude decisively that eventually all the disciplines will become or should become one. (1964, p. 10)

With Schwab, most who advocate curriculum integration recognize the genuine differences between phenomena; they take ontic differences as real. However, they do not find in those differences a compelling argument against curriculum integration. Rather, they see curriculum integration as a question of how best to study and come to understand the world structured as it is, perhaps leaving critics of integration curriculum with the task of answering why ontic or epistemic differences necessarily imply non-integrative curriculum. To his credit, Schwab recognized that school subjects are not academic disciplines and, in doing so, allowed (at least implicitly) that subjects may be integrative (as has another defender of disciplines, Gozzer, 1982). To his further credit, Schwab and others sought ways to reconcile their understanding of epistemology with the psychological and pedagogical dimensions of learning and teaching (Ford & Pugno, 1964). One still asks what answers are available for the ontic-epistemic critics of integration. I will mention four additional possible approaches.

2. Integration Includes Disciplinary Approaches

One approach might point out that advocates of curriculum integration are not arguing against the usefulness of the academic disciplines for gaining and organizing knowledge. I noted at the start of this section that at the levels of ontology and epistemology, advocates generally agree with critics of integration that the world has distinct aspects (Dooyeweerd, 1953). They also agree that, over centuries, scholars have evolved specialized, disciplined and, while limited, still immensely fruitful ways of gazing at the respective aspects of the world in which they find themselves (Sweetman, 1995). Having recognized these ontic and epistemic realities, advocates of integration then argue that ontology and epistemology do not necessarily point to a discipline-based curriculum, that disciplines and integration are not mutually exclusive processes and that integrative or interdisciplinary teaching and learning do not violate ontic or epistemic categories.

3. Disciplinarity Is a Social Construction

Similarly, one might argue that the disciplinary boundaries are not ontologically necessary but are social constructions, the products of historical and discursive processes. At this point, critics of curriculum integration might counter that we have not yet found ways to obtain and organize knowledge superior to the academic disciplines (Gardner & Boix-Mansilla, 1994), a point with which many advocates of integration might agree. Superiority does not equal philosophical necessity, however, and while the scholarly disciplines remain limited or focused ways of gazing at and knowing the world, they bear no necessary relation to their respective subject matters and can, in fact, be employed for dubious social purposes (Bernstein, 1971, 1977, 1990). Although I have rehearsed it only briefly here, this sociological response to the ontic critique of integration may suffice in some circumstances.

4. Knowledge as Gendered

Feminist epistemologists have offered another possible approach to ontic-epistemic objections to integrated curriculum. Feminist and non-feminist scholars alike have argued that gender powerfully determines what is considered knowledge (Belenky, Clinchy, Goldberger & Tarule, 1986). Code has explored in depth some possible differences between female and male approaches to epistemology and has argued that distinguishing where gender ends and epistemology begins is likely impossible (Code, 1988, 1991). If these arguments about gendered differences in epistemology are correct, then feminist work warrants serious consideration by anyone wanting to understand particular instantiations of resistance, which come cloaked in the language of ontology, epistemology, or disciplinary boundary maintenance.

5. Courses Are Not Confined to Disciplines

A final approach to the argument that the connections between ontology, epistemology, and the disciplines implicitly prohibit integration might run this way. Any K-12 subject or university course is not coextensive with an academic discipline. As Beane argues, the course and the discipline serve different purposes (Beane, 1995). Sometimes the course offers a simplified version of what disciplinary specialists know or do; other times the course offers a subset or selection of content. Sometimes, the course actually draws on several disciplines. Beane notes as well that subject divisions are often more rigid than the nature of academic disciplines, whose workers regularly use concepts from

other disciplines. Beane's approach thus honors the disciplines while preserving space for integrated curriculum, an approach recognized by some leading philosophers of education (Hirst, 1974a; Pring, 1973, 1976). If one can, in fact, retain a place for the disciplines while promoting curriculum integration, then defending the subjects on the grounds that to do so is to defend the disciplines may be somewhat hypocritical (D.T. Campbell, 1969).

The epistemological arguments I have reviewed here do not present a telling challenge to curriculum integration, most of whose advocates recognize the disciplines for what they are and value the fruit they have produced. As was true for the linguistic objections I cataloged in the first section, the practical concerns I reviewed in the second, and the psychological and sociological issues I treated in the third, these philosophical objections fail to provide a warrant for abandoning integration.

V. Conclusion

I have reviewed four major kinds of resistance to or criticisms of curriculum integration, mentioning along the way some of the rejoinders offered by its advocates. I now return to an issue I raised in the second section of the paper, the matter of empirical research. I support those who have called for more empirical research into integrated curriculum and integrative teaching (Vars, 1997). The frequency with which those in teaching and educational administration hear calls for *assessment*, *accountability,* and *results* indicates that those who pay for education at all levels want to know what works. Even if these calls arise out of market pragmatism, supporters of integrated curriculum and integrative teaching need to show that curriculum integration leads to improved learning, whether in K-12 or higher education.

With the passage of time, at least two recent, positive developments should continue to provide an answer to some of the concerns raised by critics of curriculum integration, integrative teaching, and interdisciplinarity. First, interdisciplinary programs in higher education continue to gain support and recognition. As larger numbers of students graduate from such programs, criticism of integrated curriculum should diminish. Presumably, this increase in recognition will be paralleled by growing expertise among those educators involved in curriculum integration, integrative teaching, and interdisciplinarity at all levels. Some critics may find such numbers and expertise persuasive.

Regardless of the success or popularity that interdisciplinarity, curriculum integration, or integrative teaching gain, some critics will never be persuaded.

As my review of the various roots and forms of objections to integration makes clear, some resistance to integration grows from deep soil. No one should expect all to be persuaded of the value of integration. Nevertheless, as advocates of integration continue to respond to their critics' concerns, and continue to work at realizing their own integrative vision for learning, integrative curriculum and instruction will continue to improve, ultimately increasing students' grasp of disciplinary and interdisciplinary knowledge.

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References

Ackerman, D.B. (1989). Intellectual and practical criteria for successful curriculum integration. In H.H. Jacobs (Ed.), *Interdisciplinary curriculum: Design and implementation* (pp. 25-37). Alexandria, VA: ASCD.

Alpren, M. (1967). General education. In M. Alpren (Ed.), *The subject curriculum: Grades K-12* (pp. 384-393). Columbus, OH: Merrill.

Arhar, J., Johnston, J. & Markle, G. (1992). The effects of teaming as a school intervention to increase the social bonding of middle level students. In J.H. Lounsbury (Ed.), *Connecting the curriculum through interdisciplinary instruction* (pp. 23-35). Columbus, OH: National Middle School Association.

Ascher, C. & Flaxman, E. (1993). A time for questions: The future of integration and technical preparation—A report of a three-day summit. New York: Institute on Education and Economy, Teachers College, Columbia University, New York.

Ausubel, D.P. (1964). Some psychological aspects of the structure of knowledge. In S. Elam (Ed.), *Education and the structure of knowledge* (pp. 220-262). Chicago: Rand McNally.

Ausubel, D.P. (1968). *Educational psychology: A cognitive view*. New York: Holt, Rinehart & Winston.

Ausubel, D.P. (1969). *Readings in school learning*. New York: Holt, Rinehart & Winston.

Ausubel, D.P. & Fitzgerald, D. (1962). Organizer, general background, and antecedent learning. *Journal of Educational Psychology, 53*, 243-249.

Ausubel, D.P. & Robinson, F.G.R. (1969). *School learning*. New York: Holt, Rinehart & Winston.

Badley, K. (1986). *Integration and the integration of faith and learning.* Unpublished dissertation, University of British Columbia, Vancouver.

Badley, K. (1994). The faith/learning integration movement in Christian higher education: Slogan or substance? *Journal of Research on Christian Education, 3*(1), 13-33.

Beane, J.A. (1995). Curriculum integration and the disciplines of knowledge. *Phi Delta Kappan, 76*(8), 616-622.

Belenky, M.F., Clinchy, B.M., Goldberger, N.R. & Tarule, J.M. (1986). *Women's ways of knowing: The development of self, voice, and mind*. New York: Basic Books.

Berlin, D.F. (1994). The integration of science and mathematics education: Highlights from the NSF/SSMA Wingspread conference plenary papers. *School Science and Mathematics, 94*(1), 32-35.

Berlin, D.F. & White, A.L. (2002). Attitudes toward integration as perceived by preservice teachers enrolled in an integrated mathematics, science, and technology teacher education program. *Science Educator, 11*(1), 32-40.

Bernstein, B. (1971). *On the classification and framing of educational knowledge*. London: Collier-Macmillan.

Bernstein, B. (1977). *Class, codes and control: Vol. 3. Towards a theory of educational transmissions*. London: RKP.

Bernstein, B. (1990). *The structuring of pedagogic discourse*. New York: Routledge.

Bertrand, A. (1898). *L'enseignement integral*. Paris: Germer Baillfire.

Bollen, F.A. (1977). Does 'science for all' have to be 'unified science'? *Education in Science, 75*, 25-16.

Brazee, E. (1997). Curriculum for whom? In *What current research says to the middle level practitioner* (pp. 187-202). Columbus, OH: National Middle School Association.

Campbell, D.T. (1969). Ethnocentrism of disciplines and the fish-scale model of omniscience. In M. Sherif & C.W. Sherif (Eds.), *Interdisciplinary relationships in the social sciences* (pp. 328-348). Chicago: Aldine.

Campbell, N.D., Heriot, K.C. & Finney, Z.R. (2006). In defense of silos: An argument against the integrative undergraduate business curriculum. *Journal of Management Education, 30*(2), 316-332.

Chan, K.S.J. (2003). *Integrating the curriculum: How do secondary school teachers' beliefs influence the integration?* Unpublished dissertation, Chinese University of Hong Kong, Hong Kong.

Ciccorico, E.A. (1970). Integration in the curriculum. *Main Currents, 27*(2), 60-62.

Clark, W. (2006). *Academic charisma and the origins of the research university*. Chicago: University of Chicago Press.

Clarke, B. (1979). Eccentrically contested concepts. *British Journal of Political Science, 9*(1), 122-126.

Code, L. (1988). *Epistemic responsibility*. Hanover, NH: Brown University Press/University Press of New England.

Code, L. (1991). *What can she know? Feminist theory and the construction of knowledge*. Ithaca, NY: Cornell University Press.

Counelis, S.J. (1979). Education about education. *Educational Studies, 9*, 407-424.

Criley, M.E. (2007). *Contested concepts and competing conceptions*. Unpublished dissertation, University of Pittsburgh, Pittsburgh, PA.

Czerniak, C.M., Weber, W.B., Sandmann, A. & Ahern, J. (1999). A literature review of science and mathematics integration. *School Science and Mathematics, 99*(8), 421-430.

Davis, J.R. (1995). *Interdisciplinary courses and team teaching: New arrangements for learning*. Phoenix: Oryx Press.

Dewey, J. (1902). *The child and the curriculum*. Chicago: University of Chicago Press.

Dewey, J. (1916). *Democracy and education*. Champaign, IL: Project Gutenberg.

Dooyeweerd, H. (1953). *A new critique of theoretical thought: Vol. 1. The necessary presuppositions of philosophy* (D.H. Freeman & W.S. Young, Trans.). Paris: Uitgeverij H.J.

Drake, S.M. (1993). *Planning integrated curriculum: The call to adventure*. Alexandria, VA: ACSD.

Dressel, P.L. (1958). Integration: An expanding concept. In N.B. Henry (Ed.), *The integration of educational experiences, Yearbook of the National Society for the Study of Education, 57th in series, pt. 3.* (pp. 251-263). Chicago: University of Chicago Press.

Dworkin, G. (1988). *The theory and practice of autonomy*. New York: Cambridge University Press.

Ellis, A.K. & Fouts, J.T. (2001). Interdisciplinary curriculum: The research base. *Music Educators Journal, 87*(5), 22-26.

Erb, T. (1996). Following the bandwagon of curriculum integration: Beautiful music or deep ruts? *Middle School Journal, 28*(1), 2.

Ezcurdia, M. (1998). The concept-conception distinction. *Philosophical Issues, 9*, 187-192.

Fogarty, R. (1991a). *The mindful school: How to integrate the curriculum*. Palatine, IL: Skylight Publishing.

Fogarty, R. (1991b). Ten ways to integrate curriculum. *Educational Leadership, 49*(2), 61-65.

Ford, G.W. & Pugno, L. (Eds.). (1964). *The structure of knowledge and the curriculum*. Chicago: Rand-McNally.

Gaebelein, F. (1954). *The pattern of God's truth*. New York: Oxford University Press.

Gallie, W.B. (1956). Art as an essentially contested concept. *The Philosophical Quarterly, 6*, 97-114.

Gallie, W.B. (1962). Essentially contested concepts. In M. Black (Ed.), *The importance of language* (pp. 121-146). Englewood Cliffs, NJ: Prentice-Hall.

Gardner, H. & Boix-Mansilla, V. (1994). Teaching for understanding in the disciplines—and beyond. *Teachers College Record, 96*(2), 198-218.

Gatewood, T. (1998). How valid is integrated curriculum in today's middle schools? *Middle School Journal, 29*(4), 38-41.

George, P.S. (1996). The integrated curriculum: A reality check. *Middle School Journal, 28*(1), 12-19.

Gowin, D.B. (1961). Teaching, learning, and thirdness. *Studies in Philosophy and Education, 1*(3), 87-113.
Gowin, D.B. (1962). Teaching, learning and thirdness revisited. *Studies in Philosophy and Education, 2*(3), 287-298.
Gozzer, G. (1982). Interdisciplinarity: A concept still unclear. *Prospects, 12*(3), 281-292.
Gray, J. (1978). On liberty, liberalism and essential contestability. *British Journal of Political Science, 8*(4), 385-402.
Guthrie, D.S. & Noftzger, R.L., Jr. (Eds.). (1992). *Agendas for church-related colleges and universities*. San Francisco: Jossey-Bass.
Hackett, E.J. (2000). Interdisciplinary research initiatives at the U.S. National Science Foundation. In P. Weingart & N. Stehr (Eds.), *Practising interdisciplinarity* (pp. 248-259). Toronto: University or Toronto Press.
Hadorn, G.H., Hoffman-Riem, H., Biber-Klemm, S., Grossenbacher-Mansuy, W., Joye, D., Pohl, C., et al. (Eds.). (2008). *Handbook of transdisciplinary research*. London: Springer.
Hamilton, D. (1973). The integration of knowledge: Practice and problems. *Journal of Curriculum Studies, 5*(2), 146-155.
Harvill, H. (1954). Origins of the core concept. *Social Education, 18*(4), 161-164.
Hayakawa, S.I. (1964). *Language in thought and action*. New York: Harcourt, Brace & World.
Hayes Jacobs, H. (Ed.). (1989). *Interdisciplinary curriculum: Design and implementation*. Alexandria, VA: ASCD.
Hayes Jacobs, H. (1997). *Mapping the big picture: Integrating curriculum & assessment, K-12*. Alexandria, VA: Association for Supervision and Curriculum Development.
Henry, N.B. (1958). *The integration of educational experiences, Yearbook of the National Society for the Study of Education, 57th in series, pt. 3.* Chicago: University of Chicago Press.
Herbart, J.F. (1835/1901). *Outlines of educational doctrine* (A.F. Lange, Trans.). New York: Macmillan.
Hirst, P.H. (1974a). Curriculum integration. In P.H. Hirst (Ed.), *Knowledge and the curriculum* (pp. 132-171). London: RKP.
Hirst, P.H. (1974b). *Knowledge and the curriculum*. London: RKP.
Hollinger, D.A. (1997). The disciplines and the identity debates, 1970-1995. In T. Bender & C.E. Schorske (Eds.), *American academic culture in transformation: Fifty years, four disciplines*. Princeton, NJ: Princeton University Press.
Holmes, A.F. (1987). *The idea of a Christian college*. Grand Rapids, MI: Eerdmans.
Holton, D. & Clarke, D. (2004). Scaffolding and metacognition. *International Journal of Mathematics Education in Science and Technology, 37*(2), 127.
Hopkins, L.T. (Ed.). (1937). *Integration: Its meaning and application*. New York: Appleton Century Crofts.
Hughes, A.S. (1978). Separate subject and integrated approaches to social education. *History and Social Studies Teacher, 13*(3), 163-167.

Ingram, J.B. (1979). *Curriculum integration and lifelong education: A contribution to the improvement of school curricula* (1st ed.). New York: Pergamon.

King, A.R., Jr., & Brownell, J.A. (1966). *The curriculum and the disciplines of knowledge*. Huntingdon, NY: Krieger.

Klein, J.T. (1990). *Interdisciplinarity: History, theory, and practice*. Detroit: Wayne State University Press.

Klein, J.T. (2002). *Interdisciplinary education in K-12 and college: A foundation for K-16 dialogue*. New York: The College Board.

Komisar, B.P. & McClellan, J.E. (1961). The logic of slogans. In B.O. Smith & R.H. Ennis (Eds.), *Language and concepts in education* (pp. 195-214). Chicago: Rand-McNally.

Kozoll, R.H. & Osborne, M.D. (2004). Identity with discipline—finding meaning in science: Lifeworld, identity and self. *Science Education, 88*(2), 157-181.

Krull, W. (2000). Beyond the ivory tower: Some observations of external funding of interdisciplinary research in universities. In P. Weingart & N. Stehr (Eds.), *Practising interdisciplinarity*. Toronto: University or Toronto Press.

Kysilka, M.L. (1998). Understanding integrated curricula. *The Curriculum Journal, 9*(2), 197-209.

Lamdin, L. (1982). Curricular coherence and the individual student. In J.W. Hall & B.L. Kevles (Eds.), *In opposition to the core curriculum* (pp. 69-83). Westport, CT: Greenwood.

Lederman, N.G. & Niess, M.L. (1997). Integrated, interdisciplinary, or thematic instruction? Is this a question or is it questionable semantics? *School Science and Mathematics, 99*(8), 421-429.

Leshner, A. (2004, February 6). Science at the leading edge. *Science*, 729.

Leung, W.L.A. (2006). Teaching integrated curriculum: Teachers' challenges. *Pacific Asian Education, 18*(1), 88-102.

Lonning, R.A., DeFranco, T.C. & Weinland, T.P. (1998). Development of theme-based, interdisciplinary, integrated curriculum. *School Science and Mathematics, 98*(6), 312-319.

Lounsbury, J.H. (1992). Interdisciplinary instruction: A voyage not a harbor. In J.H. Lounsbury (Ed.), *Connecting the curriculum through interdisciplinary instruction* (pp. 155-158). Columbus, OH: National Middle School Association.

Lukes, S. (1974). *Power: A radical view*. London: Macmillan.

Macia, J. (1998). On concepts and conceptions. *Philosophical Issues: Concepts, 9*, 175-185.

Mason, T.C. (1996). Integrated curricula: Potential and problems. *Journal of Teacher Education, 47*(4), 263-270.

McBrien, J.L. & Brandt, R.S. (1997). *The language of learning: A guide to education terms*. Alexandria, VA: Association for Supervision and Curriculum Development.

Megroth, E.J. & Washburne, V.Z. (1949). Integration in education. *Journal of Educational Research, 43*, 81-92.

Melville, W. & Wallace, J. (2007). Metaphorical duality: High school subject departments as both communities and organizations. *Teaching and Teacher Education, 23*, 1193-2005.

Moran, J. (2002). *Interdisciplinarity: The new critical idiom*. New York: Routledge.

Newell, W.H. (Ed.). (1998). *Interdisciplinarity: Essays from the literature*. New York: The College Board.

Ortega y Gasset, J. (1944). *The mission of the university*. Princeton, NJ: Princeton University Press.

Palmer, P.J. (1998). *The courage to teach*. San Francisco: Jossey-Bass.

Peters, R.S. (1966). *Ethics and education*. London: George Allen & Unwin.

Phenix, P.H. (1964). *Realms of meaning: A philosophy of the curriculum for general education*. New York: McGraw-Hill.

Piaget, J. (1960). *The child's conception of number* (C. Gattegno & F.M. Hodgson, Trans.). New York: Humanities Press.

Pohl, C. & Hadorn, G.H. (2007). *Principles for designing transdisciplinary research* (A. Zimmerman, Trans.). Munich: Oekum.

Pring, R. (1973). Curriculum integration. In R.S. Peters (Ed.), *The philosophy of education* (pp. 123-149). London: Oxford University Press.

Pring, R. (1976). Integrating the curriculum. In R. Pring (Ed.), *Knowledge and schooling* (pp. 99-114). London: Open Books.

Rawls, J. (1999). *A theory of justice* (2nd ed.). Cambridge, MA: Belknap Press.

Relan, A. & Kimptson, R. (1991). *Curriculum integration: A critical analysis of practical and conceptual issues.* Paper presented at the annual meeting of the American Educational Research Association.

Robinson, K. (1997). The task-achievement analysis of education. *Educational Philosophy and Theory, 4*(2), 17-24.

Ryle, G. (1949). *The concept of mind*. New York: Barnes & Noble.

Schug, M.C. & Cross, B. (1998). The dark side of curriculum integration in social studies. *Social Studies, 89*(2), 54-57.

Schug, M.C., & Western, R.D. (2002). The homeless social studies teacher: How Muzak progressivism has harmed social studies education. *Social Studies, 93*(6), 251-256.

Schütz, A. (1967). *The phenomenology of the social world* (G. Walsh & F. Lehnert, Trans.). Evanston, Il: Northwestern University Press.

Schwab, J.J. (1961). *Education and the structure of the disciplines*. Washington, DC: National Education Association.

Schwab, J.J. (1964). Structure of the disciplines: Meanings and significances. In G.W. Ford & L. Pugno (Eds.), *The structure of knowledge and the curriculum* (pp. 6-30). Chicago: Rand-McNally.

Snow, C.P. (1964). *The two cultures*. Cambridge: Cambridge University Press.

St. Clair, B. & Hough, D.L. (1992). *Interdisciplinary teaching: A review of the literature*. Springfield, MO: Department of Curriculum and Instruction, Southwest Missouri State University.

Stevenson, C. & Carr, J.F. (1993). *Integrated studies in the middle grades: Dancing through walls*. New York: Teachers College Press.

Stuessy, C. (1994). A model for preservice teacher preparation that integrates the teaching and learning of mathematics and science. *School Science and Mathematics, 94*(1), 30-31.

Swanton, C. (1995). On the 'essential contestedness' of political concepts. *Ethics, 95*, 811-827.

Sweetman, R. (1995). Conversation about the modal aspects. Toronto: Institute for Christian Studies.

Tchudi, S. (1991). *Travels across the curriculum*. New York: Scholastic.

Van Zandt, L.M. & Albright, S.B. (1996). The implementation of interdisciplinary curriculum and instruction. In P.S. Hlebowitsh & W.G. Wraga (Eds.), *Annual review of research for educational leaders* (pp. 165-201). New York: Scholastic/National Association of Secondary School Principals.

Vars, G. (1987). *Interdisciplinary teaching in the middle grades: Why & how*. Columbus, OH: National Middle School Association.

Vars, G. (1996). The effects of interdisciplinary curriculum and instruction. In P.S. Hlebowitsh & W.G. Wraga (Eds.), *Annual review of research for school leaders* (pp. 147-164). New York: Scholastic/National Association of Secondary School Principals).

Vars, G. (1997). The effects of interdisciplinary curriculum and instruction. In J.L. Irvin (Ed.), *What current research says to the middle level practitioner* (pp. 179-186). Columbus, OH: National Middle School Association.

Weber, M. (1919). Science as a vocation. In P. Lassman, I. Velody & H. Martins (Eds.), *Max Weber's 'Science as a vocation.'* London: Unwin Hyman.

Wraga, W.G. (1996). A century of interdisciplinary curricula in American schools. In P.S. Hlebowitsh & W.G. Wraga (Eds.), *Annual review of research for educational leaders* (pp. 117-145). New York: Scholastic/National Association of Secondary School Principals.