STUDIUM EDUCATIONIS
XXIV - 2 - Dicembre 2023 | ISSN 2035-844X
DOI: 10.7346/SE-022023-04

Available on-line at
https://ojs.pensamultimedia.it/index.php/studium

OPEN ACCESS

Ricevuto: 27/3/2023
Accettato: 7/11/2023
Pubblicato: 29/12/2023

STUDI E RICERCHE

Revaluating the educational significance of motor activities: a pedagogical perspective on research methods for physical education and human movement studies

Ferdinando Cereda
Associate Professor in Methods and teaching of motor activities (M-EDF/01) | Department of Education | Università Cattolica del Sacro Cuore di Milano | ferdinando.cereda@unicatt.it

Rivalutare il significato educativo delle attività motorie: una prospettiva pedagogica della ricerca per l'educazione fisica e per gli studi sul movimento umano

Abstract

Many countries require physical education as a mandatory subject in their school curriculum. The educational value of physical activity is often overlooked. To expand the scope of pedagogy beyond knowledge acquisition, alternative research methods may be necessary. Rather than solely measuring human behavior, research should focus on understanding the meaning of behavior to participants and how that meaning is formed. Different conceptual approaches to pedagogy will require different research methods. The way in which undergraduate students in human movement learn about research, including sport and exercise pedagogy research, historical research, or research in the biophysical sub-disciplines, will be crucial in fostering interest in pursuing graduate studies. Poorly designed and instructed research methods courses can be particularly discouraging for those who have an interest in research.

Keywords
physical education, motor activities, education, pedagogy, research methods

Molti paesi includono l'educazione fisica come materia obbligatoria nel curriculum scolastico, ma l'importanza educativa dell'attività fisica è spesso sottovalutata. Per ampliare la nozione di pedagogia come acquisizione di conoscenze, potrebbero essere necessari metodi di ricerca alternativi. Invece di limitarsi alla misurazione del comportamento umano, come quello dell'insegnante o dello studente, la ricerca dovrebbe concentrarsi sulla comprensione del significato del comportamento per i partecipanti e su come tale significato si forma. Il modo in cui gli studenti universitari del campo del movimento umano apprendono la ricerca, come la ricerca sulla pedagogia dello sport e dell'esercizio fisico, la ricerca storica o la ricerca nelle discipline biofisiche, gioca un ruolo critico nello stimolare l'interesse a proseguire gli studi post-laurea.

Parole chiave
educazione fisica, attività motorie, educazione, pedagogia, metodi di ricerca

1. Introduction

The pedagogical reinterpretation of the role that motor activities play in formal or informal learning contexts has been prompted by a significant and marked reduction in their educational significance at all levels (Chow et al., 2021, 2023). It has continuously observed topics that should primarily be the subject of educational discussion being translated into treatises on physical training programming, analysis of the causes, modalities, and forms of human movement, energy expenditure, or the effects of exercise on physical health (Melanson et al., 2017; Fedewa et al., 2017).

In this context, the body, for example, is considered as a thing among things in the world, becoming an object that must be kept healthy through a mechanical and repetitive practice in which motivations, responses to why, and values are referred to different domains (Neville, 2013; Casolo, Vago, 2019; Polenghi et al., 2022). Even the scientific literature of reference has focused almost exclusively on empirical research related to the maturation and control of learning processes, performance and (quantitative) evaluation of motor skills, abilities, and competencies (Malambo et al., 2022; Barnet et al., 2022).

Pedagogy is a realm of scholarly inquiry devoted to the sphere of education and instruction. This discipline is profoundly engaged in elucidating the processes of human learning and how the art of teaching may ameliorate this very process. Pedagogy involves the meticulous scrutiny of various methods and approaches to instruction, the efficacy of these methodologies, and the means by which they may be refined. Furthermore, pedagogy delves into the ethical and philosophical quandaries tethered to the realm of education and instruction (Solmon, 2021; Tinning, 2010).

The pedagogy of sports, or sport pedagogy, constitutes a specialized subdomain of pedagogy that directs its focus towards the domains of teaching and learning within the athletic arena. This domain of study diligently investigates the modus operandi by which coaches, physical education instructors, and other sports professionals may expedite the acquisition of knowledge and the development of athletes. The pedagogy of sports encompasses the analysis of how athletes acquire novel skills, how coaches can expedite this process, and how the learning environment can be optimized to foster athletic development. Moreover, the pedagogy of sports examines the ethical and societal concerns associated with instruction and learning within the realm of sports.

The pedagogy of sports is a multidimensional field of inquiry that necessitates a profound comprehension of learning theories, teaching techniques, sports psychology, and allied disciplines. This sphere of study is steadfast in its dedication to crafting an effective milieu for athlete learning, developing efficacious training regimens, and appraising and enhancing athlete performance.

In the field of education and kinesiology, the terms «pedagogy» and «instruction» are often used interchangeably, causing conceptual confusion. However, the distinction between these two terms is not straightforward. Didactics, a term associated with teaching and the efficient transmission of knowledge, was the focus of educational research in the United States until the 1960s. With the rise of behavioral science, didactics became associated more with the science of teaching. Recently, pedagogy has emerged as a distinct process rather than a technique, separating itself from didactics (Cereda, 2023, p. 55). In the European kinesiology context, Herbert Haag (2005), a German sport pedagogue, argued that sport didactics is essentially synonymous with sport instruction and encompasses all factors important for optimal teaching and learning processes (p. 47). This quotation highlights the overlap between the terms didactics, instruction, teaching, and pedagogy.

If one seeks a precise and practical definition of pedagogy, the Oxford English Dictionary (Simpson & Weiner, 1989) provides «the art or science of teaching» (p. 418), while Encarta World English Dictionary (1999) offers similar connotations. Additionally, there are related terms that are frequently used in educational contexts, such as didactics and teaching. Didactics is a formal term that refers to «the science or profession of teaching» and is typically used in the singular form. On the other hand, teaching is a broader term that encompasses both the profession and practice of being a teacher, as well as the material that is taught, such as a point of doctrine. Finally, instruction is a term that pertains to the teaching of a specific subject or skill, as well as the process and profession of teaching itself.

The educational significance of physical activity and the objectives it should embody in promoting an individual's gradual self-determination and accountability are too often ignored. Moreover, the meanings of «Physical Activity,» «Physical Education,» «Sport,» and «Exercise» are often muddled, revealing the in-

sufficiency of the theoretical framework in this field of research and knowledge, commonly referred to as «Motor Sciences» (Caspersen et al., 1985; Howley, 2001; Lipoma, 2014, Dasso, 2019). The absence of clear-cut definitions results in overlapping semantics, which, in addition to highlighting the dearth of specific concepts and areas of research in movement education, inevitably affect the quality of educational practice (Donnelly et al., 2016; Petrigna et al., 2022).

One of the main issues addressed was the definition of the concept upon which to construct a research trajectory on the pedagogical ontologies of the didactics of motor activities and to formulate a hierarchical map of the knowledge associated with it (Gråstén, Watt, 2017; Tinning, 2012a; Wang, Chen, 2020)

To clarify definitions, national and international literature was analyzed. Italian definitions were found to be broad and inclusive, while international ones emphasized the medical specialization of Exercise Science and its goals of maintaining health and treating problems. Physical Activity (PA) and Exercise were understood as planned bodily movements (Cereda, 2013), and Sport Science focused on enhancing athletic performance through physical training (Barlett, Drust, 2021).

2. Physical Education and Educazione Fisica

Many countries around the world include physical education (PE) as a compulsory subject in their school curriculum. Although there are regional and national differences in terms of time allocation, core content, and resources, PE typically covers physical activity (PA), sports and movement education, as well as health and lifestyle topics (Hardman et al., 2013). The educational benefits attributed to PE encompass not only physical domains but also cognitive, social, and affective domains (Bailey et al., 2009). The PE classroom usually involves PA, and the activities performed may promote learning of movement capability, as well as encourage lifelong PA and healthy lifestyle choices (Hollis et al., 2016; Hollis et al., 2017; McKenzie & Lounsbery, 2014; Sallis et al., 2012;).

Moreover, PE provides opportunities for positive social interactions and cooperation (Bailey et al., 2009; Beni et al., 2017; Opstoel et al., 2020).

Despite the potential educational benefits, contemporary physical education (PE) is facing several critical issues, according to research. For instance, the PE curriculum based on multiple activities has been criticised for following a conventional sports logic that legitimises a narrow set of sport-related activities (Nabaskues-Lasheras et al., 2020; Tinning, 2012b), leading to some studies indicating that PE is seen more as a recreational activity than an environment for learning (Larson, Karlefors, 2015). Additionally, some PE teachers and pupils appear unaware of their respective roles and expectations (Redelius et al., 2015; Lundvall, Meckbach, 2008). Furthermore, the significance of the multi-activity-based curriculum has been called into question, as it has limited relevance for pupils beyond PE (Penney, Jess, 2004; Ennis, 2015). Consequently, some researchers have highlighted the necessity for PE teachers to be innovative in their approach to the curriculum, designing open tasks that can lead to a wide range of educational outcomes (Ennis, 2015).

In addition, although health and lifestyle topics are typically part of the Physical Education curriculum, it is unclear how health is defined and contextualized in this subject area (Mong, Standal, 2019; Pühse et al., 2011). The biomedical perspective dominates the understanding of health in PE, which ignores social and cultural aspects as well as alternative (salutogenic) perspectives of health (Mong, Standal, 2019; Taylor et al., 2016). Despite the growing research on environmental exposures and their positive effects on human health, environmental health remains a neglected topic in PE and is under-researched (Taylor et al., 2016; Taylor et al., 2019; Johansson et al., 2019). From a pedagogical standpoint, the biomedical perspective focuses mainly on physical activity for health, which implies that increased physical activity equates to better health, suggesting that PE should provide opportunities for students to participate in physical activity.

Despite ongoing debates on some issues in physical education (PE) over the course of several decades, it appears that PE has remained resistant to change over time, as noted by Tinning (2012b) and Kirk (2009). There are likely various factors contributing to this resistance, including the extensive experience that pre-service PE teachers tend to have in physical activity (PA) and sports, as highlighted by Ferry (2018) and Larsson (2010). Additionally, the challenges facing modern-day PE may reflect inadequacies

in the education of PE teachers (PETE). Research suggests that PETE may have limited effectiveness in altering pre-service PE teachers' perceptions and beliefs about PE, as discussed by Richards et al. (2014).

It's possible to argue that Physical Education and *Educazione Fisica* in Italy require a separate discussion. Physical Education encompasses the learning of movement throughout the entire life cycle (Trudeau & Shepard, 2008; Piggin, 2020), whereas *Educazione Fisica* is limited to the school discipline regulated by specific *National Guidelines* (Colella, 2018; Lipoma, 2014).

Other significant aspects emerge from a critical review of the changes made in Italian legislation concerning the programmatic guidelines for motor education in early childhood and primary school from the 1980s to the present day (Vicini, 2017). Despite various legislative interventions aimed at early childhood and primary education, a unique and stable denomination for motor activities has not been identified. Therefore, it can be concluded that the meaning of the concept of motor activity in an educational context, or preferably, motor education, is still being defined considering the evolutions/regressions of the past few decades. Additionally, it is equally evident that terminological confusion reflects a deeper confusion that inevitably affects the curriculum's content.

The term *educazione motoria* (EM) could be the most appropriate to summarize the educational significance of physical activity and the contribution it makes to an individual's overall education. It refers to a set of intentional or implicit processes that support personal growth and enhance the learning of specific skills and competencies related to human movement. EM encompasses physical, intellectual, cognitive, emotional, motivational, and socio-relational dimensions. Its aims are to promote awareness of the meaning and value of bodily movement, develop responsible autonomy and encourage free expression of personality, with the goal of adopting a healthy lifestyle (Lipoma, 2014, p. 198).

3. Evidence based pedagogy?

The human movement profession centers around physical activity in all its various forms. Within universities, various disciplines focus on different aspects of physical activity. Sport sociologists examine both the structural and agentic factors influencing participation in physical activity. Exercise scientists focus on the biophysical responses to and mechanisms supporting performance in physical activity. Physical activity and health specialists investigate the epidemiological evidence surrounding activity, morbidity, and mortality in populations and conduct intervention studies to measure the effects of physical activity on various health parameters. Sport psychologists analyze individual motivation for and participation in physical activity. Sport historians study the historical origins and significance of physical activity in different cultures. Finally, sport pedagogy specialists should focus on the pedagogical processes involved in teaching physical activity.

Teachers, coaches, and instructors in schools, sports clubs, health clubs, and dance studios typically assist their students in performing physical activities. While some may incorporate findings from their university colleagues to inform their pedagogical practices, others rely on tradition rather than research. When discussing pedagogy and human movement, it is reasonable to assume that physical activity requires engagement with the body, and therefore, a pedagogy for physical activity must also embody a pedagogy for the body. This bodily engagement can also have implications for one's health, as individuals who engage in activities such as dance lessons not only learn how to perform the dance but also acquire knowledge about their own bodies and health.

To achieve this objective, it is essential to direct attention to the ways in which knowledge related to physical activity, the body, and health (both practical and theoretical) is created and propagated within the realm of Health and Medical Sciences (HMS). It may be beneficial to examine pedagogies for physical activity, the body, and health separately, although in practice, pedagogical approaches often intersect across these categories. The boundaries between these categories may be blurry, especially in discussions regarding the body and health, which is frequently observed in the literature.

The quality of pedagogical research has been a long-standing concern for both Italy and the international community. As a result, the principle of Evidence-Based Education (EBE) has emerged as an alternative to traditional research that challenges the guidelines of validation based on internal criteria from various investigative approaches. EBE proposes external validation criteria based on the social and econo-

mic impact of educational capital production. EBE not only guides researchers towards Evidence-Based Research (EBR), which often leads to Evidence-Based Practice, but is also believed to directly impact Anglo-American educational policy choices (Evidence-Based Policy) (Viganò, 2016).

Evidence-based education is an approach to teaching and learning that emphasizes the use of research evidence to inform educational practice (Slavin, Cheung, Zhuang, 2021). It involves the integration of the best available research evidence with the professional expertise of educators and the values and preferences of students and families (Parrish, 2018). Evidence-based education is based on the idea that educational practices should be grounded in empirical evidence, rather than tradition, intuition, or ideology (Turvey, 2018).

The following are some key features of evidence-based education.

– Research evidence: Evidence-based education involves the use of research evidence to inform educational practice. This includes both quantitative and qualitative research, as well as evidence from practice-based sources such as teacher experience and student feedback (Slavin, Cheung, Zhuang , 2021).
– Professional expertise: Evidence-based education recognizes the importance of professional expertise in educational decision-making. Educators are encouraged to use their professional judgment and experience to interpret and apply research evidence in their specific contexts (Parrish, 2018).
– Student and family values and preferences: Evidence-based education recognizes that students and families have unique values and preferences that should be taken into account when making educational decisions. This includes factors such as cultural background, learning style, and personal interests (Parrish, 2018).
– Continuous improvement: Evidence-based education involves a commitment to continuous improvement. Educators are encouraged to regularly evaluate the effectiveness of their practices and make adjustments based on new evidence and feedback (Slavin, Cheung, Zhuang, 2021).

Overall, evidence-based education is an approach to teaching and learning that emphasizes the use of research evidence to inform educational practice, while also recognizing the importance of professional expertise and the values and preferences of students and families.

The goals that drive the supporters of EBE are highly interconnected and align with the validation criteria as follows (Biesta, 2014; Calvani, Menichetti, 2013; Trinchero, 2019):

– establish educational policies and practices based on research outcomes;
– enhance the scientific quality of educational research, particularly its ability to provide causal evidence of the effects of educational activities;
– give priority to methodologies that respond to these objectives, particularly experimental or empirical methods;
– offer systematic and public evaluations of conducted research to facilitate the dissemination and meta-analysis of the findings.

Pedagogical research has received many criticisms against the EBE protocol, especially for its quantitative-empirical methodological components taken from natural and medical sciences. Conversely, proponents of alternative research methodologies highlight the limitations of the educational research systems that have been given priority so far. These limitations include (O'Connor, 2022; Rogers, 2021; Whitty, 2006):

– research works that deal with the same topic but ignore each other, resulting in partial conclusions that lack cumulative character;
– research that often resembles political-ideological professions of faith;
– procedures that are confused and unclear, both in identifying research focuses and protocols;
– methodologies that privilege qualitative aspects of research to the detriment of rigorous empirical foundations, and studies that are not widely disseminated, little known even to researchers themselves, and not very productive.

In Italy, it seems that these issues and their implications for the development and fundraising policies of pedagogical research are not widely debated (Viganò, 2016).

To choose a pedagogy based on research evidence that works, the chance must be considered (Trinchero, 2019). Firstly, it is necessary to go back to the question of what the intent of the pedagogy is. If the aim is to determine which pedagogical strategy to use to teach a basketball shot, specific research focused on that skill might be found. However, in the absence of a particular study that used the same type of class (same age, same skill level, same sex, same age, etc.), it would be necessary to «go generic». This entails considering the results of research into the teaching of motor skills in general and then making some generalizations to the particular context.

Evidence-based medicine is different from teaching physical activity and motor skills. Exercise physiology research cannot provide the exact or best dose of exercise for a particular school-age child to achieve specific health benefits. The science is not definitive. The same applies to motor skills. Teachers or coaches usually work with a group or an entire class, and the available research offers some generalizations that may work for most of the group/class. However, if the aim is to teach a positive attitude towards physical activity, a disposition for a lifetime of participation, the relevant pedagogy research needs to be identified.

There is plenty of research that demonstrates that many children are turned off physical education and sports due to their experiences in PE and sports classes (Kliziene et al., 2021; Martins et al., 2020; Martins et al., 2022). It is possible to generalize that certain active mesomorphs are easier to engage, and objectives are more likely to be achieved with them than with some others in the class. Placek and Locke (1986) argued almost 40 years ago that despite the developments and proliferation of research on teaching physical education from the mid-1960s, most physical educators working in school settings, continue to teach much as they always have, quite untouched by research findings. It is that fact that lends the cautious tone to any contemplation of pedagogical knowledge in physical education.

It was claimed by Lawson (1990) that although a great deal of information had been gathered on PE pedagogy through decades of research on teaching PE, there was less useful knowledge. It raises the question of what the judgment would be today after another 30 years of research in pedagogy. Kirk (1989) argued that the way in which the research was conceived and conducted contributed to the limited impact of research into PE teaching on curriculum practice. He identified this as part of the perceived theory-practice gap that researchers from universities often lament. According to Kirk (1989), part of the problem was the dominance of an orthodoxy that favored natural science research methods, resulting in theory [being] often treated with indifference, even held in contempt, by many educational practitioners.

According to Macdonald (2007), accepting scientific evidence as the «gold standard» for evidence-based practice without question would be short-sighted since much cannot be understood through a technical, positivistic logic. Macdonald acknowledges that although the «gold standard» might sometimes be unreliable, it is unwise to dismiss quantitative evidence outright. Luke's observation (2002) that quantitative educational research is not antithetical to social justice, nor is qualitative research necessarily empowering, transformative, and progressive is also cited.

According to Montalbetti (2020), reflection on empirical research training has been situated within the theoretical and conceptual framework of research as a crucial component of professionalism and teaching practice that intersects the realms of thinking and action.

However, it must be understood that policy makers and bureaucrats are only interested in evidence represented by the voice of logos. Therefore, presenting a wonderful case study or autoethnography to policy makers and expecting it to influence policy would be futile.

4. The role of research instruction

Several significant issues are faced by research in sport pedagogy and in the pedagogy of human movement science (HMS) itself. The first issue pertains to the training of future pedagogy researchers, and the second issue pertains to the increasingly competitive academic environment. Regarding training, it is necessary to determine what research methods should be taught to graduate students. Should they be competent in quantitative methods, qualitative methods, or poststructural methods? Should they possess a working kno-

wledge of phenomenology, critical theory, postcolonialism, behavior analysis, and life history? Should they know some Foucault, Bourdieu, Bernstein? How about Piaget, Vygotsky, Lave, and Wenger?

Various forms of research training are offered as part of graduate education (Pearce, 2014; Lewthwaite, Nind, 2016; Nind, Lewthwaite, 2018; Viganò, 2016), and acknowledging this fact, Silverman and Keating (2002) conducted a descriptive analysis of introductory graduate research methods classes in departments of kinesiology and physical education (PE) in the United States. The study found that introductory courses could only provide a superficial level of understanding and competence in these objectives, and more specialized courses may be required. In terms of curriculum emphasis, the study found that quantitative design and analysis topics were given more emphasis than qualitative design and analysis topics, and alternative research methodologies were not quickly incorporated into the research methods curriculum.

Achieving comprehensive coverage of the breadth and variety of research methods and issues would pose a challenge in an introductory level course. The type of research training necessary for graduate students would be influenced by the definition of pedagogy. If pedagogy is considered the science of teaching, it would presumably require research traditions of the sciences. However, since science encompasses a wide range of research methods and designs, it is unclear which sciences should be considered, as the natural sciences, hypothetico-deductive science, or the behavioral sciences (Pratt et al., 2019). These distinctions are not trivial. For example, while earth sciences such as geology and archaeology do not typically employ experimental methods with control and experimental groups, as it is difficult to step in in the formation of an igneous rock formation, psychological sciences utilize extensive psychometric measures and statistical analysis to examine their results.

In their scientific work, behaviour analysts employ single-case designs, observation, and recording of human behaviour as data, rather than relying on psychometric measures such as pencil and paper tests, and use graphical analysis techniques instead of statistical ones. These differences are rooted in epistemological distinctions between measures used in the natural sciences and those used in the psychological sciences (Viganò, 2010, 2019). The question arises whether students should be introduced to such distinctions early in their training. From this perspective, they should. However, if the notion of pedagogy is considered more broadly as the of acquiring knowledge, alternative research methods may be process required (Montalbetti, 2020).

For instance, cultural studies, feminist research, and poststructuralist analysis may prove useful. In such research, the focus is not on measuring human behavior (e.g., teacher and pupil behaviors), but on attempting to elicit the meaning of behavior to the participants themselves and to comprehend how that meaning is possible (i.e., under what conditions certain meanings may be entertained). It is unquestionable that diverse conceptual approaches to pedagogy will necessitate different paradigmatic research methods.

The way undergraduate students in the field of HM learn about research, such as for sport and exercise pedagogy research, historical research, or research in the biophysical sub-disciplines, will play a critical role in stimulating interest in pursuing graduate (postgraduate) study. A poorly designed and instructed research methods course can be particularly discouraging for those who wish to develop an interest in research.

References

Bailey R., Armour K., Kirk D., Jess M., Pickup I., Sandford R., Education B. P. (2009). The educational benefits claimed for physical education and school sport: an academic review. *Research papers in education*, *24*(1), 1-27.

Barnett L. M., Webster E. K., Hulteen R. M., De Meester A., Valentini N. C., Lenoir M., Pesce C., Getchell N., Lopes V. P., Robinson L. E., Brian A., Rodrigues L. P. (2022). Through the Looking Glass: A Systematic Review of Longitudinal Evidence, Providing New Insight for Motor Competence and Health. *Sports medicine (Auckland, N.Z.)*, *52*(4), 875–920. https://doi.org/10.1007/s40279-021-01516-8

Bartlett J. D., Drust B. (2021). A framework for effective knowledge translation and performance delivery of Sport Scientists in professional sport. *European journal of sport science*, *21*(11), 1579–1587. https://doi.org/-10.1080/17461391.2020.1842511

Beni S., Fletcher T., Ní Chróinín D. (2017). Meaningful experiences in physical education and youth sport: A review of the literature. *Quest*, *69*(3), 291-312.

Biesta G. (2014). Evidence based practice in education: Between science and democracy. *A companion to research in education*, 391-400.

Calvani A., Menichetti L. (2013). Evidence Based Education: superare il gap tra ricerca e pratica. *Form@re*, 2 (13), pp. 1-5. Link.

Casolo F., Vago P. (2019). Educazione motoria e cultura della corporeità nella scuola primaria. In M. Musaio, S. Nosari, F. Casolo (Eds.), *Pedagogia e cultura della corporeità nell'età evolutiva*. Milano: Vita e Pensiero.

Caspersen C. J., Powell K. E., Christenson G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public health reports (Washington, D.C.: 1974)*, *100*(2), 126-131.

Cereda F. (2013). *Teoria, tecnica e didattica del fitness*. Vita e Pensiero: Milano.

Cereda F. (2023). *Methods and Teaching of Motor Activities - From Theory to Evidence Practice*. Mantova: Universitas Studiorum.

Chow J. Y., Komar J., Seifert L. (2021). The Role of Nonlinear Pedagogy in Supporting the Design of Modified Games in Junior Sports. *Frontiers in psychology*, *12*, 744814. https://doi.org/10.3389/fpsyg.2021.744814

Chow J. Y., Meerhoff L. A., Choo C. Z. Y., Button C., Tan B. S. (2023). The effect of nonlinear pedagogy on the acquisition of game skills in a territorial game. *Frontiers in psychology*, *14*, 1077065. https://doi.org-/10.3389/fpsyg.2023.1077065

Colella D. (2018). Physical Literacy e stili d'insegnamento. Ri-orientare l'educazione fisica a scuola. *Formazione & insegnamento*, *16*(1 Suppl.), 33-42.

Dasso N. A. (2019). How is exercise different from physical activity? A concept analysis. *Nursing forum*, *54*(1), 45–52. https://doi.org/10.1111/nuf.12296

Donnelly J. E., Hillman C. H., Castelli D., Etnier J. L., Lee S., Tomporowski P., Lambourne K., Szabo-Reed A. N. (2016). Physical Activity, Fitness, Cognitive Function, and Academic Achievement in Children: A Systematic Review. *Medicine and science in sports and exercise*, *48*(6), 1197-1222. https://doi.org/10.1249/MSS.0000-000000000901

Ennis C. D. (2015). Knowledge, transfer, and innovation in physical literacy curricula. *Journal of Sport and Health Science*, *4*(2), 119-124.

Fedewa M. V., Hathaway E. D., Williams T. D., Schmidt M. D. (2017). Effect of Exercise Training on Non-Exercise Physical Activity: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Sports medicine* (Auckland, N.Z.), 47(6), 1171–1182. https://doi.org/10.1007/s40279-016-0649-z

Ferry, M. (2018). Physical education preservice teachers' perceptions of the subject and profession: Development during 2005–2016. *Physical Education and Sport Pedagogy*, *23*(4), 358-370.

Gråstén A., Watt A. (2017). A Motivational Model of Physical Education and Links to Enjoyment, Knowledge, Performance, Total Physical Activity and Body Mass Index. *Journal of sports science & medicine*, *16*(3), 318–327.

Haag H. (2005). Concerning the concept of sport pedagogy by help of the macro-mezomicro paradigm. In F. Carreiro da Costa *et al.* (Eds.), *The art and science of teaching in physical education and sport* (pp. 41-49). Lisboa: Faculdade de Motricidade Humana, Universidas de Technica de Lisboa.

Hardman K., Murphy C., Routen A., Tones S. (2013). *World-wide survey of school physical education*.

Hollis J. L., Sutherland R., Williams A. J., Campbell E., Nathan N., Wolfenden L., ... Wiggers J. (2017). A systematic review and meta-analysis of moderate-to-vigorous physical activity levels in secondary school physical education lessons. *International Journal of Behavioral Nutrition and Physical Activity*, *14*, 1-26.

Hollis J. L., Williams A. J., Sutherland R., Campbell E., Nathan N., Wolfenden L., Morgan P. J., Lubans D. R., Wiggers J. (2016). A systematic review and meta-analysis of moderate-to-vigorous physical activity levels in elementary school physical education lessons. *Preventive medicine*, *86*, 34-54. https://doi.org/10.10-16/j.ypmed.2015.11.018

Howley E. T. (2001). Type of activity: resistance, aerobic and leisure versus occupational physical activity. *Medicine and science in sports and exercise*, *33*(6 Suppl), S364-S420. https://doi.org/10.1097/00005768-200106001-00005

Johansson M., Hartig T., Staats H. (2011). Psychological benefits of walking: Moderation by company and outdoor environment. *Applied psychology: health and well being*, *3*(3), 261-280.

Kirk D. (1989). The orthodoxy in RT- PE and the research/practice gap: A critique and an alternative view. *Journal of Teaching in Physical Education*, 8, 123–130.

Kirk D. (2009). *Physical education futures*. Routledge.

Kliziene I., Cizauskas G., Sipaviciene S., Aleksandraviciene R., Zaicenkoviene K. (2021). Effects of a Physical Education Program on Physical Activity and Emotional Well-Being among Primary School Children. *International journal of environmental research and public health*, *18*(14), 7536. https://doi.org/10.3390/ijerph18147536

Larsson H., Karlefors I. (2015). Physical education cultures in Sweden: Fitness, sports, dancing… learning?. *Sport, Education and Society*, *20*(5), 573-587.

Larsson L. (2010). Sport–and preferably a little more sport: PE student teachers' encounter with their education. In *AARE 2010 International Education Research Conference-Melbourne,* November 29-December 2, 2010.

Lawson H.A. (1990). Sport pedagogy research: From information-gathering to useful knowledge. *Journal of Teaching in Physical Education*, 10(1), 1-20.

Lewthwaite S., Nind M. (2016). Teaching Research Methods in the Social Sciences: Expert Perspectives on Pedagogy and Practice, *British Journal of Educational Studies*, 64, 4, 413-430.

Lipoma M. (2014). Le ontologie pedagogiche dell'educazione motoria. In U.Margiotta (Ed.), *Qualità della ricerca e documentazione pedagogica*. Lecce: Pensa MultiMedia.

Luke, A. (2002). Curriculum, ethics, metanarrative: Teaching and learning beyond the nation. *Curriculum Perspectives*, 22(1), 49–55.

Lundvall S., Meckbach J. (2008). Mind the gap: physical education and health and the frame factor theory as a tool for analysing educational settings. *Physical Education and Sport Pedagogy*, *13*(4), 345-364.

Macdonald D. (2007). Evidence-based practice in physical education: Ample evidence, patchy practice". Paper presented at the "History and Future Directions of Research on Teaching and Teacher Education in PE" Conference, Pittsburgh, Pennsylvania.

Malambo C., Nová A., Clark C., Musálek M. (2022). Associations between Fundamental Movement Skills, Physical Fitness, Motor Competency, Physical Activity, and Executive Functions in Pre-School Age Children: A Systematic Review. *Children (Basel, Switzerland)*, *9*(7), 1059. https://doi.org/10.3390/children9071059

Martins J., Marques A., Gouveia É. R., Carvalho F., Sarmento H., Valeiro M. G. (2022). Participation in Physical Education Classes and Health-Related Behaviours among Adolescents from 67 Countries. *International journal of environmental research and public health*, *19*(2), 955. https://doi.org/10.3390/ijerph19020955

Martins J., Marques A., Peralta M., Henriques-Neto D., Costa J., Onofre M., González Valeiro M. (2020). A Comparative Study of Participation in Physical Education Classes among 170,347 Adolescents from 54 Low-, Middle-, and High-Income Countries. *International journal of environmental research and public health*, *17*(15), 5579. https://doi.org/10.3390/ijerph17155579

McKenzie, T. L., & Lounsbery, M. A. (2014). The pill not taken: revisiting Physical Education Teacher Effectiveness in a Public Health Context. *Research quarterly for exercise and sport*, *85*(3), 287-292. https://doi.org/-10.1080/02701367.2014.931203

Melanson E. L. (2017). The effect of exercise on non-exercise physical activity and sedentary behavior in adults. *Obesity reviews: an official journal of the International Association for the Study of Obesity*, *18 Suppl 1*(Suppl 1), 40–49. https://doi.org/10.1111/obr.12507

Mong, H. H., Standal, Ø. F. (2019). Didactics of health in physical education–a review of literature. *Physical Education and Sport Pedagogy*, *24*(5), 506-518.

Montalbetti, K. (2020). Formare i futuri insegnanti alla ricerca empirica. Dalla teoria alla pratica. *Pedagogia Oggi*, *18*(1), 168-182.

Nabaskues-Lasheras, I., Usabiaga, O., Lozano-Sufrategui, L., Drew, K. J., Standal, Ø. F. (2020). Sociocultural processes of ability in physical education and physical education teacher education: A systematic review. *European Physical Education Review*, *26*(4), 865-884.

Neville R. D. (2013). Exercise is medicine: some cautionary remarks in principle as well as in practice. *Medicine, health care, and philosophy*, *16*(3), 615-622. https://doi.org/10.1007/s11019-012-9383-y

Nind M., Lewthwaite S. (2018). Methods that teach: developing pedagogic research methods, developing pedagogy, International Journal of Research & Method in Education, 41:4, 398-410, DOI: 10.1080/1743727-X.2018.1427057

Norris E., Shelton N., Dunsmuir S., Duke-Williams O., Stamatakis E. (2015). Physically active lessons as physical activity and educational interventions: a systematic review of methods and results. *Preventive medicine*, *72*, 116–125. https://doi.org/10.1016/j.ypmed.2014.12.027

O'Connor J. (2022). Evidence based education policy in Ireland: insights from educational researchers, Irish Educational Studies, DOI: 10.1080/03323315.2021.2021101

Olive R., Enright E. (2021). Sustainability in the Australian health and physical education curriculum: An ecofeminist analysis. *Sport, Education and Society*, *26*(4), 389-402.

Opstoel K., Chapelle L., Prins F. J., De Meester A., Haerens L., van Tartwijk J., De Martelaer K. (2020). Personal and social development in physical education and sports: A review study. *European Physical Education Review*, *26*(4), 797-813.

Parrish D.E. (2018). Evidence-Based Practice: A Common Definition Matters. *Journal of Social Work Education, 54*, 407-411.

Pearce P. F., Christian B. J., Smith S. L., Vance D. E. (2014). Research methods for graduate students: a practical framework to guide teachers and learners. *Journal of the American Association of Nurse Practitioners*, *26*(1), 19-31. https://doi.org/10.1002/2327-6924.12080

Penney D., Jess, M. (2004). Physical education and physically active lives: A lifelong approach to curriculum development. *Sport, education and society*, *9*(2), 269-287.

Petrigna, L., Thomas, E., Brusa, J., Rizzo, F., Scardina, A., Galassi, C., Lo Verde, D., Caramazza, G., & Bellafiore, M. (2022). Does Learning Through Movement Improve Academic Performance in Primary Schoolchildren? A Systematic Review. *Frontiers in pediatrics*, *10*, 841582. https://doi.org/10.3389/fped.2022.841582

Piggin J. (2020). What Is Physical Activity? A Holistic Definition for Teachers, Researchers and Policy Makers. *Frontiers in sports and active living*, *2*, 72. https://doi.org/10.3389/fspor.2020.00072

Placek J., Locke L. (1986). Research on teaching physical education: New knowledge and cautious optimism. *Journal of Teacher Education*, 37(4), 24-28.

Polenghi S., Némethe A., Kasper T. (2022). Corpo ed educazione. Un tema di ricerca poliedrico e complesso. In S. Polenghi, A. Némethe, T. Kasper (Eds.), *Corpo ed educazione in Europa (1900-1950) - Movimenti socioculturali, salute pubblica, norme pedagogiche*. Bergamo: Junior.

Pratt D. D., Schrewe B., Pusic M. V. (2019). Pedagogical validity: The key to understanding different forms of 'good' teaching. *Medical teacher*, *41*(6), 638-640. https://doi.org/10.1080/0142159X.2018.1533242

Pühse U., Barker D., Brettschneider W. D., Feldmeth A. K., Gerlach E., McGuaig L., ... Gerber M. (2011). International approaches to health-oriented physical education: Local health debates and differing conceptions of health. *International journal of physical education*, *48*, 2-15.

Redelius K., Quennerstedt M., Öhman M. (2015). Communicating aims and learning goals in physical education: Part of a subject for learning? *Sport, Education and Society*, *20*(5), 641-655.

Richards K. A. R., Templin T. J., Graber K. (2014). The socialization of teachers in physical education: Review and recommendations for future works. *Kinesiology Review*, *3*(2), 113-134.

Rogers B. (2021). The Rise and Fall of Evidence-Based Research. In *The Palgrave Handbook of Educational Leadership and Management Discourse*. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-39666-4_64-1

Sallis J. F., McKenzie T. L., Beets M. W., Beighle A., Erwin H., Lee S. (2012). Physical education's role in public health: steps forward and backward over 20 years and HOPE for the future. *Research quarterly for exercise and sport*, *83*(2), 125–135. https://doi.org/10.1080/02701367.2012.10599842

Silverman S., Xiaofen Deng Keating X. D. (2002). A Descriptive Analysis of Research Methods Classes in Departments of Kinesiology and Physical Education in the United States. *Research Quarterly for Exercise and Sport*, 73, 1, 1-9.

Simpson J.A., Weiner E.S. (Eds.) (1989). *The Oxford English dictionary* (2nd ed.). Oxford: Claredon Press.

Slavin R.E., Cheung A.C., Zhuang T. (2021). How Could Evidence-Based Reform Advance Education? *ECNU Review of Education, 4*, 7-24.

Solmon M. A. (2021). Physical education and sport pedagogy: The application of the academic discipline of kinesiology. *Kinesiology Review*, *10*(3), 331-338.

Taylor N., Wright J., O'Flynn G. (2016). HPE teachers' negotiation of environmental health spaces: Discursive positions, embodiment and materialism. *The Australian Educational Researcher*, *43*, 361-376.

Taylor N., Wright J., O'Flynn G. (2019). Embodied encounters with more-than-human nature in health and physical education. *Sport, Education and Society*, *24*(9), 914-924.

Tinning R. (2010). *Pedagogy and Human Movement. Theory, Practice, Research*. 1st edition. New York: Routledge.

Tinning R. (2012a). A socially critical HPE (aka physical education) and the challenge for teacher education. *Critical voices in teacher education: Teaching for social justice in conservative times*, 223-238.

Tinning R. (2012b). The idea of physical education: A memetic perspective. *Physical Education & Sport Pedagogy*, *17*(2), 115-126.

Trinchero R. (2013). Sappiamo davvero come fa apprendere? Credenza ed evidenza empirica. *Form@re*, 2 (13), 52-67.

Trinchero R. (2017). L'insegnamento come pratica basata sull'evidenza. *Nuova Secondaria Ricerca*, 9, 108-113.

Trudeau F., Shephard R. J. (2008). Physical education, school physical activity, school sports and academic performance. *International journal of behavioral nutrition and physical activity*, *5*(1), 1-12.

Turvey K. (2018). Humanising as innovation in a cold climate of [so-called-evidence-based] teacher education. *Journal of Education for Teaching, 45*, 15-30.

Vicini M. (2017). *Istituzioni di scienze motorie*. Studium: Roma.

Viganò R. (2010). Challenge strategici ed epistemologici per la ricerca in educazione. *Education Sciences & Society*. 1, 91-100.

Viganò R. (2016). Ricerca educativa fra pratiche e politiche istituzionali. *Giornale della ricerca educativa*, IX, 16, 71-84.

Viganò R. (2019). Il rapporto tra ricerca e pratica educativa come oggetto di ricerca e di impegno. Contributi scientifici internazionali e questioni aperte. *Pedagogia Oggi*, 17(2), 342-354.

Wang Y., Chen A. (2020). Two Pathways Underlying the Effects of Physical Education on Out-of-School Physical Activity. *Research quarterly for exercise and sport*, *91*(2), 197-208. https://doi.org/10.1080/0270-1367.2019.1656325

Whitty G. (2006). Educational research and education policy making: Is conflict inevitable? *British Educational Research Journal*, 32, 2, 159-176.