

TRANSFER GOAL: REAL TASK IN PHYSICAL EDUCATION AS REPRESENTATIVE LEARNING ENVIRONMENT

OBIETTIVO TRANSFER: COMPITI DI REALTÀ IN EDUCAZIONE FISICA COME AMBIENTI DI APPRENDIMENTO RAPPRESENTATIVI

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Abstract

Over the past decade the scientific literature recognized the potentiality of physical education and sport for the integrated development of the person, highlighting the benefits on the different domains.

To achieve this, the participation in physical and sport activities alone is not enough, it is necessary to create quality learning environments with an adequate organizational structure supported by high-profile methodological-didactic skills of the practitioners.

This contribution focuses on the *transfer* process, that can and must be carried out so that the student can, through guided and representative experiences, be able to face the problematic situations of reality with a rational, creative, planning and critical attitude, reusing the knowledge, skills and competences acquired in training contexts.

Starting from an educational approach that frames the discipline of physical education as a methodological glue able to promote the overall development of the person, according to the ecological-dynamic approach and non-linear pedagogy in physical education, possible lines of methodological action-functional didactics to the design of representative learning environment able to favour the *transfer* process will be traced.

La letteratura scientifica degli ultimi decenni riconosce le grandi potenzialità dell'educazione fisica e dello sport per lo sviluppo integrato della persona, evidenziandone i benefici sui diversi domini. Perché ciò avvenga non basta la sola partecipazione alle attività motorie e sportive occorre creare ambienti di apprendimento di qualità con un assetto organizzativo adeguato e competenze metodologico-didattiche di alto profilo degli operatori.

Il presente contributo focalizza l'attenzione sul processo di *transfer* che può e deve realizzarsi affinché l'allievo possa, attraverso esperienze guidate e rappresentative, essere in grado di affrontare le situazioni problematiche della realtà con atteggiamento razionale, creativo, progettuale e critico, riutilizzando le conoscenze, abilità e competenze acquisite nei contesti formativi.

Partendo da un approccio educativo che inquadra la disciplina dell'educazione fisica come un collante metodologico in grado di promuovere lo sviluppo complessivo della persona, in linea con l'approccio

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ecologico-dinamico e la pedagogia non lineare in educazione fisica, verranno tracciate alcune possibili traiettorie metodologiche funzionali alla progettazione di ambienti di apprendimenti rappresentativi in grado di favorire il processo di trasferimento.

Key-words

Educational planning; physical education; representative environment; *transfer*.
Progettazione didattica, educazione fisica, ambiente di apprendimento rappresentativo, *transfer*.

Introduction

The ongoing change of the training paradigm, increasingly oriented longitudinally to the development of skills for life, underlines the need to consider development as a dynamic and non-linear process which, starting from birth based on personal and environmental characteristics, proceeds throughout the whole life cycle. During this long journey the individual is enriched by different ecological contexts that offer formal, informal and non-formal learning experiences; every cultural context creates opportunities for learning knowledge, skills and competences.

In this scenario, emerges the need to implement in the school context, as formal learning environment organized and structured, significant learning processes, able to create effective substrates for acquisition and development skills. The European Council in the new Recommendation on key competences for lifelong learning stresses the need to guarantee each person «a broad spectrum of skills and competences, to be developed continuously over the course of life (EU, 2018, p. 13).

According to the horizontal dimension of continuous training, which actually takes place in all areas and at any stage of life, the school must fulfill the important role of promoting the complementarity of formal, non-formal and informal learning (Galliani, 2012).

The different learning contexts are permeable to each other and the learning process will be all the more flexible and dynamic the more the school as a formal context of school education is able to implement training practices specific to the non-formal context or educational experiences derived from the informal context (Eraut 2000). For this reason, it is necessary to promote teaching that can integrate the different contexts enhancing the transversality and permeability of knowledge in a complementary perspective.

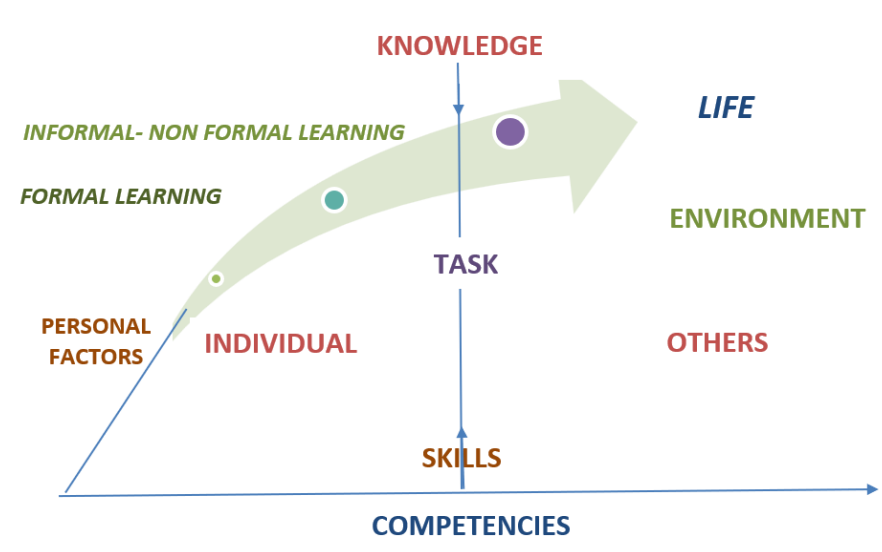


Fig.1: Longitudinal and horizontal perspective of skills development

As highlighted in fig.1, learning develops from the personal factors that distinguish the person, they evolve and are enriched thanks to the integration of the different training contexts. The central axis of formal education creates the preconditions in terms of knowledge, skills and competences for the individual to be able to face everyday life in a functional way.

The teaching approach based on competences, understood as the ability to respond to social needs or to effectively carry out an activity or a task, making use not only of cognitive skills, but also of attitudes, motivations, values, emotions (OECD, 2003) can respond to educational needs providing students with the keys to give value to experiences and promote the "cognitive flexibility" acquisition, that gives them the ability to know how to search for information, select it, analyse it, interconnect and make coherent the multiple educational experiences. The National guidelines (MIUR, 2018) underline the need to relate educational planning to real life. The student, a future citizen, must acquire these indispensable learnings that give him the necessary skills to be able to respond to the complexity of reality, through the analysis of problems, the adequate management of complex situations through cooperation and social learning, experimentation, investigation, contextualization in experience and laboratory work (MIUR, 2018, p. 16).

The school becomes a "workshop of experiences" creating opportunities and occasions to promote the development of skills through «stable and meaningful learning, with meaning and value for citizenship» (MIUR, 2018, p. 16). The vertical curriculum proceeds with this horizon of meaning also for the second cycle of instruction finalizing the educational, cultural and professional profile (PECUP) to the development of the autonomy of judgment and the exercise of personal and social responsibility. This profile, in continuity with the first cycle, emphasizes the transversal dimension of the different educational and training paths attended by the student, highlighting the importance of different learning (knowledge, conscious doing and acting) that at several levels create the conditions for the development of skills that allow the student to be autonomous in all fields of human, social and professional experience (MIUR, 2010).

All disciplines can contribute to the development of active citizenship, of that cognitive dimension that can guarantee students the skills to face the changes and challenges of their present and project themselves better into the future, becoming active and aware citizens. With the aim of orienting the curricula of schools, the ministerial note proposes some points of reflection to enhance the contribution of the different disciplines, highlighting the need to organize properly teaching. The reflection on the meaning of instruction and education must direct the choices of teachers towards the design of learning environments that encourage the acquisition of social, civic, metacognitive and methodological skills and competences.

Physical Education is defined as a discipline of "hinge" between the scientific, communicative and expressive, relationship and citizenship fields. There is an explicit invitation to orient motor and sports activities, within the curriculum, giving priority to an educational approach that is increasingly distant from the performative and health concept that has characterized for a long time the school reality of physical education in Italy. The promotion of healthy and correct habitus and lifestyles is a need widely recognized by international scientific studies, highlighted and supported by the national guidelines of 2012. It is necessary to frame the discipline through a holistic approach, which identifies among its main goals, the physical, personal and social development of young people, together with the promotion of a healthy lifestyle, assigning to physical education the role of a privileged instrument for the structuring of personality, social relations and for the acquisition of life skills, also with a view to the prevention and reduction of psychological and social problems.

The international and national regulatory framework reinforces the transversal dimension of the different learnings that at different levels create the conditions for the development of functional

skills to act consciously and independently in all fields of human, social and professional experience.

This scenario requires an innovative educational approach, able to apply the teaching principles suggested by the research and the scientific paradigms.

This contribution, starting from an educational approach that frames the discipline of physical education as a methodological glue capable of promoting the overall formation of the person, focuses on the design of representative or authentic learning environments.

The *Transfer* process becomes the pivot of the educational action, the *core* that guides the methodological and educational choices.

- How to design representative learning environments?
- How to create right conditions for an effective *transfer* process?

1. The *Transfer* process

Since the beginning of the '900, the *transfer* in learning has been the subject of study and deepening, albeit framed by different and quite heterogeneous perspectives. Despite recent research in the field of cognitive neuroscience, (Gallese et al., 1996; Le Doux, 1996; Schwartz & Begley, 2009) the issue still appears controversial.

A first definition tends to frame *transfer* as the ability to *transfer* and use knowledge or skills from one context to another, as well as from one subject to another and from one problem to another. If knowledge appears essentially as a *transfer* of previous knowledge and skills, the influence of previous learning can encourage or prevent subsequent learning» (Vignati, 2009). Polàcek (2005) defines *transfer* as a meta-ability that refers to the ability of the subject, in the field of knowledge to *transfer* skills, processes and structures acquired in one context and to use them in another similar or completely different from the one in which they were acquired. This definition highlights a higher cognitive level that ascribes the *transfer* to the group of metacognitive and self-regulatory abilities.

In the educational field and especially in the school context, these skills are the subject of great attention because they can promote the development of a cognitive flexibility that allows the student to effectively face complex situations, using previously learned conceptual and procedural connections with the necessary adaptations. «This means that the extent to which this *transfer* occurs provides the measure of the quality and success of learning» (Pea, 1987; Perkins & Salomon, 1992).

In this context it is not possible to make a survey on the different and multiform types of *transfer* identified in the literature that concern the object of the *transfer*: a content, a process, a category of knowledge, a motor ability, a response to a specific stimulus, orientation towards a task, etc. (Bereiter, 2005).

Haskell (2000) identifies two types of taxonomy to measure learning *transfer*: the first taxonomy defines six *transfer* levels, each of which specifies a precise degree of similarity between past and present knowledge; The second focuses instead on 14 different types of *transfer*, sometimes divided into two constituent categories: type of knowledge (*declarative, procedural, strategic, conditional and theoretical*) and specific type of *transfer*.

Some studies in schools have shown that the *transfer* process takes place when pupils have been prepared in a flexible way at the time of reflection on what they have assimilated. McKeough (1995) describes in his study the teaching methodologies that facilitate the long-term resolution of school and/or professional problems with an innovative and dynamic approach, enhance the potentialities of targeted design in this sense can be very effective. The

scientific framework is very wide and complex; there is a need for more scientific evidence that can exploit the educational effects in terms of improving the flexibility and solidity of learning.

2. Real tasks as representative learning environments

The general diction authentic task refers to a task assigned to students with the aim of promoting and at the same time evaluating the knowledge, skills and competences used in dealing with authentic and real problems (Glatthorn, 1999).

The authentic task has been variously interpreted: as "real task" or "real live task", "performance task", "expert task", "professional task" (Tessaro, 2014).

Regardless of the different denomination, the real tasks provide for the resolution of a problematic situation through the elaboration of a task/activity/product mobilizing all its knowledge, skills, metacognitive and methodological skills, personal and social skills (Da Re, 2013). They are, therefore, didactic paths finalized to the acquisition and to the development of transversal competences in a position to favour the process of generalization of the acquaintances, the abilities, the learned competences. Generalization, as long as it is so, must be able to emerge not only in learning environments specially created in the school context. The *transfer*, in fact, takes place when the student can apply, independently and responsibly, what he has previously learned in a real and concrete situation. A student may be able to respond and adapt himself adequately to a situation by adopting the right response to the stimulus when the situation, although different from the experienced one during the normal learning process, has common or similar characteristics respect to the latter. The process is positive when the student becomes able to discriminate the different inputs and recognize the *affordance* present within the environment in order to bring out the specific skill learned adapting it to the current situation.

The approach of nonlinear pedagogy, in the awareness of the complexity of human learning and the complex interactions between task, environment and individual (Newell, 1986; Davids et al., 2006), seeks to support physical education teachers in the planning of practical tasks/activities (Chow et al., 2007; Chow, 2021; Ovens et al., 2013). One of the guiding principles of non-linear pedagogy is the principle of the representativeness of the learning environment that takes up the concept of representative design defined by Brunswick (1956). The hungarian psychologist starting from the enhancement of the adaptive potentialities of psychological processes and the innate ability of self-organization and adaptation of the individual in response to inputs from the environment, he defended the idea that, to encourage the generalization of learning, the different variables of the task must be implemented in an ecological environment (*representative design*) as close as possible to the real situation. Several authors have experimented methodological approaches that emphasize the situated dimension of learning: the *Esperiential Learning* developed in adult education by Kolb (1984) the *Situated Learning*, learning model strongly linked to training systems organized in communities of practice (Lave & Wenger, 1991) the *Action Learning* proposed by Revans (1980) and *Situated Learning in Physical Education* (Kirk & Macdonald, 1998).

In the field of sport and physical education, methodological lines of action have been defined in recent years in line with the dynamic ecological approach (Davids, 2006) and the non-linear pedagogy (Chow, 2013) focused on the need for targeted design of learning environments with a *transfer* objective (Pinder et. al, 2011; Araújo & Davids, 2009).

In the specific field of sport this principle of representative design is adopted by coaches to implement practical tasks that are as close as possible to the competitive environment, because

the more a skill is performed and experienced in practice, the more it will emerge independently at the moment of competition. To implement this *transfer* process the coach must create conditions of play during training that are representative of a particular context of sports performance (Chow et al., 2011; Pinder et al., 2011). Fajen et al. (2009) believe that acting didactically on the representativeness of the environment, preparing tasks/activities with specific information or invitations for action (*affordance*), can foster the emergence of functional behaviours and facilitate tuning with key relationships. The principle of representativeness of the task can guide physical education teachers in the planning of learning environments that are able to promote the development of functional behaviours in practice (i.e. those that allow an effective and efficient resolution of a particular task/activity/problem). The extension of this principle from the purely sporting field, aimed at improving technical performance, to the development of key competences for lifelong learning (EU, 2006; 2018), allows to enhance the multidimensionality of physical education in the school context promoting the implementation of learning environments located and embodied in which the different dimensions of personality (cognitive, affective-relationship, communicative, emotional, ethical) are systemically involved.

For the realization of training courses in line with this educational perspective, it is necessary to value the laboratory, cooperative and constructive dimensions of learning; central and peculiar dimensions of physical education. The learning environment that distinguishes the specific activities of the discipline is characterized by the *operational* and *community* dimension of learning that well integrates the operational-motor aspects with those of communicative-relational, involving actively the student and promoting conscious learning processes in practical contexts that are motivating and satisfying.

In order to create learning environments that can facilitate the transfer process and calibrate the level of representativeness of the task/activity you need:

- to provide for the use of different instructions by changing conditions and/or situations while maintaining the same objective;
- to create opportunities to generalize learning even among different teachers/educators and in different contextual conditions;
- prioritising functional skills;
- to gradually modify the inputs, making small changes to previous skills learned;
- to reinforce previous skills learned;
- to recall previous skills even at times of non-central activity;
- to offer opportunities to use a certain behaviour acquired in other contexts or different situations (increasingly representative tasks);
- to encourage opportunities for the use of acquired skills and/or behaviour in every moment of the day.

The fig. 2 summarizes schematically how the level of transferability of knowledge, skills and competences and the level of representativeness of the learning environment can be calibrated by modifying several teaching variables.

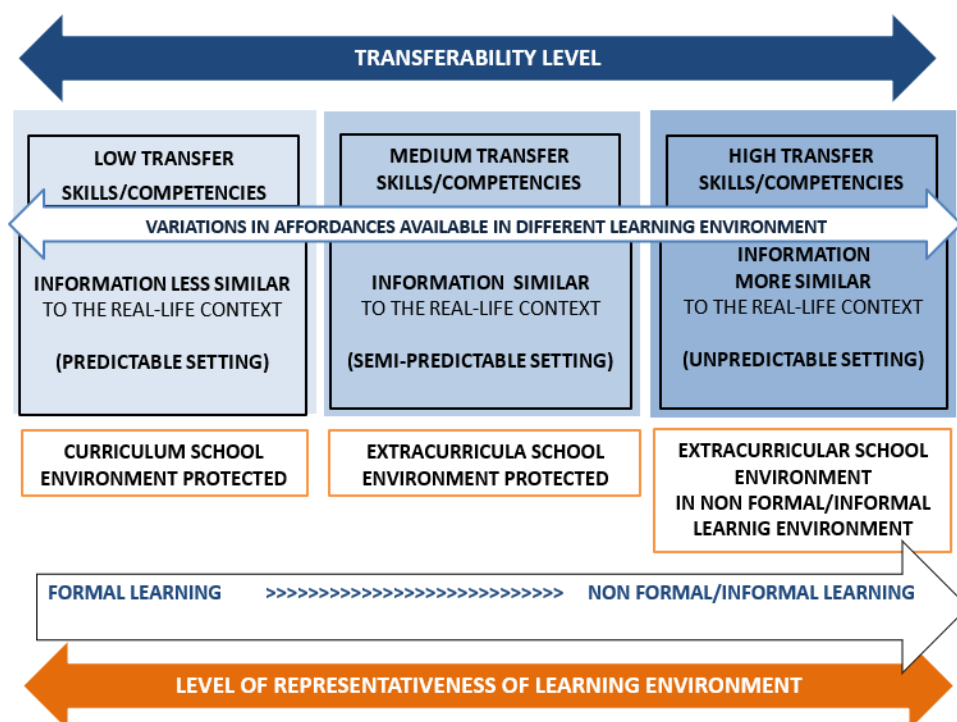


Fig.2: continuum of representativeness

In the ex-ante phase teacher must modulate his teaching action along the following lines of action: a) to adopt *teaching styles* that can promote schemes of actions, mental habits useful for the development of basic cognitive skills (understanding, processing, storage, etc.) and creative thinking through educational mediation (Mosston & Ashworth, 2008; Colella, 2018); b) to promote the development of *metacognitive strategies* (Bransford et al, 1999; Brown et al., 1983; Veenman et al., 2006) aimed at cognitive processes (planning, design, self-control, self-regulation, etc.); c) to favour *cooperative learning* (Slavin, 1980) that creates opportunities for interaction, comparison, communication, collaboration, etc. ; d) to modulate available *affordances* (Gibson, 1979;) functional to the acquisition of shares, behaviours, abilities, etc.

Tab. 1: Areas of metacognitive intervention – examples of possible stimulus questions

PERCEPTIONS 1 - to make perceive the strengths and weaknesses of the problem situation and their perceived difficulties in relation to the latter Where do I feel in trouble?	ATTRIBUTION OF ERROR 2- ability to objectively analyse errors to prevent feelings of failure Why did I react like that?
CRITICAL EVALUATION 3 - personal forecasting skills by putting in relation to their performance and the level of difficulty of the task. What do I expect?	PLANNING 4 - ability to plan the actions to be carried out adequately in relation to the objective/s of the task/s How do I proceed?
CONTROL AND SELF-REGULATION 5 - ability to monitor the process carried out with actions of control, adaptation and self-regulation in progress I acted in this way but if I had acted in this other one?	SELF-ASSESSMENT 6 - self-assessment ability of the path with critical reflection of improvements in relation to the starting situation How much better did I get and how much better could I get?

Conclusions

The design of *real tasks* allows to respond to the training needs of students following their interests, creating motivating opportunities for experience; promotes the development of metacognitive processes capable of promoting a conscious and autonomous "acting"; allows you to carry out an authentic assessment and self-assessment based on the feedback received in and from the learning environment.

The activities and the various practical tasks proposed during the training course, in addition to pursuing the specific objective of developing metacognitive skills by testing the ability of students to use all their resources in terms of attitude, responsibility and autonomy, allow to systematically observe behaviours and skills and to evaluate the skills acted by the students in the required performance.

The monitoring of the learning process, through specific evaluation programs, allows the acquisition of specific information (indicators) of the different dimensions of competences activated during the real task and at the same time allows to analyse the progress of the didactic processes implemented in order to remodulate the didactic action. Teacher and pupil become co-stars of the teaching-learning process: the first involved in a quality educational design aimed at creating the conditions for each student to experience increasingly realistic learning situations by offering inputs capable of generating potential performance solutions; the second involved in the manifestation of its needs, interests, motivations, (substrate from which teachers will develop the action of teaching), in the active participation and autonomous resolution of the task.

In view of the great potential of physical education, there is a need to activate a series of actions that involve the world of research and the institutional world: improving the professional skills of teachers through continuous training, implement action-research and study experiences experimenting with new and current models of "non-linear" educational design, create synergies and educational opportunities of complementarity between different learning contexts.

References

- Araújo, D., & Davids, K. (2009). Ecological approaches to cognition and action in sport and exercise: Ask not only what you do, but where you do it. *International Journal of Sport Psychology*, 40, 5–37.
- Bereiter, C. (2005). *Education and mind in the knowledge age*. Routledge.
- Bransford, J. D., & Schwartz, D. L. (1999). Chapter 3: Rethinking *transfer*: A simple proposal with multiple implications. *Review of research in education*, 24(1), 61-100.
- Brown, A.L., Bransford, J.D., Ferrara, R.A., & Campione, J.C. (1983). Learning, remembering, and understanding. In J.H. Flavell, and E.M. Markman (Eds.), *Handbook of child psychology: Vol. 3. Cognitive Development* (4th ed., pp. 77–166). New York: John Wiley and Sons.
- Brunswick, E. (1956). *Perception and the representative design of psychological experiments* (2nd ed.). Berkeley: University of California Press.
- Chow, J. Y. (2021). Nonlinear Pedagogy: A New Framework for Designing Learning Environments for Sport, Physical Education and Recreational Activities. In *Nonlinear Pedagogy and the Athletics Skills Model* (pp. 75-90). Routledge.
- Chow, J.Y. (2013). Nonlinear Learning Underpinning Pedagogy: Evidence, Challenges, and Implications. *Quest* 65: 469– 484.
- Chow, J.Y., Davids, K., Button, C., Shuttleworth, R., Renshaw, I., & Araújo, D. (2007). The role of nonlinear pedagogy in physical education. *Review of Educational Research*, 77(3), 251-278.

Colella D. (2018). Physical Literacy e stili d'insegnamento. Ri-orientare l'Educazione Fisica a scuola. *Formazione & Insegnamento*, XVI, 1, 33-42.

Da Re, F. (2013). *La didattica per competenze: apprendere competenze, descriverle, valutarle*. Pearson.

Davids, K., Button, C., Araújo, D., Renshaw, I., & Hristovski, R. (2006). Movement models from sports provide representative task constraints for studying adaptive behaviour in human movement systems. *Adaptive Behaviour*, 14, 73-95.

Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British journal of educational psychology*, 70(1), 113-136.

Gallese V. Fadiga, L. Fogassi L. & Rizzolatti G. (1996). Action Recognition in Premotor Cortex. *Brain*, 119 (2), 593-609.

Galliani L. (2012) Apprendere con le tecnologie nei contesti formali, non formali e informali. In Limone P. (Ed) *Media, tecnologie e scuola: per una nuova Cittadinanza Digitale*. Bari:Progedit

Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin.

Glatthorn, A. A. (1999). *Performance standards and authentic learning*. Eye on Education.

Haskell, R. E. (2000). *Transfer of learning: Cognition and instruction*. Elsevier.

Kirk, D., & Macdonald, D. (1998). Situated learning in physical education. *Journal of Teaching in Physical education*, 17(3), 376-387.

Kolb, D. (1984). *Experiential Learning: experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall.

Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.

LeDoux, J. (1998). *Il cervello emotivo. Alle origini delle emozioni*, Milano, Baldini Castoldi Dalai.

McKeough, A., Lupart, J., & Marini, A. (Eds.). (1995). *Teaching for transfer: Fostering generalization in learning*. Lawrence Erlbaum Associates, Inc.

MIUR (2010). Indicazioni nazionali riguardanti gli obiettivi specifici di apprendimento concernenti le attività e gli insegnamenti compresi nei piani degli studi previsti per i percorsi liceali.

MIUR (2012). *Indicazioni nazionali per il curricolo per la scuola dell'infanzia e del primo ciclo di istruzione*.

MIUR (2018). *Nazionali e Nuovi Scenari*, Comitato Scientifico Nazionale per le Indicazioni 2012 della scuola dell'infanzia e del primo ciclo di istruzione.

Mosston M. & Ashworth S. (2008). *Teaching physical education*. First on line edition.

Newell, K. M. (1986). Constraints on the development of coordination. In *Motor development in children. Aspects of coordination and control*, ed. M.G. Wade and H.T.A. Whiting, 341-60. Dordrecht The Netherlands: Martinus Nijhoff.

Organizzazione delle Nazioni Unite per l'Educazione, la Scienze e la Cultura (2015). *Trasformare il nostro mondo: l'agenda 2030 per lo sviluppo sostenibile*.

Ovens, A., Hopper, T., & Butler, J. (2013). Complexity thinking in physical education. *Routledge Studies in Education and Youth Sport*. Routledge: Taylor & Francis Group.

Parlamento Europeo e Consiglio Europeo (2018). *Raccomandazione sulle Competenze chiave per l'apprendimento permanente*, del 22 maggio 2018.

Parlamento Europeo e Consiglio Europeo. Raccomandazione del parlamento europeo e del Consiglio del 18 dicembre 2006 relativa a mobilità transnazionale nella Comunità a fini di istruzione e formazione professionale Carta europea di qualità per la mobilità (2006/961/CE).

Pea, R. D. (1987). Socializing the knowledge transfer problem. *International Journal of Educational Research*, 11, 639-663.

Perkins, D. N., & Salomon, G. (1992). *Transfer of learning*. *International encyclopedia of education*, 2, 6452-6457.

Pinder, R., Davids, K., Renshaw, I., & Araujo, D. (2011). Representative learning design and functionality of research and practice in sport. *Journal of Sport & Exercise Psychology*, 33(1), 146-146.

Polàcek, K. (2005). *Questionario sui Processi di Apprendimento*. Firenze: Organizzazioni Speciali. Raccomandazione del consiglio dell'Unione Europea del 22 maggio 2018 relativa alle competenze chiave per l'apprendimento permanente (2018/C 189/01).

Revsans, R. (1980). *Action learning: new techniques for management*. London: Blond & Briggs.

- Schwartz, J. M., & Begley, S. (2009). *The mind and the brain*. Springer Science & Business Media.
- Slavin, R. E. (1980). Cooperative learning. *Review of educational research*, 50(2), 315-342.
- Tessaro, F. (2014). Compiti autentici o prove di realtà. *Formazione & Insegnamento* XII, 3, pp.77-87.
- Veenman, M. V., Hout-Wolters, V., Bernadette, H. A. M., & Afflerbach, P. (2006). Metacognition and learning: Conceptual and methodological considerations. *Metacognition and learning*, 1(1), 3-14.
- Vignati, R. (2009). Il *transfer* cognitivo nei processi di apprendimento: un paradigma del cambiamento e della creatività? In *Psico-in*. Informazione dell'Ordine degli Psicologi delle Marche. Anno XV, 2, 11, 15-19.