

Research Article

Interdisciplinary Teaching in Physical Education

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Abstract

The interdisciplinary approach has risen in the modern curricula as it is considered an important and challenging technique. Physical education is a prime content area for interdisciplinary learning. In order to integrate different subject areas into Physical Education lessons, the specialist needs to learn more about the academic curriculum. Integrating core subjects with physical activity can easily be done and can be very beneficial to student learners in all levels of Education. A great effort is done in addition to be integrated with other subjects. Over the last twenty years there have been frequent internal changes at international level, which also affect pre-school curricula. This trend has been intensified in recent years, with unprecedented mobility being observed, to the point of demanding a fundamental reform of the educational mission of the kindergarten. An interdisciplinary approach has been at the core of attention in primary and secondary school education recently. In this approach, teachers collaborate to invent and apply more effective means of teaching by associating the subjects and activities of a school subject in the curriculum with other subjects. The basic aim and purpose is to cultivate skills and values such as cooperatives, flexibility, adaptability, solidarity, but above all to provide basic knowledge, exploration, classification, selection, evaluation, resolution, and observation.

Keywords: Physical education, interdisciplinary teaching, primary education, secondary education

1. Introduction

“Movement activates the body’s neural wiring, and thus the whole body becomes a learning instrument” [14].

The term “movement” describes both internal and external action and encompasses every kind of motor behaviour, from the response of the whole body, to the gross

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and fine motor skills required to perform complex tasks [36]. Movement occurs in the womb, for quite some time, before birth. In the prenatal environment, the mother's heartbeat may represent the first rhythmic experience.

As early as 400 B.C., the human body was shown to have a critical impact on other types of development. For example, Socrates (as cited in [22]) studied and found that physical health and personal care of the body had a strong influence on the development and function of the mind. The intertwined functions of the mind and body led to philosophical conclusions that the holistic individual is actually the individual who can possess a solid balance of the mind and the body. Further, researchers proposed that the two were so interrelated that the "mind and the body are not separate entities, nor does the mind consist of independent faculties or elements and the body of independent organs and processes. The organism is a single unity" ([13], p. 297).

Movement is the primary means of communication for children. Movement symbolizes their natural response to music and is vital to early childhood musical experience. Prior to language development, children use physical movement and sound to communicate with their surroundings. According to [14], children use movement to learn how to listen and interpret, respond, and explore. Movement activates and integrates connections in the brain, thus enhancing the learning process.

In [8], (Mead, 1994; Choksy, Abramson, Gillespie, Woods, York, 2001; Houlahan & Tacka 2008); Orff (Choksy et al., Warner, 1991), as well as Gardner (1999, 2006), supported the importance of movement to the learning process. They all shared the belief that movement was an essential link to learning and thinking processes. As Hannaford [14] put it: "Thinking is a response to our physical world . . . movement is an integral part of all mental processing, from the atomic movement that fires the molecular movement that orchestrates the cellular (electrical) movement, to the thought made manifest in action" (p. 107).

Movement must be an integral part of his life and education because it helps to overcome the static perception of the passive recipient cognitive information and transform knowledge into a dynamic interaction of physical and intellectual activity (Constantinou, P., 2007).

Jehue and Carlisle [10] reported that about 50% of people learn better through movement. Also, in Gardner [17] on Multiple Intelligence, interest is directed to the learner who learns better and absorbs information, as well as passes this information from their short term memory to the long term memory more efficiently, through movement (kinesthetic student). Still, [11] stated that motion develops muscle balance, an important element in the development of speech, reading, and thought. Thus, it was proposed to implement cross-thematic programs for the following reasons:

1. Active learning is promoted in many areas [6].
2. Knowledge, behaviour, skills and the likelihood of success are being developed [6].
3. The learning of relevant topics is maintained (Garcia et al., 1996), applied [6] and transferred to new conditions (Nichols, 1994).
4. For young children, movement is a simple learning tool that leads to a more integrated interaction with the subject (Werner & Burton, 1979) and enhances the learning of basic concepts such as shape, energy, space, time and the Critical Thinking.
5. Motion is a way of self-expression and social interaction.
5. Motor activities stimulate and attract children and facilitate the linking of learning experiences to everyday life (Garcia et al, 1996).
6. When body and mind are actively involved, memory develops [34, 39].

Werner (1999) argues that children who were taught academic skills through movement, learned better than those who were taught the same concepts within the traditional learning methods. Also, research results demonstrate the relationship between acquisition of knowledge and movement [9], while Stinson [34] argues that memory is enhanced when the body and the mind complement each other's feedback.

Physical education is a prime content area for interdisciplinary learning. The movement components of physical education can be used as a medium through which children are provided with opportunities to practice and strengthen language skills [33]. In ([6, 7], p. 4) agree: "interdisciplinary learning is an educational process in which two or more subject areas are integrated with the goal of fostering enhanced learning in each subject area." The interdisciplinary curriculum benefits students by enriching student learning across academic disciplines, while appreciating the knowledge and expertise brought on by other teachers.

However, according to Reed et al. [19], "Participating in regular physical activity is a necessary preventative behaviour for youth to reduce the risks of developing chronic diseases while increasing the quality and perhaps the longevity of one's life" (p. 343). If children are sitting through most of the school day, and doing homework in the evening, along with playing popular video games, there is a clear health concern. "Integrating movement into the lesson, is a practical solution to help children meet physical activity guidelines of 60 minutes or more daily" ([29], p. 318). While the movement brought into the regular classroom encourages a healthier lifestyle, research shows that many students actually learn better when physically active. "Not only does movement and exercise improve circulation and strengthen bones and muscles, it also stimulates the production of dopamine, creates stronger nerve connections, and

releases endorphins into the system ... All of these factors assist in setting the stage for learners to maximize academic achievement.” ([38], p.12). According to [32], a study of kindergartners provided evidence that suggests the benefits of interdisciplinary teaching. “Results of the study indicated that the combined physical education and reading skill instruction was more effective than the traditional separate reading and physical education instruction” ([32], p. 11).

In formal physical education programs, physical education is provided in the teaching of basic motor skills, games, sports, as well as in the development of physical fitness. Although these programs often include cognitive and emotional development goals (eg, application of rules, control, development models), emphasis is put on developing students skills to become competitive players in sports or physical activities.

2. Interdisciplinary Teaching at Preschooling

Over the last twenty years there have been frequent internal changes at international level, which also affect pre-school curricula. This trend has been intensified in recent years, with unprecedented mobility being observed, to the point of demanding a fundamental reform of the educational mission of the kindergarten (Ftehakis, W., 2003). Developing new conditions with the aim of globalization and the changing profile of expectations, increasingly changing family structures and assessment of new quality of education are some of the causes that lead to redefining the importance of education and education in the search for new ways of approaching knowledge and the development of new educational programs [23]. Preschool age, according to modern scientific data, is a critical and essential period for the child’s full development and therefore there is growing worldwide interest in pre-school education (Doliopoulos, E., 2005). Preschool education is a particular part of the educational community that is called upon to take on a more complex role in responding to modern social requirements and needs. Pedagogical science and especially Pre-school Education are institutions that are being created and recreated in the context of social development, oriented on modern social developments, since their aim is the prosperity and integration of the developing and ever-changing human society.

In the last decade, however, modern research has shown that the organization of traditional activities is not sufficient for effective learning [23]. The renewal and remodeling of pre-school education and education in general comes from within its content, expressed through various teaching approaches. These approaches, which are transferred to pedagogical practice through structured curricula, aim at the child’s short-term and long-term development, its smooth adaptation and integration into society, ensuring a lifelong learning that will help it to remain an integral and active member

of the modern society. In addition, today, these programs have been developed in a post-modernist context and attach great importance to the diversity of group children [21] in social order and ethnicity [26, 27]. The child's autonomous position, as well as his/her rights, is also emphasized. Within this framework of synchronicity, renewal and evolution, the concept and purpose of the interdependence and the unification of knowledge emerged in the implementation of the daily program in the kindergarten, in an effort for our educational system to respond to the spirit of modern times. The interdependence on the kindergarten is the starting point of the modern educational process of the young child, which is based on the philosophy of the standardization of knowledge, starting from pre-school years. In order for the nursery to be able to cope with the new social and educational conditions in which it exists, it needs to dare to make in-depth changes, both in its theoretical and practical context, ranging from the content of teaching, the role of all those involved in the learning process, methodology of teaching, even changing the area of the kindergarten itself. In addition, through the interdisciplinary approach of knowledge acquisition, it should bring out the unity of physical and social reality. The child perceives the world as a totality, a concept which is also the basic principle of Morphological Psychology.

3. Interdisciplinary Teaching at Primary School

An interdisciplinary approach has been at the core of attention in primary school education recently. In this approach, teachers collaborate to invent and apply more effective means of teaching by associating the subjects and activities of a school subject in the curriculum with other subjects.

Interdisciplinary approach is one of the newly developed approaches that are now commonly used in a wide spectrum of disciplines. Jacobs, H. ([18], pp. 3-4) defines interdisciplinary learning as "a knowledge view and curriculum approach that consciously applied methodology and language from more than one discipline to examine a central theme, issue, problem, topic, or experience". The term *interdisciplinary* is defined in Collins English Dictionary as "involving two or more academic disciplines". The curricular concept of integrating or connecting school subject areas has gained significant attention in recent years as a plausible solution to developing a more coherent, holistic and effective approach to teaching and learning [1, 5, 10]. The integrative and multi-disciplinary curricular approach related to technology education seeks to help students learn and appreciate not only the relevance, but, most importantly, the significance of how school subjects are tied together and how each subject builds on and complements the other [37].

By employing interdisciplinary techniques teachers of different disciplines can collaborate and support each other while giving way to enliven their teaching [2], (Gray & Halbert 1998). Interdisciplinary teaching requires the application of methods and language from more than one academic discipline to deal with a theme, issue, question, problem or experience. Interdisciplinary methods create connections between discrete disciplines such as mathematics, history and English language arts. Interdisciplinarity can play an essential role in education. It helps the learners to integrate school, lesson and life with one another. Furthermore, it helps learners to realize their own thinking and learning style, enabling them to think and learn effectively. Interdisciplinarity comprehends why they are learning the topic, grasps connection through disciplines and transfers their learning from one situation to another. Furthermore, the learners can comprehend the relation between the content and the process and can acquire the integrated knowledge base. In summary, an interdisciplinary approach aims to bring teachers from different disciplines together in order to solve the problem of effective teaching. As they are aware of the levels and the needs of their students, they design their syllabus and materials accordingly. Integrating various disciplines can help children comprehend a topic which may lead to effective learning.

The starting point for all discussions about the nature of knowledge in our schools should be a thorough understanding of the disciplines. As Lawton (1975) suggests, each discipline asks different questions. There are distinct frames of reference and kinds of statements, and each of these suggests unique procedures and end results that are in fact the discipline fields. The British thinker Hirst (1964) has studied how best to present knowledge systems to young people. In his view, each discipline is a form of knowledge with separate and distinct characteristics. Within each form are unique concepts and propositions that have tests to validate their truth. The motivation for discipline divisions is in part based on the notion that the disciplines encourage efficient learning. The structure of the disciplines is necessary for knowledge acquisition. It is fundamental in order to learn how things are related (Bruner, 1975). The advantage of the disciplines is that they permit schools to investigate with systematic attention to the progressive mastery of closely related concepts and patterns of reasoning (Hirst and Peters, 1974). The decision by educators to specialize goes back to Aristotle, who believed that knowledge should be divided into three areas: the productive disciplines, the theoretical disciplines, and the practical disciplines.

Modern knowledge is organized by disciplines and throughout our schooling we are exposed to discrete bodies of knowledge. The hallmark of the twentieth century in particular is the pride of specialization. This specialization has led to remarkable advances in basic science as well as phenomenal engineering feats on scales never thought

possible by previous generations. The difficulty with this specialization is that a mind-set develops which unduly exalts specialization. Compartmentalization of knowledge occurs to such a degree that the average educated person fails to see the interconnectedness of human knowledge. Since life situations come to us amorphous sets of problems and issues, artificially constructed mental walls inhibit adequate conceptualization, problem solving, and effective action. [5]

Interdisciplinary designs go further in models that Burns associates with the key actions of focusing and blending (1995 and 2002). Applebee, Burroughs, and Cruz associate the interdisciplinary approach with the active “thematic” approach, “broad-field curriculum and integrated” designs [10]. Content is revised, Burns’ notion of a new “connective depth” created, and team teaching may occur. Subjects and disciplines become tools for studying a theme, a problem, a question, or an idea. Structures vary, from engaging two subjects in a single unit or course to a year-long program, or a student’s entire educational experience in an “academy”, “whole school”, or “school-within-a-school”. Likewise, a single teacher may be involved, a large team, or an entire school, department, or program. Themes vary as well, from personal issues of identity and the body to abstract intellectual questions. For younger children, teachers often select themes related to animals and marine ecology, the planetary system, and space exploration. At varying levels of complexity across school and college, students explore themes in history (e.g. immigration, genealogy, exploration, and war), social problems (e.g. conflict, hunger, poverty, racism, AIDS, drug use, ethnic tensions, and pollution), institutions (e.g. family, community, and government), systems (e.g. transportation, the economy, and ecology and the environment), and abstract concepts (e.g. conflict, change, democracy, responsibility, and globalism). Many of these themes, as the list suggests, address cross-curricular issues in the social, political and economic world, heightening students’ understanding of the complex challenges they will face as they mature across levels of the educational system and as they become workers, citizens, and parents themselves. The greatest degree and scope of integrative restructuring is typically associated with “trans disciplinary” approaches. In schools, this level is embodied in the historically informed model of “curriculum integration”.

Human beings best develop their innate capacity for intelligent thought and action when they purposefully use it as a powerful instrument to help them solve the multitude of perplexing problems that continually confront them in their daily lives—and when they reflect on their experiences and thereby increase their capacity for future intelligent thought and action. Intelligence does not develop simply as a result of problem-solving action and experience; it develops best as a result of reflective, strategic, real-world problem-solving action and experience [4].

4. Interdisciplinary Teaching at Secondary Education

Broadly speaking, interdisciplinary work is motivated by two distinct schools of thought. First, interdisciplinary activity is embedded in an educational framework that advocates a broad, integrative curriculum [16]. Rather than teaching students to think solely through a single disciplinary point of view, the curricula in colleges and universities should instead enable students to organize and understand knowledge from multiple fields of study [17]. This emphasis speaks to the original impetus for a liberal arts education: to develop an individual capacity to discover universal ideas that give meaning to the world. Piaget and Szeminska [30] argued that the “cognitive decentring” was brought about by such an approach that it is a central element in students’ development. This broad-based effort enables students to consider multiple perspectives of social reality through a coordinated and integrated outlook.

With the implementation of the new curricula, the basic aim and purpose is to cultivate skills and values such as cooperatives, flexibility, adaptability, solidarity, but above all to provide basic knowledge, exploration, classification, selection, evaluation, resolution, and observation.

During the last three years a number of pilot programs were applied in primary and secondary education with the intention to promote a more holistic approach of education, an approach that would help pupils make the connections between different subjects, disciplines, areas of knowledge. This new trend for interdisciplinary approach in teaching and learning which can be seen to spread all over the world, is by no means revolutionary or new. It is as old as the ancient Greek ideal of the unity of knowledge.

The benefits of interdisciplinary studies are not without their disadvantages. Rahul Kanakia, author of the article titled “Talk about benefits of interdisciplinary approach, as well as some pitfalls”, quotes Donald Barr as saying “professors who focus on interdisciplinary studies isolate themselves from the core of their field,” “In contrast, interdisciplinary studies focus on the fringes of a field, which lowers an academic’s reputation in the eyes of his peers and hurts his chances for tenure” [20]. The academic system is still very much structured on the concentration of specific majors as disciplines and the integration of interdisciplinary studies have become unusual to the traditional fields of study. Rick Szostak, author of “How and Why to Teach Interdisciplinary Research Practice” explains that the methodology of the practice of interdisciplinary is lost when a single interdisciplinary course is then considered as a major field of study.

As the interdisciplinary approach continues to synthesize the characteristics and methods of multiple disciplines while developing lifelong learning skills, they will have met the goals that Newell has laid out. Interdisciplinary curricula is time consuming and

takes collaborative team work to create, which can seem like a hard and exhausting disadvantage, but in the end, the interdisciplinary approach inhibits many favored skills that are sought by future colleges and employers. Students and their teachers will advance in critical thinking, communication, creativity, pedagogy, and essential academia with the use of interdisciplinary techniques.

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