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Interdisciplinary and Intradisciplinary Research and Teaching in Kinesiology: Continuing the Conversation

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Interdisciplinary and Intradisciplinary Research and Teaching in Kinesiology: Continuing the Conversation

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Interdisciplinary work is increasingly becoming a larger expectation in research and teaching. Moreover, prominent kinesiologists have proposed interdisciplinary research as a solution to perceived and/or real fragmentation issues that have developed within the field and across, and even within the various subdisciplines. For such an important topic, however, there is a lack of research surrounding interdisciplinary research in kinesiology. This may be due to the ambiguity surrounding interdisciplinary research, an often misunderstood and misapplied concept with deep philosophical roots. The purpose of this article is to help those in kinesiology understand and use interdisciplinary concepts in their work. Toward this end, the article provides an overview of the literature and suggests kinesiology-specific definitions for interdisciplinary and intradisciplinary research. Additionally, the article gives examples of interdisciplinary research projects. Finally, the article will expand beyond scholarship and explore the importance of interdisciplinary teaching and service as well.

Keywords  Collaboration, exercise science, multidisciplinary, transdisciplinary

Introduction

Interdisciplinary research (IDR) is becoming ubiquitous in higher education as expectations for collaboration rapidly increase in research, teaching, and funding (Basken, 2012a, 2012b; Byrne, 2014; Jacobs, 2009; Ruse, 2010). Within kinesiology, however, the scholarly discussion of IDR has been limited. That said, prominent scholars have discussed IDR as a viable solution to the field’s half-century long struggle with vertical subdisciplinary specialization (i.e., the development of silos) that has resulted in disciplinary fragmentation (Hoffman, 1985; Kretchmar, 2005; Newell, 1990, 2007; Rikli, 2006). Newell (1990) posited that IDR may help close the chasms and integrate the field. Park (1998) also argued that kinesiology should focus its collective strengths and devote more time to fostering research that can benefit the entire field, not just one component. Yet, for such a critical and much discussed topic, little research has been done to truly advance or evaluate solutions (Park, 2011). For example, within the field of kinesiology, it is currently unknown how much IDR is being produced, who is producing IDR, and the challenges or barriers relating to IDR.

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There has also been little attempt to define or operationalize IDR specifically for kinesiology. Gregor (2008) and Weiss (2008) suggested that a lack of communication between researchers both within and between subdisciplines is hindering IDR in kinesiology. This lack of communication has allowed vague notions of IDR to flourish, forcing researchers, administrators, and funders to decide what IDR should look like for kinesiology. Autonomy in higher education is good, but without any guidelines or even active discussion, one is left with more confusion than clarity.

The lack of IDR dialogue is, at the very least, partially due to a lack of understanding about IDR’s interconnected components. Naivety is understandable because currently there is no agreed upon definition or application for IDR in any discipline. Instead, there are numerous (and often competing) classification systems (Frodeman, 2014; Klein, 1990; Lattuca, 2001; Moran, 2010). Higher education lacks consensus because IDR is fundamentally philosophical and not typically based on real-world observations (Lattuca, 2001). Kinesiologists and administrators must then borrow IDR definitions and applications from other disciplines or organizations, which may not meet the needs of the diverse and changing field. Adopting other fields’ views of IDR could change the scope and expectation within kinesiology. To avoid this, a kinesiology-specific definition of IDR must be advanced.

The purpose of this article is to help those in kinesiology understand and use interdisciplinary concepts in their work. The authors begin by formally proposing a kinesiology-specific definition of IDR. Next, they differentiate between intradisciplinary research (ITR) and IDR within kinesiology and provide working definitions of each. Examples of kinesiology ITR and IDR collaborations are then showcased to help contextualize and further operationalize this work. Finally, they explore ways of expanding ITR and IDR principles beyond scholarship and into the areas of teaching and service within higher education. Their hope is that this will spark disciplinary discourse on these topics, helping to move ITR and IDR from abstract notions toward concrete guidance.

**A Definition of IDR**

Due to the rise in popularity of IDR, there has been a proliferation of IDR definitions. The National Academies Committee on Facilitating Interdisciplinary Research (2005) definition is perhaps the most frequently used within the sciences. The Committee defined IDR as a

Mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice. (p. 188)

The Committee’s definition was part of a larger report that provided a thorough review of current definitions, strengths, and challenges of IDR. The authors concluded that IDR is an integral part of research and academic training. While there are challenges, the Committee felt IDR was beneficial for students, faculty, and the greater research community (e.g., funders, government agencies). Prior to publication, the report was reviewed by a panel of experts and has since been adopted by the National Science Foundation (NSF).

In addition, the National Institutes of Health (NIH) recognized the importance of IDR in advancing knowledge, making it a priority in its recent Roadmap, a strategic plan for
future NIH funding (NIH, 2014). In doing so, the NIH acknowledged that many scientific questions cannot be answered by a single discipline, thus a goal of the NIH’s IDR program is to shift the academic culture toward interdisciplinary approaches comprised of diverse scientific teams (NIH, 2014). However, the NIH requirements have been vague, requiring clarifying statements on the Request for Applications (Huerta et al., 2005). Regardless, the NIH’s support and the associated grant money available for IDR has helped to elevate IDR as a necessity in scientific research (Freeman, 2012; Giacobbi, Buman, Romney, Klatt, & Stoddard, 2012).

As an academic discipline, kinesiology is unique because its subdisciplines are so diverse, including the biophysical (e.g., physiology, biomechanics), behavioral (e.g., psychology, motor learning), and sociocultural (e.g., philosophy, sociology). In addition, others have recognized the existence of additional specialized subdisciplinary areas that already span between the three major classifications (e.g., kinesometrics [Zhu, 2010], pedagogy [Freeman, 2012], physical activity epidemiology [Dishman, Heath, & Lee, 2010], and sport management and administration [Zeigler, 2003]).

It is important to note that kinesiology’s diversity has led to some confusion. For example, within the literature, many scholars refer to the profession of kinesiology as being different from the discipline of kinesiology. Corbin (1993) defined the discipline as the study and production of the body of knowledge, whereas the profession refers to the application of knowledge (e.g., practitioners, programs, clients, methods). However, both the discipline and the profession fall under the general field of kinesiology (Corbin, 1993). A field is the combination of “disciplinarians and professionals each fulfilling different important roles while working toward common goals” (Corbin, 1993, p. 88). Regardless of the categorization, everyone associated with the field of kinesiology should be working toward the common goal of understanding and promoting physical activity. IDR can help with this goal. At present, however, the authors are not aware of any specific definition of IDR within kinesiology. Kinesiology warrants a definition that addresses its naturally diverse structure.

The closest definition for kinesiology to date was proposed by Aboelela and colleagues (2007). They conducted interviews with 14 experienced IDR scholars from the fields of health and social science to arrive at their definition. In addition, Aboelela and her colleagues conducted a systematic review of IDR research and definitions from education, business, and healthcare from 1980 through 2005. The following definition was the result of their work:

Interdisciplinary research is any study or group of studies undertaken by scholars from two or more distinct scientific disciplines. The research is based upon a conceptual model that links or integrates theoretical frameworks from those disciplines, uses study design and methodology that is not limited to any one field, and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process. (Aboelela et al., 2007, p. 341)

Aboelela and colleagues’ (2007) definition is relevant because the field of kinesiology shares attributes with the fields of education, business, and healthcare. However, the definition is not fully satisfactory because it does not address all the unique needs of kinesiology researchers and practitioners. Next, the authors critically review their definition and offer recommended changes in an attempt to arrive at a more comprehensive and applicable definition of IDR for the field of kinesiology.
According to Aboelela and colleagues (2007), “Interdisciplinary research is any study or group of studies undertaken by scholars from two or more distinct scientific disciplines” (p. 341). This opening sentence of their definition has two major limitations for kinesiology. First, the authors unintentionally limit IDR to only “scientific” disciplines, reinforcing a bias against the humanities and sociocultural disciplines (e.g., history, philosophy). For kinesiology, this limitation is troublesome because these subdisciplines are an essential part of the field. A more appropriate wording would replace “scientific” with the more inclusive “academic.” Second, unlike the Committee on Facilitating Interdisciplinary Research’s (2005) definition, Aboelela and colleagues (2007) failed to acknowledge an individual’s ability to conduct IDR. Instead, multiple scholars, as well as multiple disciplines, are prerequisite. IDR, however, is about synthesizing knowledge and should not be defined merely by the size of the research team. Interdisciplinary projects should require knowledge in each discipline but not necessarily an individual scholar from each discipline. For example, a single physical education researcher could examine the effectiveness of a new curriculum by combining the disciplines of education, psychology, leadership, and sociology. Thus, the authors propose the following modification to this sentence: Interdisciplinary research is any study or group of studies from two or more distinct academic disciplines.

Aboelela and colleagues (2007) continued, “The research is based upon a conceptual model that links or integrates theoretical frameworks from those disciplines” (p. 341). The beginning of the second sentence makes a positivistic assumption about IDR, specifically that it must have a conceptual model and theoretical framework. While theory should never be disregarded, this assumption is problematic for kinesiology because it eliminates studies that might combine concepts/models or use qualitative research methods that do not draw from a particular theoretical framework. For example, an epidemiological study on children’s physical activity levels might rely on historical trends, societal norms, and cultural practices to interpret the results and make recommendations. While such a study might create a conceptual model by drawing from history and sociology, it is not necessarily creating or testing a specific theoretical model. The same might also be said about some forms of qualitative research (e.g., ethnography, field research, grounded theory, phenomenology). Thus, the authors propose the following modification to this sentence: The research is a synthesis (or derivative) of concepts, models, and/or theoretical frameworks from those disciplines...

Aboelela and colleagues (2007) concluded, “uses study design and methodology that is not limited to any one field, and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process” (p. 341). The end of the definition is critical to successfully completing IDR. By requiring all involved disciplines to be used multiple times throughout the research process, it minimizes the overemphasis of any one discipline. For such a critical point, however, the phrase “multiple phases of the research process” is too vague, leaving the interpretation to each individual researcher. A small clarification can help standardize the definition, providing a more effective guide, especially among IDR newcomers. The current authors suggest the following wording: uses study design and methodology that is not limited to any one discipline, and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process (i.e., review, research, analysis, and interpretation of the results).

Finally, throughout the entire definition, “field” is used synonymously with “discipline,” which is problematic, especially in kinesiology (as noted above; Corbin, 1993). The authors recommend using “discipline,” since it is associated with the research side of the “field” (Corbin, 1993). As a result, the authors recommend the following as a working definition for IDR in kinesiology:
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IDR is any study or group of studies from two or more distinct academic disciplines. The research is a synthesis (or derivative) of concepts, models, and/or theoretical frameworks from those disciplines, uses study design and methodology that is not limited to any one discipline, and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process (i.e., research, analysis, and interpretation of the results).

A Definition of ITR

Reeve (2007) suggested that research amongst kinesiologists be considered ITR, emphasizing the relatedness of the subdisciplines’ research focus: human movement. Unfortunately, ITR has not been mentioned elsewhere in the literature. The authors feel there could be many possibilities for this void in the literature, but they will only explore the two extremes. First, ITR may not be considered “true” collaboration because researchers are still within kinesiology. Therefore, a synthesis of ideas may be present in the research, but it is underemphasized because of the relatedness of the researchers’ focus.

On the other extreme, researchers conducting ITR really believe that it is IDR. While the distinction may seem trivial, summarily dismissing it would be troubling because it alludes to a larger problem that plagues kinesiology: researchers from a kinesiology subdiscipline having a stronger allegiance to a “parent discipline” (e.g., biology, physiology, psychology, sociology) instead of kinesiology. Thus, an exercise physiologist and exercise psychologist feel that their research scope is fundamentally different from one another, even though they may be housed in the same department. The researchers do not feel that they are studying the same thing; they are speaking different languages (Tinning, 2013). This results in research being done in isolation, which has led to the development of separate bodies of literature, and sometimes to opposing views and results on the same subject matter (Tinning, 2013). Part of this problem may be affiliation with another area of academia, such as a subdiscipline’s “parent discipline.” It may be beneficial to take ownership of subdisciplines since all areas of kinesiology are interconnected. Regardless, the discipline will only benefit by distinguishing between ITR and IDR. To help differentiate between the two, a separate (albeit parallel) definition is needed for ITR. The authors suggest the following:

Intradisciplinary research is any study or group of studies from two or more distinct subdisciplines within the same parent discipline. The research is a synthesis (or derivative) of concepts, models, and/or theoretical frameworks from those subdisciplines, uses study design and methodology that is not limited to any one subdiscipline, and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process (i.e., research, analysis, and interpretation of the results).

There are unfortunate logistical complications that can make differentiating between ITR and IDR problematic. For example, kinesiology subdisciplines may not always be located within the same department or college (e.g., at the University of South Carolina, the Department of Physical Education and Athletic Training is housed within the College of Education; the Department of Exercise Science is housed within the Arnold School of Public Health; and the Department of Sport and Entertainment Management is housed within the College of Hospitality, Retail, and Sport Management. By contrast, at the University of Georgia, Athletic Training, Exercise Science, Physical Education, and Sport Management are all program areas housed in a Department of Kinesiology within a College
of Education). Department and program names also widely vary, making definitions hard to follow (Bird, 1988; Brassie & Razor, 1989; Čustonja, Milanović, & Sporiš, 2009; Vincent, Winningham, & Caldwell, 1988). Finally, conducting research with community groups or organizations outside the academy (be they kinesiology-related or not) is often missing in IDR and ITR discussions. By taking time to think about what kind of research they are conducting, kinesiologists (and all researchers) will help to clarify the muddy waters in which IDR and ITR currently exist. Over time and as examples begin to accumulate, the distinctions should become increasingly clear.

An IDR Continuum

Current working definitions of IDR (including the suggested definitions for both IDR and ITR in kinesiology that are proposed above) do not demark the degree of interdisciplinarity. Not all ITR or IDR research is the same, and certain research questions require different degrees of collaboration. Labeling all types of collaborative projects as IDR without recognizing their degree of interdisciplinarity reinforces IDR’s opaque nature. Lattuca (2001) helped clarify this problem by interviewing 38 faculty members who displayed IDR research and teaching characteristics. Lattuca asked the participants to describe their own accounts of IDR and teaching. Emerging from the plethora of information obtained was a four-category IDR typology (Lattuca, 2001):

- Informed Disciplinarity: The research question is discipline-based, but may be supplemented and informed by concepts or theories from a different discipline. Example: Researcher(s) measure societal or environmental barriers to help understand individuals’ motivation to be physically active. While it draws from outside the discipline, the borrowed tools are only being used in the context of psychology.

- Synthetic Interdisciplinarity: The research question links disciplines together with little to no synthesis. Example: Researcher(s) separately measure(s) societal barriers and physical environment to understand individuals’ motivation to participate in physical activity. This moves up the IDR continuum, connecting together theories and conceptual models from multiple disciplines, but without any effort to synthesize the two.

- Transdisciplinarity: Research question applies multiple theories, concepts, or methods across disciplines with the intent of developing an overarching synthesis. Example: The researcher(s) strive to combine societal, environmental, and cognitive factors together, like social capital, neighborhood walkability, and motivation, to form a new single social-psychological framework to examine individuals’ participation in physical activity.

- Conceptual Disciplinarity: A research question without any disciplinary basis (i.e., “discipline-less”). It resembles grounded theory (Glaser & Strauss, 1967), where research is approached without any predetermined lens or theoretical basis. Yet, this type of research often implies a critique of disciplinary contributions, as most scholars employ a postmodernist, feminist, and/or cultural studies approach (Lattuca, 2001). Example: Researcher(s) approach the question of individuals’ participation in physical activity without any disciplinary theory or method and strive to create something new based off of observation and/or experimentation.

The typologies are not hierarchical but degrees of a continuum, from less interdisciplinarity (i.e., Informed Disciplinarity) to effectively discipline-less (i.e., Conceptual Disciplinarity). By viewing IDR as a continuum, such work is easier to comprehend and
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Inform and synthetic interdisciplinary research (IDR) continuum with Lattuca’s (2001) typology. The typology should serve as a guide when conceptualizing the type of IDR or ITR.

Figure 1. IDR and ITR continuum with Lattuca’s (2001) typology. The typology should serve as a guide when conceptualizing the type of IDR or ITR.

classify. In addition, due to its similar nature, ITR should also be conceptualized on a similar continuum. Although each subdiscipline shares a common foundation built on understanding human movement, each has developed its own history and body of literature. Thus, the discipline may benefit by approaching ITR using Lattuca’s typology, striving to combine rich disciplinary knowledge to create a clearer understanding of kinesiology.

Finally, by conceptualizing IDR and ITR as a continuum instead of discrete categories, those involved in research (e.g., scientists, administrators, funders) are given more flexibility in what is defined as inter- or intradisciplinary. Flexibility allows for greater ambiguity but also fosters greater creativity. Regardless, overlaying Lattuca’s (2001) typology on a continuum provides kinesiologists a clearer definition of IDR and ITR than ever before, allowing for more constructive conversation about IDR and ITR in kinesiology (see Figure 1).

Examples of IDR and ITR in Kinesiology

While the research surrounding IDR and ITR is vague, there have been examples of such collaborations in kinesiology. However, remembering that both IDR and ITR are determined by the research question or topic (Klein, 1990), identification can be challenging and often subjective. Classifying IDR/ITR strictly by authors’ department affiliation or title can be misleading, too, because a diverse research team does not automatically make the research interdisciplinary. In addition, the academic classification scheme allows researchers affiliated in departments outside of kinesiology to conduct IDR within kinesiology, making it more difficult to differentiate IDR from ITR. Finally, both experimental and applied research can be interdisciplinary. Unfortunately, since the IDR and ITR definitions do not supply absolute selection criteria, there will always be an element of subjectivity. Thus, the following are not meant to be fully representative examples in the discipline. Instead, they are meant to serve as a starting point for discussions about possibilities available with IDR and ITR occurring in different settings and following different approaches.

The first example comes from strength and conditioning, a multidisciplinary field by nature. Strength and conditioning professionals must be knowledgeable about biomechanics, exercise physiology, nutrition, and psychology (Baechle & Earle, 2008). Thus, it is not surprising that strength and conditioning research is often, at least partially, intradisciplinary. An example is Marchant, Greig, Bullough, and Hitchen’s (2011) study that explored the influence of attentional-focusing instructions on muscular endurance. The study combined behavioral and biophysical aspects of kinesiology. Seventeen participants completed three common resistance exercises (i.e., bench press on a Smith machine, free-weight bench press, and free-weight squat), each increasing in difficulty, to failure while using externally and internally focused instructions.

As hypothesized, external-focused directions proved more effective, but more importantly for the intention here, the authors synthesized a variety of kinesiology subdisciplines (Marchant et al., 2011). The authors had an underlying applied-physiological purpose, exploring better strategies to increase an individual’s muscular endurance. However,
Marchant and colleagues utilized the constrained action hypothesis, a motor behavior theory, in executing the work. In addition, when crafting their argument, the authors also drew from sport and exercise psychology. The design of the study showed the authors’ knowledge and application of exercise physiology and biomechanics. Most impressive was the discussion section. Not surprisingly, the authors first tied the results back to relevant motor behavior literature but then to biomechanics (i.e., implications for restricted and unrestricted movements) and exercise physiology (i.e., muscular energy expenditure). Finally, the authors’ future research suggestions pertained to motor behavior, biomechanics, and exercise psychology. While Marchant and colleagues’ central focus was on motor behavior, it fulfills many of the intradisciplinary definitions described above.

The second example comes from translational research, which helps to increase the impact of IDR by attempting to narrow the gap between knowledge generation and application. The Identification and Prevention of Dietary- and Lifestyle-Induced Health Effects In Children and Infants (IDEFICS) is a multidisciplinary, community-based project aimed at reducing childhood obesity by increasing physical activity through creating successful physical activity interventions for younger children in eight European countries (Haerens et al., 2010). Obesity is a complex issue that likely cannot be solved without employing an interdisciplinary approach; thus, a formative part of IDEFICS was the authors’ study to explore psychosocial and environmental determinants of physical activity. The study reflected an extensive collaboration among kinesiology, public health, nutrition, and social medicine. It is important for kinesiology to conduct research with other disciplines (Cardinal, 2014), as long as the kinesiology focus is not lost. Thus, by conducting a kinesiology-focused study while adding other related disciplines outside the field, Haeren and colleagues took IDR a step further than did Marchant and colleagues (2011), at least in terms of Lattuca’s (2001) typologies that were introduced earlier in this article. In addition, IDEFICS answers Knudson’s (2005) call for more applied research, furthering highlighting the importance of community-based research.

Haeren and colleagues (2010) used the social ecological theory, which is multidisciplinary in nature, and conducted focus groups with parents and children of varying socioeconomic classes. The authors found that both individual determinants (e.g., age, parental beliefs, perceived barriers) and environmental determinants (e.g., outdoor space, facilities, school characteristics) contributed to one’s physical activity levels. It may appear that the findings and authors’ recommendations are native to public health, but in actuality, these are important concepts found in exercise and sport psychology and sociology. However, as reflected in the IDR continuum, some types of IDR (e.g., transdisciplinary) blend disciplinary lines, making it difficult (and unnecessary) to tease apart individual contributions. Haeren and colleagues’ qualitative study is reflective of this and, therefore, a helpful example of IDR.

Similar to IDEFICS, the third example is the Sports, Play, and Active Recreation for Kids (SPARK) program. In a review of SPARK’s history and development, McKenzie, Sallis, and Rosengard (2009) explained that SPARK is an evidence-based physical education program designed to increase activity levels through both health-fitness and motor skill-based activities; it was originally developed in 1989 with a 7-year NIH grant. In addition, the original SPARK curriculum had teacher training and taught self-management strategies (now referred to as lifelong wellness skills), such as behavioral contracting, self-monitoring, goal-setting, and decision making (McKenzie et al., 2009). The program design implemented knowledge from multiple kinesiology subdisciplines, especially motor behavior, pedagogy, physiology, and psychology. The developers drew heavily on social
cognitive theory (Bandura, 1977) to guide development, implementation, and dissemination (McKenzie et al., 2009). Thus, SPARK actually combines elements of both IDR and ITR.

Many research studies evaluating SPARK used public health interventions and dissemination techniques (McKenzie et al., 2009). Yet, as seen in Hearens et al. (2010), public health and kinesiology do share some common goals, such as increasing physical activity. Thus, while SPARK may have been tested in traditionally public health and/or education settings, it does not diminish its kinesiology-based, interdisciplinary nature. SPARK is a successful example of combining subdisciplinary knowledge and theory into an effective program that is stronger than the sum of its parts. There have been numerous physical activity interventions using SPARK (e.g., Herrick, Thompson, Kinder, & Madsen, 2012; Marcoux et al., 1999; McKenzie, Sallis, Kolody, & Faucette, 1997; Sallis et al., 1997), most of which were conducted by multidisciplinary research teams.

While the SPARK curriculum has gone through modifications since its inception, the curriculum has had success in multiple areas, including increasing physical activity in school-based physical education settings, physical fitness, motor skill development, enjoyment, and academic success (McKenzie et al., 2009). The SPARK program was originally developed for elementary schools, but there have been some successes in increasing physical activity in middle schools settings using this approach as well (McKenzie et al., 2009). Research continues on the curriculum, which is now commercialized and disseminated through SPORTIME, a publicly traded company (McKenzie et al., 2009). The success and longevity of the SPARK program demonstrates the power of both IDR and ITR when it is carefully designed and implemented.

Inter- and Intradisciplinary Teaching and Service

There is a growing body of literature centered on interdisciplinary teaching (IDT; Spelt, Biemans, Tobi, Luning, & Mulder, 2009; Woods, 2007). Similar to research, teaching or curriculum design that connects multiple subdisciplines within kinesiology should be seen as intradisciplinary teaching (ITT). With respect to kinesiology in post-secondary education, there is a shortage of research on either IDT or ITT.

Ward and Kretchmar (2008) offered preliminary suggestions for developing an integrated, collaborative kinesiology curriculum for higher education. An initial shift to an integrated approach would not require significant changes to the current undergraduate model but a more deliberate instructional “effort to discuss cross-disciplinary relationships [that] would enhance the undergraduates’ ability to connect what they have learned” (Ward & Kretchmar, 2008, p. 43). A more radical approach would be organizing kinesiology courses around thematic content (e.g., Olympics, exercise, injury) instead of specialized subdisciplinary areas (e.g., sport psychology, exercise physiology; Ward & Kretchmar, 2008). This radical approach may be more suitable for upper division undergraduate and graduate level courses. However, an introductory class may benefit from a thematic approach by introducing undergraduate students to the interconnectedness of kinesiology prior to the subdisciplinary requirements and electives.

In addition to incorporating different subdisciplines into the kinesiology curriculum, Bulger, Housner, and Lee (2008) suggested incorporating theory-to-practice models, a variety of instructional methods, and use of alternative-learning environments. These suggestions are meant to better prepare students pursuing professional (e.g., physical education teachers, personal trainers) and clinical (e.g., physical therapists, athletic trainers) careers. Thus, IDT and ITT must synthesize more than just disciplinary knowledge.
Successful IDT and ITT have the opportunity to create a unique classroom environment that emphasizes interdisciplinary knowledge with real-world relevance and experience.

Finally, research regarding interdisciplinary or intradisciplinary service is all but absent. Anecdotal evidence suggests that faculty and professional service is at least partially, if not entirely, interdisciplinary. For example, university committees are usually composed of individuals from a variety of diverse academic backgrounds. However, it appears that the type of service determines the benefit received (Cardinal, 2013). For example, serving as president of a large professional organization (e.g., American College of Sports Medicine; Society of Health and Physical Educators America) may yield larger benefits than serving on a departmental awards committee. Yet, because of the broad range of service responsibilities, future research should explore the results of interdisciplinary and intradisciplinary service.

**Conclusion**

IDR, teaching, and service have the opportunity to enhance kinesiology. It is important to note, however, that one should never disregard the need for disciplinary research or instruction. Rather, interdisciplinary ideas and techniques can successfully coincide with traditional approaches, especially in research and curriculum design. In fact, Augsburg (2005) noted that interdisciplinarity is inextricably connected to disciplinarity. As the definitions imply, IDR and ITR depend on disciplinary knowledge. Thus, IDR involves learning about how knowledge has been organized and transmitted amongst the disciplines (Augsburg, 2005). By better understanding interdisciplinary concepts and working toward applying them into the discipline, kinesiology will produce better research and better prepare practitioners for the complicated, challenging job of working with people.

**References**


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