

Interdisciplinary Verses Disciplinary Approaches: Why it Matters in Classroom Management

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Abstract: How do interdisciplinarity and disciplinarity differ? Although both are approaches to problem solving, research and teaching, the differences and relative merits of interdisciplinary and disciplinary approaches to knowledge are hotly contested by advocates for each approach.

Classroom management is a problem most often viewed from the disciplinary lens of education. Yet, it is one of the most difficult concepts for student teachers to grasp. When classroom management is viewed from an interdisciplinary lens, its true complexities become clear.

Key words: interdisciplinary, disciplinary, classroom management, multidisciplinary, pluridisciplinarity, transdisciplinarity

Résumé : Comment l'interdisciplinarité et la disciplinarité diffèrent-elles ? Bien que les deux approches servent dans la résolution de problèmes, dans la recherche et l'enseignement, les différences et mérites relatifs des approches interdisciplinaires et disciplinaires au savoir sont très contestés par les partisans de l'une et l'autre approches.

La gestion de classe est un problème souvent envisagé dans la perspective disciplinaire de l'éducation. Pourtant, c'est un des concepts des plus difficiles à saisir par les étudiants maîtres. Quand la gestion de classe est envisagée dans une perspective interdisciplinaire, sa complexité devient évidente.

Mots-clés : interdisciplinarité, disciplinarité, gestion de classe, multidisciplinarité, pluridisciplinarité, transdisciplinarité

Confusion exists regarding how to utilize interdisciplinarity as a theory and or method. Adding to this confusion is that fact that there are several different types of interdisciplinarity and no universal definition. Conversely, disciplines have a long history and very specific theories and approaches. Individuals trained in a discipline have undergone preparation in order to become a member and have an interest in seeing the discipline remain the same. To such individuals, the concept of interdisciplinarity is shallow, pedagogically doubtful, and maybe a little bit threatening. Interdisciplinarity has the flexibility to foster the creation of new knowledge at a time when the problems of the real world are becoming increasingly complex.

Classroom management is an example of a complex problem continuously evolving on a day-to-day basis. Educational approaches to the problem of classroom managements consist of strategies developed by scholars and or experienced teachers. Such approaches represent the classroom as static, when in fact it is different from day-to-day depending on a multiplicity of factors not the least of which are the teacher and student's home life. When classroom management is viewed from an interdisciplinary lens it becomes clear that it is a problem that requires a synthesis of information including: knowledge of the readiness of students in the classroom, the classroom management style of the student teacher, influences from associate teachers, faculty, courses and Ministry policies. Only when a teacher is able to synthesize all of this information are they able to develop their own classroom management style and create new knowledge.

Defining Interdisciplinarity

Interdisciplinarity combines the work of one or more disciplines in its approach. Disciplinarity approaches problems from the concepts, theories and methods, of one discipline. The debate regarding the

strengths and weaknesses of each approach is heated and controversial within the academic community.

There is no one universal definition for interdisciplinary (Weingart & Stehr, 2000; Shailer, 2005) and as a result, there is confusion regarding its meaning. Interdisciplinary is the result of the inability of any one discipline to address complex problem.

Salter and Hearn (1996) suggest that discussions about the meaning of interdisciplinarity and disciplinarily are highly abstract, which may lend to the confusion. It is an important debate however, for as Shailer (2005) explains, “The disciplinary/interdisciplinary debate directly challenges nothing less than the way understanding production, and dissemination of knowledge is structured within the academy, as well as the way and extent to which university researchers collaborate with other (non-institutional) producers of knowledge in society” (p. 1).

According to Hayes (2002) as cited in Chettiparumb (2007), interdisciplinarity recognizes there is no absolute concept of truth, instead there are many versions, depending on the perspective. Klein (1990) explains this wide spread confusion about the concept of interdisciplinarity exists for three reasons: uncertainty about the meaning of the term, unfamiliarity with interdisciplinarity scholarship and the lack of a unified a body of discourse. Salter and Hearn (1996) contend interdisciplinarity is not one thing. “It is best understood as a variety of different ways of examining – and perhaps confronting – the establishment, content, parameters and power of disciplines and the prevailing approaches to research they engender” (p. 38).

Although there is wide spread confusion about interdisciplinarity, Salter and Hearn (1996) indicate there are some certainties. Firstly, interdisciplinarity is not a new phenomenon; in fact, Weingart and Stehr (2000) trace the origin of the word to Robert Woodsworth

and the American Social Science Research Council in the 1920's. Klein (1990) traces the origin of interdisciplinarity to the post World War II period when it became increasingly clear that complex problems such as war, labour, propaganda, population shifts, housing, social welfare and crime, were larger than any one discipline. Another certainty is that interdisciplinarity is of major interest to researchers.

Interdisciplinarity does not exist only in the margins of disciplines nor does it always involve teams. It is often grounded in the same social and political commitments as disciplines. In fact, some but not all interdisciplinary fields become disciplines. Sociology, Canadian Studies and Women's Studies are examples of interdisciplinary fields that evolved into disciplines.

According to Salter and Hearn (1996) interdisciplinarity falls into one of two camps, instrumental and conceptual. The instrumental view of knowledge does not seek to challenge disciplinary boundaries or epistemological assumptions. Instead, it responds to the external demands of society and seeks to address real world problems. This approach acknowledges its basis in disciplinarity and as a result, synthesis is not expected. From this viewpoint, disciplinarity is a barrier to the evolution of knowledge. New disciplines can arise as a result of instrumental interdisciplinarity.

Conceptual interdisciplinarity emphasizes the synthesis and creation of new knowledge. Klein (2005) refers to this as critical interdisciplinarity. Instead of being concerned with real world problems, it is rooted in concerns of the university or research institute. It poses an epistemological challenge to disciplinarity. This viewpoint takes issue with the existing organization of knowledge into disciplines and may take the form of postmodernism or post structuralism. The goal of this type of interdisciplinarity is a unified theory of knowledge (Salter & Hearn, 1996).

Klein (1990) views interdisciplinarity as a process; she states that, “Interdisciplinarity is neither a subject matter nor a body of content. It is a process for achieving and integrating synthesis, a process that usually begins with a problem, question, topic or issue” (p. 188). Klein (2005) explains that in interdisciplinarity disciplinary data, methods, tools, concepts and theories create a holistic view of a complex issue or problem.

Klein (1990) references the Organization for Economic Development (1971) who suggests interdisciplinarity arose as a result of the rigidity of disciplines, student pressure against the parcelization of knowledge, budget pressures from universities to share resources, educational needs related to real world problems and new subjects that cannot be contained within a single discipline.

Salter and Hearn (1996) explain that interdisciplinarity can arise when researchers argue that a particular topic of study has been neglected or when a constellation of topics, methods and perspectives that prevails within a specific discipline is challenged. Cultural studies was developed because other disciplines concerned with culture including: anthropology, sociology, history, political science and literary studies, did not address cultural practice adequately. Interdisciplinarity can arise when individuals from one discipline come to appreciate the similarity between their perspectives or when researchers question the value of institutional factors that support divisions between disciplines. Interdisciplinarity can occur when researchers raise issues about the relationship between disciplinarity and systems of power. Finally, interdisciplinarity can arise when scholars feel overly constrained by the boundaries of their disciplines.

Klein (2005) explains that the dominant trend in higher education for much of the twentieth century has been the growth of specialization.

According to Weingart and Stehr (2000) increasing specialization is an impediment to innovation. Klein (2005) argues that the challenges of the modern world including increased interest in ways that people make and communicate meaning, necessitate an alternative to specialization within disciplines. New areas of scholarship such urban studies, social history and film studies do not neatly fit into disciplinary boundaries. Newell (1983) states, "The purpose of interdisciplinary studies is to address questions that transcend disciplinary boundaries" (p. 110).

Strathern (2004) suggests that when disciplines continually specialize or move inward, they become static or cold. They cease to be innovative and create new knowledge. When knowledge is used to respond to a problem or crisis, it requires creativity or innovation. At this point new knowledge can be created.

Strathern (2004) describes the static or cold state as Mode 1 and the point where new knowledge is created as in flux or hot as Mode 2. With time, Mode 2 becomes static and moves back to a Mode 1 situation, until a new problem requires innovation or new knowledge and Mode 2 is entered into again. In this way, knowledge fluctuates between Mode 1 or static and Mode 2 or a state of flux. Similarly, Morin (2008) states, "When certain levels of fluctuation are created by increasing complexity, a critical or bifurcation point is reached. At that point, the system can move in any one of several directions until a new more complex order may be established after a period of turbulence. If a higher order of organization does not emerge, the system returns to a previous level of organization" (p. xxxvi).

Klein (1993) explains that when disciplines focus inward or specialize they often fragment; it is at this point when disciplinary boundaries become blurred and new knowledge can be created. New programs, centers and activities proliferate, yet interdisciplinarity is impeded.

Weingart and Stehr (2000) suggest interdisciplinarity and specialization are parallel, mutually reinforcing strategies. “The relationship between disciplinary and interdisciplinarity is not a paradox but a productive tension characterized by complexity and hybridity” (p. 7).

Salter and Hearn (1996) define interdisciplinarity “as the interaction between two or more disciplines. This interaction may range from the simple communication of ideas to the mutual integration of organizing concepts, methodologies, procedures, epistemology, terminology, data, and the organization of research and education in a fairly large field” (p. 186). Newell and Green (1982) define interdisciplinary studies as, “inquiries which draw upon two or more disciplines and which lead to an integration of disciplinary insights” (p. 24).

Rhoten (2004) explains that the number of disciplines combined to contribute to interdisciplinarity can range from two to twenty. Interdisciplinary brings together several disciplines and groups them together based on similar interests or approaches. Several theory oriented disciplines such as philosophy, history and ethics may come together to work on an interdisciplinary issue, or conversely several practice-oriented disciplines may come together to address a problem. There is no formula for combining disciplines to create an interdisciplinary approach, “Interdisciplinarity can thus have different types of relations with disciplinarity, each of which involves different scientific levels with accompanying differences in the types of challenges faced” (Rhoten, p. 19).

Interdisciplinarity is often engaged in order to address a problem. Strathern (2004) indicates that at its core, interdisciplinarity has a problem solving nature that is not only concerned with an end, but also the means of solving the problem. Besselaar and Heimeriks (2001) explain that one of the central characteristics of interdisciplinarity is that it is application oriented. Newell (1983) suggests that it is in this

problem-solving conception that interdisciplinary studies are at its most useful.

While there is no universally accepted definition of interdisciplinarity, there is agreement of its importance in the creation of new knowledge. Interdisciplinarity can take many forms but arises from the necessity to approach problems or issues from multiple viewpoints.

Types of Interdisciplinarity

There are many classifications of interdisciplinarity often differentiated by terms such as multidisciplinary, pluridisciplinary and transdisciplinary. Besselaar and Heimeriks (2001) explain that types of interdisciplinarity can be differentiated according to the level of integration. They suggest that a multidisciplinary approach may incorporate different disciplinary approaches, but does not integrate the theories or findings. According to Reynolds (1998) in (Klein, 2000, p. 13), interdisciplinarity is best suited to problems of a multidisciplinary nature that cannot be addressed within the boundaries of one discipline.

A true interdisciplinary approach creates its own theoretical, conceptual and methodological identity. It utilizes a coherent and integrated approach to the problem. Klein (2000) explains that interdisciplinary traffic also occurs in common interests, shared facilities, instrumentation, databases, borrowed tools, methods, results, concepts and theories.

For Besselaar and Heimeriks (2001) transdisciplinarity is interdisciplinarity at its highest level because it requires a uniform, discipline-transcending terminology and methodology. It arrives at a homogenized theory or model. This is consistent with Klein (1986) who suggests that, there are several levels of interdisciplinarity but at its highest level, interdisciplinarity involves integration of concepts from various disciplines to arrive at a discipline-transcending terminology and

methodology. This synthesis requires an element of creativity, which utilizes knowledge from different disciplines.

The most common types of interdisciplinarity are multidisciplinary, pluridisciplinary and transdisciplinarity. According to Shailer (2005) "Multidisciplinary is a juxtaposition of various disciplines, sometimes with no apparent connection between them" (p. 2). Strathern (2004) explains that in multidisciplinary, skills from different disciplines are aligned. Klein (1990) describes it as additive not integrative. Pluridisciplinary is a juxtaposition of disciplines assumed to be more of less related, for example, mathematics and physics (Klein, 1990).

Transdisciplinarity is a process of establishing a common system of axioms for a set of disciplines" (Shailer 2005, p. 2). Klein (2005) explains that transdisciplinarity aims to create a comprehensive framework that transcends the narrow scope of disciplinary worldviews. Strathern (2004) explains that transdisciplinarity changes the process of knowledge production and in doing so makes better science. Leitch (2005) explains when this synthesis occurs, new theories are created. "It seems an era of interdisciplinarity, "Theory" is born out of this moment" (Chettiparumb, 2007 p. 14).

Because it is constantly evolving and able to adapt, authors such as (Besselaar & Heimeriks, 2001 and Klein, 1986) view transdisciplinarity as the highest form of interdisciplinarity.

Defining Disciplinarity

Disciplines are more easily defined than the concept of interdisciplinarity. While interdisciplinarity is new and difficult to define, disciplinarity has existed for centuries and has certain characteristics. Disciplines have social structures, practices and rules to which they adhere. They address only problems within their domain. They are made up of

individuals who have investments in maintaining the discipline's structures Weingart and Stehr (2000). Disciplines have questions, perspectives and methods, which help to identify them, (Salter & Hearn, 1996).

Disciplines shape our system of education. According to Weingart and Stehr (2000) "Disciplines are the intellectual structures in which the transfer of knowledge from one generation to the next is cast; that is, they shape the entire system of education." (p. introduction) Disciplines are important in universities, where the goal of knowledge is to understand. They do not generate the same respect in the real world, where knowledge is a means to an end.

Weingart and Stehr (2000) quote Webster's New World Dictionary, which defines discipline as "(1) 'a branch of knowledge or learning; (2) training that develops self-control, character, or orderliness and efficiency (4) acceptance of or submission to authority and control" (p. XX). According to Newell and Green (1982) "a discipline is perhaps best characterized as a socio-political organization which concentrates on a historically linked set of problems" (p. 25). Salter and Hearn (1996) point out each discipline has its own set of methods, perspectives, topics, agendas at conferences and journals.

Salter and Hearn (1996) differentiate between disciplines that are exclusive or tightly bound such as economics and those that are inclusive or loosely bound such as sociology. Exclusive disciplines are usually theory driven while inclusive ones more research oriented. According to Weingart and Stehr (2000), disciplines are not only intellectual but also social structures. The members' of these structures have invested a great deal of time and effort to identify themselves in such a way. Their reputations to a large extent rely on the discipline continuing in its existing form. For this reason, disciplines take on the political,

economic, legal, and ethical concerns necessary to ensure maintenance of the discipline in its current form.

Disciplines have a vested interest in maintaining the status quo, according to Turner (2000). Disciplines create a kind of internal market where students wanting to work in that specialization must become “consumers of what they produce” (Weingart & Stehr, 2000, p. 51).

Turner (2000) refers to disciplines as “cartels and monopolies where a clear career track from undergraduate major to professional appointment creates a self-perpetuating generational cycle” (p. 64). He suggests that when this dependent relationship is strong, disciplines are strong, but once the relationship is weakened, interdisciplinary flourishes.

Foucault (1977) relates the term discipline with the disciplining of knowledge in relation to power and control. Klein (1990) suggests that members of a discipline have the power to label work as good or bad. A discipline signifies a stable community that agrees on what constitutes excellence in a field. Disciplines have the power to determine who is admitted into their collectives and who is rejected. In this manner, they control or discipline their members and what is acceptable as knowledge within the discipline.

Much of the work of disciplines is about boundary setting and maintenance. Salter and Hearn (1996) trace the origins of disciplines to medieval universities where the study or theology became distinct from law and medicine. It is a term that continues to be used in universities. Klein (1990) suggests disciplines developed because industries demanded specialists.

According to Strathern (2004) “Disciplines are ways of keeping distinct the origins not just of ideas and materials, but of work practices, lines of authentication and accountability” (p. 45). According to Klein (1993)

who references Gieryn (1983), boundary work is partially about protection of autonomy over professional activities.

Disciplines may have arisen as the result of industries demand for specialists. However they have evolved into self-perpetuating entities where members have the power to determine who is permitted to belong and what type of work is acceptable. As a result members have a vested interest in maintaining boundaries.

Arguments For and Against Disciplines and Interdisciplinarity

Interdisciplinary and disciplinary approaches are in opposition to one another and proponents of each exhibit defensive postures in order to advocate for their position. In reality, both disciplinary and interdisciplinary approaches have issues and problems.

Disciplinarians use terms such as rigor, foundation and responsibility to defend their position and language such as pedagogically doubtful, shallow and sloppy to critique interdisciplinarity (Benson, 1982). Advocates of interdisciplinary use terms such as static and rigid to critique disciplinary and innovative and cutting edge to defend interdisciplinarity (Weingart & Stehr, 2000). Turner (2000) as referenced in Weingart and Stehr (2000) suggests that disciplinary loyalties undermine interdisciplinary work and that disciplines fear being subdivided and so assumes a defensive posture towards interdisciplinarity.

Although proponents of disciplines like to present a united front, such as Benson (1982) who suggests, “a discipline offers a general criteria for locating questions inside or outside its boundaries” (p.104), in reality, disciplines are subject to challenge both from within the disciplines and from outside. “Disciplinarity implies consensus about topics,

paradigms, or methods. But actual disciplines are characterized by conflict, not consensus, and by very differently oriented subfields" (Salter & Hearn 1996, p. 173). Proponents of disciplinarity like to present the notion of a hierarchy of knowledge, which exists only in the disciplines, Salter & Hearn (1996) suggest such a hierarchy is a myth.

Klein (1993) offers an explanation for the tension between disciplines and interdisciplinarity. She suggests that crossing boundaries is a usual characteristic of knowledge growth and that disciplinary boundaries are arbitrary and act as obstacles to cross-disciplinary inquiry. Perhaps some of these tensions are a result of the speedy pace of knowledge acquisition and change in a global society.

Disciplines and interdisciplinarity are at odds with one another. Proponents of each assume defensive postures towards the other. Disciplines set boundaries in order to protect their existing structure. Interdisciplinary challenges those boundaries in an attempt to create new knowledge. This makes proponents on disciplines uncomfortable.

Arguments in Favor of Disciplines

Disciplines identify themselves by the thoughts, methods and approaches they use. Boisot (1972) as cited in Chettiparumb (2007) suggests that disciplines arise from humanity's natural tendency to separate, classify and conceptualize all things (p. 2). A discipline has an epistemological approach to concepts, methods and ways of knowing. Klein (1990) explains, "The term disciplines signified the tools, methods, procedures, exempla, concepts, and theories that account coherently for a set of objects or subjects. Over time, they are shaped and reshaped by external contingencies and internal intellectual demands. In this matter, a discipline comes to organize and concentrate experience into a particular "world view." (p. 104)

Individuals working in disciplines have invested time and effort into becoming a part of that scholarly community. Similar to Foucault (1977), Parker (2002, p. 374) suggests that disciplines produce individuals who are ‘disciplined’ in a scholarly community (Chettiparumb, p. 3). Turner (2000) explains that disciplines have methods of hiring, tenuring, promoting, advising, granting degrees and placing students. He argues that a discipline exists only if it has a name, has actual facts of employment and people are trained in that discipline. According to Clark (1983, p. 26) disciplines determine what kind of knowledge they will invest in, “the ways in which educational groups are composed and controlled shape the ways in which knowledge is bundled” (Chettiparumb, p. 6).

Apostel (1972) as referenced in Chettiparumb (2007) suggests a discipline is made up of a group of persons, who take on specific work, form a community, create learning materials, and sustain the group through educational endeavors.

According to Brewer (1995) as cited in Chettiparumb (2007) a discipline has tradition of thinking that has been developed and tested over time. By thinking in the tradition required by the discipline, new theories and ideas can be tested. According to Finkenthal (2001, cited in Aram 2004, p. 380),

disciplines are involved in the development of concepts that are far removed from direct sensory experience. The concepts are discipline specific and provide what is commonly recognised as depth of inquiry for the investigation. It is the restriction of a discipline to a particular mode of inquiry that enables this. (Chettiparumb 2007, p. 8)

By accepting the tradition of thinking and examining new work against the thoroughness of the tradition, new knowledge is thought have undergone some sort or rigor and to have passed the test. Benson (1982) explains that disciplines, “are guided by broad, internal standards of relevance, whether that of the distinctive subject matter or of methods” (p. 104).

By identifying with a specific discipline, a scholar indicates they belong to a specific group and have undergone the rigorous training, which permits them to identify themselves as a member of that group. Huber (1992, p. 193) indicates, “a discipline also functions as a vehicle for the reproduction of social structures while in turn having its social structures reproduced by them” (Chettiparumb 2007, p. 5).

People within disciplines are trained in fundamentally the same way. Being trained in this way allows a graduate to identify themselves as members of a discipline. Turner (2000) indicates that a discipline has “actual facts of employment” that involve people trained in the discipline; and also the beginnings of a market for the employment of those trained in the discipline. (p. 46)

Arguments against Disciplines

Clark (1983) refers to a discipline as a ‘product line’ (p. 31). Clark (1983) explains that a discipline produces research that follows the same rules and procedures as all other research from that discipline; in this way it is a “product line” (Chettiparumb 2007, p. 6). Turner (2000) refers to this as a built in market. Huber (1992, p. 193) states, “a discipline also functions as a vehicle for the reproduction of social structures while in turn having its social structures reproduced by them” (Chettiparamb, p. 5).

Disciplines have clear boundaries, rules that indicate what type of research can be done, and who can do it. Interdisciplinarity is a threat to this kind of thinking because it does not have clear rules or clear boundaries. For this reason interdisciplinary is often discredited by disciplinarists. Turner (2000) explains that a discipline “is a kind of protectionist device” that has been successful in its adaptation (p. 50).

When change does occur within a discipline, it is often the result of new knowledge that has been developed and the requirement for new theories. As more scholars work in the area of the new knowledge, it either separates from the discipline or becomes some kind of hybrid. The hybrid zone is where the boundaries of two or more disciplines overlap. According to Dogan and Pahre (1990) innovation is most likely to occur in this hybrid zone (Chettiparumb, p. 7). Klein (1993) explains that it is in the permeation of disciplinary boundaries that new knowledge is most likely to be created.

By accepting the traditional mode of thinking and the rules that govern it, disciplines restrict the development of new knowledge. Griffith and Miller (1970) as referenced by Chettiparumb (2007) observe “the focusing of the group’s attention on a single series of phenomena and the development of a distinctive scientific style results in a considerable restriction of the range of information regarded as relevant” (quoted in Becher 1989, p. 46).

The restrictions of disciplines permit any new knowledge from being developing and in doing so focus inward on the same problems in the same ways. Strathern (2004) suggests that disciplines “need collaborators, audiences, co-disciplines: like spouses in search of partners, who produce unique children that match neither parent but become their own source of vitality” (p. 46).

Members of a discipline are so entrenched in its ways of thinking that they may lose their ability to consider other solutions. This socialization results in a kind of inbreeding that produces offspring or ideas that are not as healthy as they might be with some new input. According to Salter and Hearn (1996) “Disciplinarity prevents the true evolution and politicization of knowledge; it is the product of the power of those who would like to maintain the social order as it is” (p. 34).

The problems of the real world do not lend themselves to being addressed by a tradition, which prevents solutions, which do not meet a set of established rules. To illustrate this, the OECD (1982) as referenced in (Chettiparumb 2007, p. 9) went so far as to title a chapter in a report in a “Communities Have Problems, Universities Have Departments.”

By rejecting solutions that do not fit within an established set of rules, disciplines prevent new knowledge from being developed. The OECD (1982) suggested that disciplines have a tendency to lose sight of the amount of knowledge not accessible to them by the very limitation of its boundaries (Chettiparumb, 2007, p. 9).

Proponents of interdisciplinarity suggest “Disciplinarity prevents the true evolution and politicization of knowledge; it is the product of the power of those who would like to maintain the social order as it is” (Salter & Hearn, 1996, p. 34).

By examining the same knowledge over and over, few new insights develop. Klein (1993) explains that most new knowledge in disciplines comes from cross-referencing ideas from other disciplines and not from research that is narrowly focused within a discipline.

While disciplinarists would argue that they are experts in their discipline, Klein (1993) suggests unidisciplinary competence is a myth. The volume of information within a discipline is larger than that which any individual can master. She explains further, that the idea of a discipline is no longer a reality in undergraduate departments and that each department relies on a variety of disciplines to deliver its courses.

Those who dare to question the tradition of thinking within a discipline may be subject to punishment in the form of resistance, rejection or expulsion. Becher (1989, p. 37) as referenced in Chettiparumb (2007,

p. 10) states, “Any systematic questioning of the accepted disciplinary ideology will be seen as heresy and may be punished by expulsion.”

In the case of the social sciences, some disciplines group together with sub disciplines in order to create a stronger core. Klein (2000, p. 8) argues, “The space of interdisciplinarity is not just out there – interdisciplinarity activity these days may be in the heart of disciplinary practice” (Chettiparumb 2007 p. 15).

Arguments in Favor in Interdisciplinarity

According to Newell (1983), it is in its problem-solving conception that interdisciplinary studies is at its most useful. The purpose of interdisciplinary studies is to address a question that is too broad to be answered by a single discipline. Relevant disciplines with their concepts, theories and methods each contribute to a solution to the problem or questions. Interdisciplinary is seen as a method with which to address real problems.

An interdisciplinary approach often allows for a synthesis of ideas, which permit a problem to be seen in a larger context. Newell (1983) suggests the role of the interdisciplinarian is to illuminate and evaluate disciplinary insights and determine how they can contribute to a solution. It is in this illumination and evaluation that higher-level thinking skills are required, thereby attesting to the true intellectual rigor of interdisciplinary studies.

According to Gabelnick (2002, pp. 288-289) interdisciplinary learning differs from disciplinary learning in that it is more likely to be self-directed, creative and expressive. It allows for mistakes, provides on-line or on the job learning, is reflexive and concerned with the learning process (as referenced in Chettiparumb p. 33).

A disciplinary approach to a problem may result in the problem being framed in terms of the epistemology of the discipline. With an interdisciplinary approach, this is not likely to happen. A problem solving committee made up of members of several disciplines is less likely to allow one of its members to dictate a solution and more likely to draw strengths from the approaches of each of the members. Newell (1983) explains that interdisciplinary study involves questions, which transcend any one discipline. A method for combining these disciplinary insights cannot be defined because it is different depending on the problem.

Nissani (1997, p. 201) explains that interdisciplinarity encourages creativity and allows for the flexibility that bridges the gaps in modern academe, thereby mobilizing greater resources towards social rationality and justice. He states that disciplines often commit errors, which can best be identified by those from outside of the discipline (Chettiparumb 2007, p. 16).

Kavoloski as referenced in Newell and Green (1982) states that interdisciplinary education requires “the integration of knowledge” – the awareness of the interconnectedness of the world, the ability to see the larger context; “freedom of inquiry”-the opportunity to follow an issue without regard to artificial disciplinary barriers; and “innovation”-the chance for unconventional thinking and original insights” (p. 32).

Newell (1983) suggests that disciplinary studies benefit from interdisciplinary approaches to make learning come alive. Without an interdisciplinary approach, disciplinary studies do not connect meaningfully to the real world, thereby limiting any real learning from occurring. (Klein 2000, p. 18) indicates, “Interdisciplinary knowledge strengthens connections between disciplines and in that process it weakens the division of labour in disciplines, exposes gaps, stimulates, cross-fertilization and creates new field of focus for knowledge inquiry” (Chettiparumb 2007, p. 16).

Rhoten (2004) argues that graduate studies in interdisciplinarity produce broader problem-solving skills that require learning, unlearning and relating across disciplines.

Newell (1983) explains, employers are interested in graduates who have developed the higher order thinking skills including group participation, ethical sensitivity and constructive response to criticism, required in interdisciplinary courses. Newell (1983) agrees with Benson (1982) there are times in interdisciplinary courses when synthesis does not occur, but he suggests that is also true for disciplinary courses. Instead, interdisciplinary courses recognize that some problems cannot be summarized by a gathering of insights from disciplines and that the solutions are often more complex and not always attainable.

Newell (1983) suggests that in time, larger interdisciplinary classes will eventually become the norm and that team teaching may be replaced by team curriculum development. The issue here is not whether this is more expensive, but the purpose of the course. If the purpose is to actually affect some type of learning, than most academics would agree, this occurs best in smaller groups where students have the opportunity to participate.

Arguments against Interdisciplinarity

In 1982, Benson published “Five arguments Against Interdisciplinary Studies.” In this paper, he outlines many of the strongest critiques of interdisciplinarity. He suggests that interdisciplinary studies rests upon serious conceptual confusion, is a pedagogical doubtful business, should not be undertaken without a solid disciplinary background and that courses are shallow and expensive.

According to Benson (1982), interdisciplinarity studies “lack a coherent, defensible sense of purposes” (p. 103). He suggests that because the

principals of interdisciplinarity are never stated, it amounts to borrowing insights and methods from one or more disciplines.

According to Klein (2005), the problems with interdisciplinarity include a failure to check on the accuracy and validity of materials and ideas being borrowed and partial use of methods from other disciplines. Klein (1990) explains the borrower must assume responsibility for comprehension of ideas and methods being borrowed.

Benson (1982) argues that it is not useful to engage in interdisciplinary studies without first having a background in a discipline. He states, "If integrative studies are to be pursued properly and have lasting value, the student must first acquire a strong foundation in at least one of the contributing disciplines" (p. 105).

Benson (1982) suggests graduate programs will not look favorably upon applicants without a solid disciplinary base. Benson (1982) states that, "For most students, however, the price of concentration in integrative studies, with the attending neglect of a disciplinary base, will be the risk of disqualification from coveted graduate school and job opportunities" (p. 107).

Benson (1982) suggests that interdisciplinary courses are often created around issues of popular interest with little concern for critical thinking or a systemic grasp of issues. He offers that, "Instead of a carefully planned, intellectually demanding mix of lectures, sharply focused discussions, exams, and papers, the student is exposed to a semester long variety show, doubtless interesting, but of very little long term educational value" (p. 107). According to Salter and Hearn (1996) this viewpoint of interdisciplinarity as an extension of the disciplines results in interdisciplinarity receiving a marginal status.

Benson (1982) suggests that because interdisciplinary courses often rely on team teaching, special events, independent study and low faculty-student ratios they are extravagant and not cost effective. He states that, “interdisciplinary studies programs place further burdens on severely limited academic budgets” (p. 108). Klein (1993) suggests that the reality is, undergraduate programs already rely on other disciplines within the university to deliver courses within their program.

In his response to these arguments, Newell (1983) adequately debunks many of Benson’s (1982) arguments. He does however; agree that until interdisciplinarity comes to some agreement about the concept of interdisciplinarity, it will continue to be attacked by higher education.

In this age of interdisciplinary, Benson’s arguments against interdisciplinarity seem outdated. While it is understandable that disciplinarists would want to protect their investment in a discipline, interdisciplinarity is creating excitement in both the academic world and in industry. As the world becomes increasingly complex solutions cannot be found within a single discipline. Debating disciplinarily versus interdisciplinarity is futile, as each have their place.

Challenges Facing Interdisciplinarity

Interdisciplinarity relies on a number of factors working together in order to be successful. Just because several disciplines come to the table to work on a problem, does not mean interdisciplinarity has occurred. In order for interdisciplinarity to succeed researchers must work together, exchange information, teach, and learn from each other.

Salter and Hearn (1996) suggest that interdisciplinarity research fails for a variety of reasons, not all of them having to do with their interdisciplinarity nature. As with any research group, the team may fall apart. Interdisciplinary teams may become preoccupied with

interdisciplinary problems, unable to reach synthesis or they may produce a product that fails to find an audience because of its interdisciplinary nature.

One is the greatest problems with teaching interdisciplinarity is determining how to assess it. Field and Stowe (2002) suggest that assessment must be used to improve teaching and learning, should be developed locally, involve teaching staff and be open to continuous improvement (Chettiparumb, 2007 p. 35).

Newell (1983) suggests that interdisciplinary studies need to set standards of excellence and train faculty in interdisciplinarity. In addition, there must be agreement on what it means to teach interdisciplinarity well. More effort needs to be directed towards determining what model works for delivering interdisciplinary courses and what sequences are the most beneficial for combining disciplinary concepts with interdisciplinary ones.

Salter and Hearn (1996) state that interdisciplinarity is currently receiving attention from funding agencies, “University administrators, granting councils, and governments’ now lay great stock in interdisciplinarity, which is seen to be synonymous with practicality and relevance in research” (p. 171). As interdisciplinary research attracts attention from industry it becomes vulnerable to corporate interests.

Strathern (2004) cautions that in an era where interdisciplinary studies is receiving funding from industry it must be cautions about who the knowledge created, belongs to. She states “A climate of heightened consciousness over ownership of rights in intellectual outputs-in which academics are urged to acknowledge links to industry – raises obvious questions about who the appropriate holder of rights is” (pp. 57-58).

According to Rhoten (2004) interdisciplinary research suffers from systemic implementation problems. It does not receive enough support from university management structures. She suggests universities treat interdisciplinarity as a trend and not a real transition towards reconceptualization of new research. Universities adopt interdisciplinary labels, but do little to change the structures of disciplines to make them interdisciplinary in nature. She suggests that in order to succeed, interdisciplinary research requires funding, an independent location and clear well-articulated problems, product or projects.

Interdisciplinary faces many challenges. As there is no one way to do interdisciplinarity, it is difficult to determine when good work is being done or to teach how to do it. While interdisciplinary work is currently receiving attention and funding from both universities and industry, it must remain cautious regarding the ownership of knowledge generated. If interdisciplinarity is to thrive, it must receive support from the universities that adopt the label.

The Future of Interdisciplinarity

There is great hope that through interdisciplinarity disciplinary boundaries can be dissolved to create knowledge that will benefit society. There is no one-way to do interdisciplinarity and as a result, it will remain progressive and unorthodox.

Interdisciplinary researchers suggest that disciplines are the way of the past and interdisciplinarity is the way of the future “the existing matrix of disciplines is dissolving, leading to fundamental changes in the order of knowledge” (Weingart & Stehr, 2000, Introduction). “Others believe interdisciplinary is the next phase in the development of the social sciences, that increasing acceptance of interdisciplinary study marks a “paradigm shift” under way in academe” (Klein, 1990, p. 53).

Clearly not an academic fad, Klein suggests that (2005) interdisciplinarity is not simply one more item on the list; it interacts with every trend line. It brings with it a hope and optimism for rejuvenation and regeneration, pressures for change, and the capacity for responsiveness to the issues facing society. Salter and Hearn (1996) suggest that through interdisciplinarity, the best efforts of researchers to focus on societal issues and to explore the social and practical applications of their expertise are brought together. Strathern (2004) proposes it is this responsiveness that makes interdisciplinarity inherently accountable. She views interdisciplinarity as a way for science and society to work together.

According to Salter and Hearn (1996) if interdisciplinarity were to become more discipline like, it would lose its flexibility. Klein proposes a type of multimodality or several different modes of inquiry (Salter & Hearn, 1996). Yet, interdisciplinarity is always changing and evolving. Bechtal as referenced by (Klein in Weingart & Stehr, 2000) defines interdisciplinarity as an ‘ongoing process for discovery,’ not an attempt to systemize what is known (Klein, 1986, pp. 43-4).

Interdisciplinarity has replaced the attempt to find one overarching theory that can be applied to all things. Klein (2000) explains, “The idea of interdisciplinarity as the mode of innovation and progress has taken the place of the promise of the unity of science, (Weingart & Stehr, 2000, p. 41.)

In recent years, there has been a tendency for award granting bodies to favor interdisciplinary projects (Weingart & Stehr, 2000). This competition for funding is harmful to interdisciplinary research and is often referred to as academic wars. Klein (1990) suggests that there should not be direct competition for the same fund between disciplinary and interdisciplinary research. According to Salter and Hearn (1996) if interdisciplinarity is to thrive, opportunities must be created for regular

and sustained contact between and among disciplinary communities and disciplinary barriers need to be broken down-granting councils need to encourage disciplines to work together.

Klein (1990) suggests that interdisciplinary programs are limited by a lack of a long-standing tradition, the power of disciplinary and departmental boundaries of conditions outside of the university (p. 179). However, Klein (1990) suggests that sharing the work being done in interdisciplinary field is one of the most urgent needs in current scholarship (p. 111).

Classroom management has traditional been viewed as an educational problem. When it is viewed as an interdisciplinary problem it becomes clear why it is so difficult to master.

Classroom Management as an Interdisciplinary Problem

Classroom management refers to a complex combination of teacher actions and student reactions, which encourage respect and create an environment where learning can occur (Burden, 2006). Much has been written about the difficulty of mastering classroom management and how to do it. Many of these approaches consist of scholars and or experienced teachers sharing their research and observations with student teachers. Such research attempts to discover the behaviors, skills, patterns, and strategies that lead to improved student learning.

These approaches under represent the complex nature of classroom management. Clark (1988) suggests that teacher education programs may control, oversimplify and distort practice teaching and field observation experiences by relying on the process-product tradition of research. Jackson (1990) described classroom life as “too complex to be viewed or talked about from any single perspective” (p. xxi). He goes on to explain that, “The complexity of the teacher’s work

extends beyond the fact that he is concerned with a complex organism, working towards complex goals, in a complex setting. He is also in most instances is working with a *group* of students” (p. 161). Jones (2000) states that classroom management is more complex than child rearing, “We are attempting to rear a room full of other people’s children, simultaneously teaching them academic skills and the basics of civilization” (p. 160). Referring to many attempts to simplify classroom management, he adds, “ Yet, people keep looking for the answer in a “one-liner” (p. 160).

Each child brings to the classroom a level of readiness to learn. The factors related to a child’s readiness to learn are multi-faceted but include the socio-economic status of the child’s environment, the cultural background of the child, the parent’s ability to nurture and stimulate the child, the mother’s health during and after pregnancy (alcohol consumption, depression, and smoking) and the political environment in which the child is attending school (Keating, 1999; Bigelow, 2006).

Classroom management is a complex problem that cannot be viewed from an educational perspective alone. Consistent with Bronfenbrenner’s Ecological Systems Model (1979) several disciplines affect classroom management including education, pedagogy, andragogy, psychology, sociology, history, political science, economics and Indigenous Studies.

Current research indicates that student teachers have well formulated beliefs about teaching and learning prior to beginning their teacher training (Clark, 1988; Richardson, 1996; Leavy, McSorley & Bote, 2007). Much of a teacher’s classroom management style will be grounded in his or her beliefs about children and learning. These beliefs may mature through reflection (Dobbins, 1996). Associate teachers also play a significant role in student teacher development

(MacKinnon, 1989) and faculty and or university supervisors are especially important in a student teachers early development (Jones & Vesiland, 1996; Richardson-Koehler; 1988).

What has not been examined is the impact children and youth in the classroom may have on the development of classroom management for the student teacher. We know that children and youth in the classroom do not only react to their teacher's actions but possess agency (James & Prout 2005; Solberg, 2005; Crass, 1998; Davis, 1990).

Several authors including (Leavy, McSorley & Bote, 2007; Crass, 1998; Zeichner & Liston, 1996; Jones & Vesiland; 1996) suggest that children and youth in the classroom may influence student teacher development. Leavy, McSorley and Bote (2007) report there is a growing awareness of the central role of the child in the classroom. Jones & Vesiland (1996) found that experiences with students were essential in transforming prior beliefs. Zeichner and Liston, (1996) encourage listening to children and youth as a way to improve teaching, consistently Crass (1998) reported learning much about teaching from her own students.

Teaching and learning as a very complex reciprocal relationship between the student and the teacher. Smyth (2005) explains that in order to do his or her job well, a teacher must be willing to learn from the students. According to Montuori (2005a) as referenced in Morin (2008) "and a key dimension of transdisciplinarity is understanding the way knowledge is constructed in various disciplines and approaches."

One of the reasons classroom management is the most challenging area for student teachers to master is because it requires a transdisciplinary approach which includes a synthesis of all of the factors impacting on classroom management. These factors must synthesize to create an approach that works with that classroom, at that time. That same approach may not work with another classroom; it may not even

work in a month because classroom management is a moving object that is constantly changing. Clark (1988) estimates that teachers are required to make decisions every two minutes while teaching. They must continually adapt based on student's reactions.

Knowledge of classroom management is static. We have been teaching student teachers the same methods and techniques for many years (Clark 1988). As the classroom becomes more complex, with a large variety of readiness abilities, and a focus on differentiated learning and teaching, the methods that once worked do not work as well. Strathern (2004) explains that when knowledge is static, it becomes cold. This occurs when disciplines, such as education in this case, focus inward. When knowledge is used to respond to a crisis, such as the changing nature of the classroom, it becomes hot. This state of change or flux produces new knowledge.

Consistent with Strathern (2004) classroom management is a continuously evolving problem that oscillates from a Mode 1 or static to a Mode 2 or state of flux. In reality, the dynamics of the classroom are constantly changing. These dynamics are impacted by such factors as the level of readiness of the students in the classroom, the transient nature of classroom makeup, cultural differences, and changes in political or economic agendas as well as the teacher's ability to deal with stress. In this way classroom management is an, 'ongoing process for discovery', which involves 'knowledge negotiation and new meaning as described by (Klein, in Weingart & Stehr, 2000, p. 21).

When classroom management is in Mode 1, it is stable but no new knowledge is created. As a result, of the many factors impacting classroom management, Mode 1 cannot exist for long before a new problem requires innovation or new knowledge and Mode 2 is entered into. In this way, classroom management is a type of knowledge that

fluctuates between the static Mode 1 and the state of flux of Mode 2.

When classroom management is approached as a transdisciplinary problem, which requires a synthesis of many different kinds of knowledge it becomes clear why classroom management is the number one problem of new teachers. Joram and Gabriele (1998) reported that classroom management is the main concern of student teachers and a challenge for many beginning teachers. Similarly, other researchers (Housego, 1990; Veenman, 1984) have regarded it as the most difficult aspect of teaching to master.

Classroom management is an interdisciplinary problem that is transdisciplinary in nature because it requires, “a different way of thinking, and a different way of organizing knowledge” (Morin, 2008, p. xx1). If we continue to examine it as a pedagogical issue, the results will be more process-product research (Clark, 1983). Morin (2008) implores us to not remove ourselves from the analysis of problems. He challenges us to consider a way of thinking that does not mutilate life, but allows us to live it more fully, to be more present to the complexities, paradoxes, tragedies, joys, failures, and successes. To separate classroom management from the individuals who make up the classroom, children and youth and educators, is to mutilate the problem.

From an educational perspective classroom management is one of the most difficult aspects of teaching to master. From an interdisciplinary perspective, classroom management is a complex problem that requires student teachers to know the children in their classroom and adapt their classroom management style to incorporate the children and youth in their classroom. Only then can classroom management be mastered.

Conclusion

Disciplines have a set of problems, methods and techniques. Interdisciplinarity does not have a set of problems, methods or techniques. Instead, it pulls from appropriate disciplines to address a problem. Interdisciplinarity requires individuals to share knowledge, learn and create new knowledge. Interdisciplinarity is focused on real world problems.

Classroom management is an example of a problem that has traditionally been viewed from the discipline of education. Such an approach fails to recognize the complexities of classroom management. An interdisciplinary approach does not remove the teacher and students from the problem. Instead, it acknowledges that the teacher will have a preferred classroom management style and that students will demonstrate agency by reacting to those efforts. It is only when classroom management is viewed from an interdisciplinary lens that incorporates an understanding of the complexities of the classroom, that it can be truly mastered.

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