European Commission

EU Work Plan for Sport 2014-2017

Expert Group on Health-enhancing physical activity

Recommendations to encourage physical education in schools, including motor skills in early childhood, and to create valuable interactions with the sport sector, local authorities and the private sector

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Sport

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1. Introduction

In the White Paper on Sport (2007), the European Commission recognised that the time spent in physical education and extra-curricular sport activities are vital to children's education and health. Both are crucial instruments to promote their physical, cognitive, social and cultural development.

The European Union (EU) Guidelines on Physical Activity (2008) highlight that the decline in physical activity and the concomitant increase of the time spent in sedentary behaviours observed among children in Europe represent an enormous threat, which is responsible for several physical, metabolic and mental comorbidities, during youth and later life[1,,23].

The low levels of physical activity among children and adolescents in the EU are alarming and have become a matter of great concern for policy makers. The educational environment plays a particularly important role in this context. It has been estimated that about 80% of school-age children only practice physical activity and sport in school[4]. The school must, therefore, be considered unique, since it is the only institution that can help all children to achieve, whether through formal curriculum (physical education classes) or through extra-curricular sport and physical activities, the World Health Organization's recommendations on physical activity for young people. It has been recognised that special attention should be given to the education sector and its relevant role in health-enhancing physical activity (HEPA) promotion during childhood and adolescence. Schools, and physical education in particular, play a key role in ensuring that every child has an opportunity to develop fully his/her cognitive, social and physical potential.

At the EU level, the first EU Work Plan for Sport (2011-2014)[5] highlighted the need for further action to promote HEPA. The Council Recommendation of November 2013 on promoting health-enhancing physical activity across sectors[6] invited Member States (MS) to develop cross-sectoral policies and integrated strategies involving sport, education, health, transport, environment, urban planning and other relevant

[1] Martinez-Gomez D, Tucker J, Heelan K, Welk GJ, Eisenman JC. Associations between sedentary behavior and blood pressure in young children. Arch Pediatr Adolesc Med. 2009; 163(8): 724-730.

[2] Tremblay MS, LeBlanc AG, Kho ME, Saunders TJ, Larouche R, Colly RC, Goldfield G, Gorber SC. Systematic review of sedentary behaviour and health indicators in school-aged children and youth. Inter J Behav Nutr Phys Activity. 2011; 8: 98.

[3] Katzmarzyk PT. Physical activity, sedentary behaviour and health: paradigm paralysis or paradigm shift? Diabetes. 2010; 59: 2717-2725.

[4] Woods CB, Tannehill D, Quinlan A, Moyna N & Walsh J (2010). Children's Sport Participation and Physical Activity Study (CSPPA). Research Report No 1. School of Health and Human Performance, Dublin City University and Irish Sports Council, Dublin, Ireland. https://www4.dcu.ie/shhp/downloads/CSPPA.pdf

[5] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:42011Y0601%2801%29

[6] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32013H1204%2801%29

society sectors.

Likewise, the second EU Work Plan for Sport (2014-2017)[7] gave priority to HEPA promotion and identified additional actions for the Member States (MS) and the Commission to promote HEPA. It mandated the Expert Group on Health-enhancing physical activity (XG HEPA) to produce recommendations *to encourage physical education in schools, including motor skills in early childhood, and to create valuable interactions with the sport sector, local authorities and the private sector*.

From a legal perspective, article 165 of the Lisbon Treaty provided the basis to support and frame action in the field of sport, recognising the educational and social relevance of sport in European societies. When promoting EU sporting issues and considering the mandate of the XG HEPA, relevant aspects should be taken into account, such as the quality of the physical education programmes in all MS, the taught time allocated to physical education and to other extra-curricular activities, the physical education teachers' qualifications, and the national strategies adopted in this context. The Eurydice Report – Physical Education and Sport at School in Europe[8] looked carefully into some of those aspects. Along with its conclusions, scientific evidence and the recently published UNESCO report "Quality physical education guidelines for policy makers"[9] were used by the XG HEPA to support the development of the present recommendations.

MS are encouraged to take these recommendations into consideration when defining new national strategies and curricular reforms to promote quality physical education, physical activity and sport participation among young people.

[7] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:42014Y0614%2803%29

[8] European Commission/EACEA/Eurydice, 2013. Physical Education and Sport at School in Europe Eurydice Report. Luxembourg: Publications Office of the European Union.

[9] http://www.unesco.org/new/en/social-and-human-sciences/themes/physical-education-and-sport/quality-physical-education/policy-project/

2. Recommendations to encourage physical education as from early childhood

The early life period, from birth, assumes a fundamental role to acquire and improve motor skills[10,11], neuromotor capacities and healthy behaviours[12]. During this period, the lack of appropriate physical and cognitive stimulation may lead to irrecoverable deficiencies or delays that will affect personal development and achievements throughout life. Participation in physical activity should, therefore, be promoted as from very early childhood with the aim of developing neuromotor skills, physical, psychological and social skills.

The academic and social relevance of physical education is acknowledged in Europe, being included in the formal curriculum in both primary and secondary education. This fact demonstrates the political commitment to physical education and sport across MS. According to the Eurydice report[13], despite the fact that only half of the MS established national strategies to develop physical education, about two-thirds refer to the existence of large-scale national initiatives involving this sector.

Physical education and extra-curricular activities provide special environments to develop physical, technical and tactical skills, to ensure the enjoyment of playing different activities, games and sports, and to promote lifelong fitness and good health through the recognition of the numerous values associated with the activities performed.

After graduating from secondary level schools, young people should still be targeted and helped to maintain their healthy lifestyles through participation in regular exercise programmes or sport at the tertiary level (international standard classification of education levels 5 to 8). Universities, in particular, are considered important contexts for the promotion of HEPA.

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[10] Fischer KW. A theory of cognitive development: The control and construction of hierarchies of skills. Psychological Review, Vol 87(6), Nov 1980, 477-531.

[11] Myer GD et al. Training the developing brain, part I: cognitive developmental considerations for training youth. Curr Sports Med Rep. 2013 Sep-Oct; 12(5):304-10.

[12] Halfon N & Hochstein M. Life course health development: an integrated framework for developing health, policy, and research. Milbank Q. 2002; 80(3):433-79, iii.

[13] European Commission/EACEA/Eurydice, 2013. Physical Education and Sport at School in Europe Eurydice Report. Luxembourg: Publications Office of the European Union.

Recommendation 1 – Physical activity should be promoted from birth and throughout the life course, at all educational levels: early childhood, primary, secondary education, and tertiary level. The pre-school and school environments play a key role in the development of physical education and promotion of physical activity and sport.

2.1 Physical literacy and fundamental motor skills to be promoted before any school setting

From birth, motor skills are potentially part of each child. They must be stimulated to blossom out through situations, contexts and opportunities where children can explore their body and their environment, try out and consolidate their own motor potential. Regarding the importance of building up healthy attitudes and habits from the beginning, it is necessary not to miss opportunities to encourage motor stimulation and promotion in earliest childhood. Fundamental motor skills and physical literacy should be encouraged by all persons and institutions dealing with very young children before compulsory school.

The first very important persons to create such opportunities and to let very young children discover their own world are parents and grandparents. Advice and help, including local community based programmes should be offered to parents to ensure that they can create favourable home environments. They should be aware of the importance of this topic and encourage children's motor development.

In our society, young children, even before attending preschool settings, spend a lot of time in day-care institutions. These organisations can offer precious opportunities to give children more time to move and play, both in natural active play and organized activities. Physical activity and motor promotion must also be part of the responsibilities of these day-care institutions. If those are under public control or co-funded by public budgets, physical activity programmes should be mandatory. For private day-care institutions physical activity programmes should be highly recommended. An EU label could help to raise awareness for the topic of physical activity and motor skill promotion.

Preschool settings, parallel or following on from day-care institutions, despite not always having a formal physical activity or motor skill curriculum, should offer daily physical activity and moving opportunities. Physical activity and motor promotion must be a mandatory part of preschool institutions on a daily basis. Again, an EU label

could help to raise awareness for the topic of physical activity and motor skill promotion.

To encourage and facilitate the development of motor skills in early childhood physical activity friendly environments, age adapted programmes and activities, teachers and educators in preschool and day-care institutions with training in physical activity organization and teaching are necessary to fulfil motor promotion in these settings.

Recommendation 2 – All those in charge of children from birth and through early childhood should be aware of the important role they have in starting an educational process for motor development and physical activity. Parents, educators in day-care settings, and teachers in pre-schools should be assisted to develop their knowledge and knowhow for this topic, especially for sensorimotor learning and active play. Community-based programmes should be developed and offered to parents, educators and teachers.

2.2 Physical education curricular content

In early childhood education, physical activity should include daily natural active play, enjoyable games, participation in physical activity and sports which could be supported by music or storytelling. Along with the learning dimension, fun should be also prioritised in both physical activity and physical education context. Being physically active should be enjoyable and a natural part of any child's day. Willingness and desire to learn and participate will always increase if the activity is enjoyable to children.

During primary and secondary education, physical education should include a broad variety of different games, physical activities, and sports to maximise children's experiences and opportunities to develop personal motor skills, abilities or individual's interests.

Recommendation 3 – From birth and during early childhood, physical education should include daily active play, enjoyable games, and sports aiming to develop core neuromotor skills, physical, psychological, and social attributes. In primary and secondary education, physical education should include a broad variety of different games, dance, sports, and physical exercises. Physical activity at school and physical education should be fun and enjoyable to maximise children's willingness and desire to learn and participate.

While some MS present mandatory activities that are addressed by physical education, in several others, schools have the autonomy to choose major physical education curriculum activities. Very few MS present a mixed model where mandatory activities coexist with school autonomy, although it may better adjust national goals to local community realities.

Children and young people are able to develop their physical abilities such as speed, endurance, balance, strength, suppleness, coordination and agility through different types of activities adapted to their capacities. The different gender-typical maturation status, especially until middle adolescence ages, implies that several mandatory physical activities should be precisely introduced according to the age in order to develop each of the neuromotor abilities and skills when they can be best developed[14].

Recommendation 4 – The physical education curriculum content should include physical activities according to maturity phases taking into account the favourable periods that allow the full development of neuromotor abilities and skills.

It has been recognised that school physical education and physical activity can play an important roles in the prevention of several epidemic comorbidities such as overweight and obesity, diabetes mellitus, and cardiovascular diseases[15,16,17]. More recently, research suggests that low levels of sport and outdoor activity increase the odds of becoming myopic, a phenomenon reaching epidemic proportions among

[14] Balyi I, Way R, Higgs C. Long-Term Athlete Development. Human Kinetics Edts. 2013.
[15] Candeias V et al. Diet and physical activity in schools: perspectives from the implementation of the WHO global strategy on diet, physical activity and health. Can J Public Health. 2010; 101, Suppl 2:S28-30.
[16] World Health Organization. Global status report on noncommunicable diseases 2014. January 2015. http://www.who.int/nmh/publications/ncd-status-report-2014/en/
[17] Matheson GO et al. Prevention and management of non-communicable disease: the IOC consensus statement, Lausanne 2013. Br J Sports Med 2013;47:1003-1011 doi:10.1136/bjsports-2013-093034

youth in several world regions[18]. It is estimated that children need to spend around three hours per day under natural light to be protected against myopia. Physical education classes can contribute to this need to spend sufficient time outside. Moreover the objective of physical education for children and young people should also be to instil lasting habits of moving regularly in outdoor settings, such as natural parks.

Recommendation 5 – Outdoor physical activities and sports should be promoted at all education levels. Along with extra-curricular activities, the physical education curriculum should instil lasting habits of moving regularly in outdoor settings.

Physical education transcends physiological, recreational and competitive dimensions, being also responsible for the transmission of several important ethical principles and concepts such as fair play, perseverance, cooperation, equity, social cohesion, peace, respect of other's capabilities, and both body and social awareness. These values are important pillars to guide the interpersonal interaction and teamwork and, contribute to enhancing personal development and social skills. Extra-curricular physical activities can also play a role in developing these skills and promoting the values transmitted by physical education. By doing so, extra-curricular physical activities can help to prepare future societies that are based on the values of peace, human rights, inclusion, co-operation, solidarity and justice.

Recommendation 6 – Physical education and extra-curricular activities should foster an ethical education by teaching values such as fair play, cooperation, equity, equality, integrity, peace, human rights, and respect of others' capabilities. Through sport participation, they should also develop relevant skills such as teamwork, social inclusion and leadership, avoiding sport stereotypes.

During childhood and adolescence, school and family are the cornerstones of the teaching-learning process, supporting multi-dimensional personal and social developments. Physical education guidance documents should emphasize the promotion of children's physical, social and personal development, and their awareness for healthy lifestyles.

In some MS health education is a mandatory stand-alone school subject included in the compulsory curriculum. In almost all MS, health education concepts such as

[18] Dolgin E. The myopia boom. Nature. 2015; 519: 276-278.

personal and social well-being, health and illness prevention, hygiene, food and nutrition have been developed in the context of other subjects like biology and social sciences. In certain MS, some of these topics are also included within the physical education curriculum.

The physical education curriculum should cover the topic of healthy lifestyle from a broad perspective, beyond the practice of physical activities, in close cooperation with other school disciplinary groups. Physical education classes should usefully instil and promote healthy habits and behaviours, like using stairs instead of elevators, walking and cycling, as well as discouraging excessive television and computer gaming and, instead, promoting "active" games for times when children cannot play outside.

Recommendation 7 – The physical education curriculum should include health education concepts like personal and social well-being, health promotion, and healthy lifestyles from a broader perspective beyond the practice of physical activity and sport. Physical education teachers should also cooperate closely with other disciplines in school to fully develop these concepts among the education community.

2.3 Inclusive approach

Physical activity is important for all children regardless of age, gender, ethnicity or social background. Everyone should be able to participate in the activities proposed, including less active and less skilled children, in order to prevent negative experiences resulting from inadequate practice environments and approaches.

In addition, children with disabilities or special educational needs should not be set aside. Physical education teachers should adjust the activities, following the advice from professionals with experience in physical activity and disability.

Recommendation 8 – Everyone should be able to participate in physical education and extra-curricular activities through inclusive, differentiated and adapted methodologies and activities, including less active and less skilled children. Children with a disability or special educational needs should be offered adapted activities and not be excluded.

2.4 Injury prevention

Physical activities and sport are essential parts of a healthy lifestyle. But, of course, participation in some of these activities also holds a risk. Although the relative health gains resulting from regular physical activity exceed the risk of injury, the burden of injuries related to sport and physical activities is substantial. About one in five injuries treated at emergency departments in hospitals is related to sport activities[19].

Fortunately, there are many possibilities to prevent these injuries, for instance by making sport infrastructures and equipment safer, prescribing the use of protective equipment, adapting rules of the game, programming systematically warm-up sessions and by making injury prevention a core component in physical education, and educating physical education teachers and coaches accordingly. Safety promotion objectives should, therefore, be integral part of physical education.

Recommendation 9 – Planned and well-designed physical education classes should integrate safety strategies and prevention measures in order to reduce the odds of injury and improve risk management.

2.5 Physical education taught time

More recently, scientific literature has also shown that physical activity and sport participation is closely associated with school results, evidencing a positive impact in cognitive development[20], behaviour, and psychosocial outcomes[21]. In fact, several studies have demonstrated that higher levels of cardiorespiratory fitness and motor skills development are associated with better academic performance, cognitive functioning and memory[20-22]. Another important review[23] has also identified that achieving an adequate quantity and quality of physical activity is necessary to

[19] EuroSafe, Policy Briefing "Promoting Safety in Sport: how to put actions in place".

[20] Haapala EA. Cardiorespiratory fitness and motor skills in relation to cognition and academic performance in children – a review. J Hum Kinet. 2013; 36: 55-68. doi: 10.2478/hukin-2013-0006.

[21] Lees C, Hopkins J. Effect of aerobic exercise on cognition, academic achievement, and psychosocial function in children: a systematic review of randomized control trials. Prev Chronic Dis. 2013; 10: E174. doi: 10.5888/pcd10.130010.

[22] Chaddock-Heyman L et al. III. The importance of physical activity and aerobic fitness for cognitive control and memory in children. Monographs of the Society for Research in Child Development. 2014; 79(4): 25.

[23] Khan NA, Hillman CH. The relation of childhood physical activity and aerobic fitness to brain function and cognition: a review. Pediatr Exerc Sci. 2014; 26(2): 138-46. doi: 10.1123/pes.2013-0125. Epub 2014 Apr 10.

maintain aerobic fitness during childhood and should be defined as a critical guideline to ensure physiological and psychological health.

In this context, the Physical Activity Guidelines published by the World Health Organization[24] clearly stress that every child and young person (5-17 years) should engage in at least one hour of moderate to vigorous intensity physical activity every day to ensure physiological and psychological health benefits. This activity should be mostly aerobic, and include muscle and bone strengthening activities, at least, 3 times per week.

Schools have a vital role to play in providing the opportunities to be active and to achieve the recommended guidelines. However, the Eurydice report has identified huge differences between MS regarding the minimum taught time in physical education. During compulsory education, the taught time seems to be low and present little variations, corresponding to 50-80 hours a year (i.e., ~ 1.5-2.5 hours per week).

The physical education taught time in primary and secondary education has been stable during the last 5 years, representing a very small percentage (about 10%) of the total taught time and about 50% of the time devoted to mathematics. In order to overcome this lack of physical education taught time, some MS (e.g. Hungary) have recently adopted new strategies to implement at all education levels a compulsory physical education taught time of about 5 lessons per week (i.e. close to the time allocated to mathematics or native language), thereby reinforcing the opportunities to be active and closing the gap to the levels recommended by the WHO. Denmark adapted a similar solution of 5 lessons per week of 45 minutes each, including physical education taught time and physical activity developed in other school disciplines.

All MS should be encouraged to follow these examples and increase physical education taught time to at least 5 lessons per week during compulsory education period. An increase in minimum physical education taught time may require adjustments in the curriculum structure and goals and would aim at realistic activities allowing teachers to address student needs at an appropriate pace.

[24] http://www.who.int/dietphysicalactivity/factsheet_young_people/en/

Recommendation 10 **-** The minimum physical education taught time recommended during compulsory education period should be increased to at least 5 lessons per week (~ 5 hours). The physical education curricular structure and goals should be adjusted accordingly, defining tangible and flexible outcomes for each developmental stage, and suggesting the inclusion of realistic activities.

2.6 Exemptions from physical education

Exemptions from physical education present another important issue that concerns all of those involved in the school community. The reasons to justify temporary or permanent exemption from the proposed activities are usually health-related. MS differ regarding exemption procedures; while some MS require a medical certificate attesting the inability to participate, other MS accept written requests from parents or other teachers. Whatever model is adopted, schools and physical education teachers should analyse the exemption requests, in order to understand the underlying reasons, and involve parents as appropriate. Creative ways of accommodating the concerns should be explored so as to create the conditions to increase children participation in the activities.

Recommendation 11 – Physical education is a necessary part of school curriculum, and exemptions should only be granted in extraordinary circumstances. In most cases, participation should be ensured with the use of inclusive, differentiated and adapted activities.

2.7 Assessment in physical education

Personal progress, results and achievements are assessed in physical education classes in most of MS, both through summative and formative assessment methods. During primary education, this assessment mostly relies on qualitative approaches. However, summative methods are commonly used, similarly to other compulsory school disciplines.

There is a need to make students aware of expectations regarding learning and learning outcomes. The latter should be tangible and adjusted for each developmental stage. Students should be able to understand how particular skills acquired in physical education classes enhance their capacities to learn and are applicable in

their lives outside sport and recreation.

Effective and regular feedback is considered a very powerful tool to help improve student outcomes[25]. Tracking learning during the teaching process should be among the daily responsibilities of physical education teachers.

Several MS have tried new successful approaches by using progress and achievements scales rather than quantitative physical results, which should be considered by MS authorities.

Recommendation 12 – Physical education should consider the possibility of including evaluation based on personal progress and achievements to complement both formative and summative methods. physical education teachers should provide effective and regular feedback, within defined learning outcomes.

2.8 Physical education teachers

Physical education teachers are key agents for putting physical and sport policies into practice. In the European Union, both generalist and specialist (with a Bachelors or Masters Degrees) teachers are giving physical education classes. In pre-school and primary education level, schools usually pursue a single-teacher model, where non-specialist teachers are allowed to teach physical education. In such cases, it is considered beneficial, as a minimum that qualified physical education teachers' mentor and support general teachers. In secondary education, a Masters degree is usually required from specialist physical education teachers. Physical education teachers should be role models and should be physically active as well.

Recommendation 13 – Qualified and specialised PE teachers should be preferred at all educational levels. When not possible, as a minimum, qualified PE teachers or certified coaches should counsel and support general teachers.

Continuous professional development is normally available to physical education teachers, thereby facilitating interaction with other disciplines. High quality training opportunities should always be ensured to allow physical education teachers to

[25] Hattie J, Visible Learning For Teachers – maximising impact on learning, 2012

expand their knowledge in relevant themes, such as new motor skills and sports, and health-enhancing physical activity, in order to improve the quality of their provision. Initial physical education teacher education should be constantly adapted to include such relevant topics, and also results from recent research and new learning approaches.

Recommendation 14 – National education coordinating bodies should promote quality changes in the training curricula of physical education teachers, both in initial formation and continuous education, in order to improve and expand those teachers' knowledge and competences in a variety of relevant subjects.

2.9 Monitoring of physical education

Monitoring the assessment or evaluation of physical education is legally required in most MS. However, it may be carried out irregularly or infrequently and there may be either no administrative system in place or there is a shortage of appropriately qualified/experienced personnel to facilitate the process[26]. Monitoring inspections is usually undertaken by teachers, local or regional or national inspectors or, most commonly, by a combination of these groups. Where monitoring occurs, its rationale is generally quality assurance and advice/guidance. It is considered important that MS develop the necessary conditions to ensure physical education classes' quality and curriculum compliance.

Recommendation 15 – National education coordinating bodies and schools should support the development and implementation of methods to ensure the compliance with and the high quality of the physical education curriculum.

2.10 Extra-curricular activities and activities outside physical education curriculum

In most MS, extra-curricular activities, focusing on participation in sport competitions, physical activities, games and events complement the physical education curriculum. Offering a broad variety of extra-curricular activities is useful to increase choice for children and adolescents. In many MS there are good examples

[26] UNESCO, World-wide Survey of School Physical Education – Final Report 2013

to illustrate how such activities can be included into the daily school routine like active breaks or activities on the way to school (such as active transport). Schools, alone or accompanied by other relevant organisations, should be responsible for the coordination of these activities.

In general, it is considered that more can be done. The extra-curricular activities offer should be increased to encompass a variety of activities ranging from the recreational context (e.g., healthy breaks, physical activities and games) to the competitive context (e.g., different contexts such as recreational physical activities and games, competitive sports). Schools and tertiary level institutions, such as universities, could be encouraged to participate in inter-scholar and inter-universities sport competitions, to organise sport/physical activity afternoons or holidays sport camps. Students in secondary school and tertiary institutions should be encouraged to take part in these after-school physical activity opportunities.

Recommendation 16 – Schools, alone or accompanied by other relevant organisations should promote and increase the availability of physical activities outside physical education curriculum (e.g. physical activity and sport, active breaks) including the implementation of the active school concept.

3. Valuable interactions between schools and the sport sector

As explained previously, physical education and extra-curricular activities play a pivotal role in increasing physical activity participation and in promoting the adoption of healthy lifestyles among children and adolescents. Extra-curricular activities usually pursue similar goals as those specified in the physical education curriculum, but their main purpose is to broaden and complement the opportunities for young people be more physically active. They should be included in the school remit, and must take into consideration the individual needs and interests of young people at school, reflecting cultural, geographical, financial, and several other conditions involving schools.

Sport organisations also play a vital role to address these challenges, as partners to complement the activities of schools, reinforcing the relevance of cooperation and complementarity as strategic values. The beneficial relationship between these partners should be promoted and publicly highlighted to strengthen valuable interactions. Sustainable collaboration programmes should be created, both in curricular and extra-curricular contexts, which may increase participation in sport

and physical activity. There is a wide variety of valuable models and successful programmes across Europe that address how this cooperation can be organised, which could be considered as best practices.

Recommendation 17 – Schools should seek to establish a cooperative framework with sport organisations and other local sport offers in order to promote both curricular and extra-curricular activities.

3.1 Sharing infrastructures and facilities

The availability and quality of physical education infrastructure and facilities, and of equipment in schools, impact on the nature, scope and quality of physical education programmes. Schools should have access to adequate physical education infrastructures, facilities and equipment that meet the standards of safety and hygiene, and that are maintained accordingly. It is obvious that the planning of physical education classes should take into account the available infrastructures and local environments.

Schools and local sport organisations need appropriate sport facilities to develop their activities in safe and healthy environments. There is a common interest to share facilities and, therefore, optimize the use of existing infrastructure to prevent building parallel facilities or leave existing ones underused. Such partnerships would be beneficial for regular physical education classes, but would also provide for new or expanded opportunities for after-school physical activity programmes. Institutional collaboration frameworks are needed to ensure that school and sport infrastructures are correctly planned and efficiently managed.

Recommendation 18 – Partnerships should be created between schools and sport sector organisations to ensure quality and availability of safe infrastructures and equipment for physical education, extra-curricular or after-school activities, and communities. These partnerships should ensure the efficient management of infrastructures and prevent duplicate or underused facilities.

After-school physical activity can be considerably promoted by making sport facilities of schools available after school hours. When schools have on-site sport facilities, they should be encouraged to engage in partnerships with groups from the local community and from the sport movement, to facilitate the access and use of these

facilities after school hours.

> ***Recommendation 19*** – School administration should be encouraged to open their sport facilities after schools hours to make them more accessible to local communities and sport organisations.

3.2 Label for schools promoting physical activity and sport

At European level, some documents or meetings have discussed the idea of introducing an EU label for sport-minded schools as a means to reinforce the synergistic cooperation between the education and sport sectors.

Luxembourg, during its EU Presidency in 2004, proposed to launch an EU-wide 'sports-minded schools' label that could be awarded to schools respecting key criteria, such as the school management, sports facilities and equipment, compulsory physical education, extra-curricular school activities and institutional links with sports clubs[27]. In the 2007 White Paper on Sport, the Commission proposed "*to introduce the award of a European label to schools actively involved in supporting and promoting physical activities in a school environment [...] with a view to raise public awareness of the needs and specificities of the sector, [...] make schools more attractive and improve attendance, [...] and support health promotion and awareness-raising campaigns through sport*"[28].

> ***Recommendation 20*** – A label should be created at European Union level to be awarded to schools respecting a set of criteria demonstrating active involvement in supporting and promoting physical activities and sport.

3.3 Talent development

Special attention should be given to young highly proficient athletes aspiring to a career in sport. MS have been developing specific programmes and focused measures to particularly target these groups.

[27] http://www.euractiv.com/sports/sports-minded-schools-idea-makin-news-214108
[28] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52007DC0391

At national level, most MS have been providing supportive frameworks to these exceptional young athletes attend special sports schools[29].

At local level, it is important that schools adjust their curriculum, class schedules, and develop several other favourable conditions to promote the integration of these students. Cooperation with sport sector organizations is also crucial to ensure more opportunities in this domain.

Recommendation 21 – School administration should create and strengthen the conditions to support and facilitate talent development of young athletes aspiring to a career in elite sports, by promoting the adoption of several specific measures such as flexible curricula and weekly schedules (allowing for sufficient time to train and compete), school enrolment, school transfer, remedial classes, flexible exams dates and tutor teachers.

3.4 Contribution of certified sport coaches

Certified sport coaches can also contribute to the success of the cooperative programmes developed between schools and sport sector organisations. Their experience, skills and commitment can support the development of new projects in schools both regarding physical education and in extra-curricular activities, to increase physical activity offers.

In order for their impact on a school to be sustainable in the long-term, these certified sport coaches should work alongside and up-skill physical education class teachers, rather than replacing them. MS authorities should, therefore, create supportive frameworks aimed at promoting participation of certified coaches, in a sustainable way. However, they should not replace compulsory physical education classes or compensate for a possible lack of physical education teachers.

[29] European Commission/EACEA/Eurydice, 2013. Physical Education and Sport at School in Europe Eurydice Report. Luxembourg: Publications Office of the European Union.

Recommendation 22 –Frameworks should be developed at the national level to promote participation of certified coaches in cooperation between schools, sport organisations and local authorities with the objective of creating a sustainable impact on schools and complementing the sport skills of teachers. This participation should not replace compulsory physical education classes or compensate for a possible lack of physical education teachers.

4. Valuable interactions between schools and local authorities

School is not the only institution responsible for young people's physical, mental, social and cultural development. Several other stakeholders such as family, the wider educational community, the sport sector, social organizations, and local authorities share the responsibility to complete the educational task, working in close partnership with schools.

In fact, local authorities, in partnership with schools, share the responsibility for physical, mental, social and cultural development of young people. Active lifestyles are often discouraged by the modern built and social environments. Governments can facilitate population level behavioural change by creating supporting and enabling environments.

Local authorities have a responsibility to implement and coordinate cross-sectoral programmes to enhance physical activity and sport participation as well as to promote active transport in the community. They are also in charge of urban and regional planning, security promotion and environment protection, physical activity and sport infrastructure planning, management and funding, and implementation of light physical activity monitoring systems to assure quality information to adjust local policies and strategies.

As highlighted by the UNESCO Worldwide Survey of School Physical Education (2013), only about a quarter of countries have formally arranged school-community partnership 'pathways'.

4.1 Active transport

Recommendation 23 – Local authorities should promote the necessary conditions to develop active transport to and from school, especially reducing car traffic and speed near schools, developing safe routes for cycling or walking groups ("pedibus") or active skating, providing bicycle racks and promoting active transport among all members of school communities.

4.2 Sport infrastructures

Recommendation 24 – Local authorities should develop efficient models to plan, manage and fund high quality and safe physical activity and sport infrastructures making them accessible for schools, sport organisations, local communities and citizens.

4.3 Awareness campaigns

Recommendation 25 – In cooperation with schools, sport organisations and other stakeholders, local authorities should develop and implement local campaigns to promote regular physical activity and sport as part of a healthier lifestyle.

5. Valuable interactions between schools and the private sector

The private sector companies provide sports facilities and services (e.g., fitness centres, private sport clubs or swimming pools, , golf, and sport events such as running races) for which a membership or an entrance fee is usually required.

The private sector can also play a role, alongside schools, in the promotion of physical education and extra-curricular activities. A close cooperation with schools and local authorities may increase the number and variety of programmes and activities availability, in particular in areas where physical activity opportunities are limited. In this sense, private businesses should be encouraged to develop with schools programmes such as sporting events, sport camps, regular sport programmes, novel extra-curricular activities and public awareness-raising events. They should not replace mandatory physical education classes.

The available offer could be accessible easily through modern technologies or internet websites. Moreover schools and private sector should seek to cooperate in order to make the available offer accessible for free or at low cost for schools pupils.

Some MS already have a legacy in this area and some best practices implemented by private sector organisations (including non-profit cultural or social organisations), can be highlighted such as the development of sustainable, collaborative school programmes (supported by specific funds), and the promotion of continuous professional development for teachers in technical and pedagogical areas.

Recommendation 26 – Private sector organisations should be encouraged to cooperate with schools or other educational institutions to develop a physical activity and sport offer for young people such as sport camps, regular sport programmes, extra-curricular activities, and public awareness-raising events, in particular in areas where opportunities are limited, and to make it accessible for pupils and school community. These activities must be framed by pedagogical principles, respect equity and ethical values but they should not replace compulsory physical education classes.

6. Monitoring

In its 2013 Recommendation on HEPA[30], the Council recognised that the availability of more information and better data on physical activity levels and HEPA promotion policies is an essential element to underpin better evidence-based policy. Therefore, monitoring provisions form part of the Recommendation. They were designed as minimal reporting requirements on general aspects of HEPA promotion that can be addressed by all MS.

MS were invited to appoint national Physical Activity Focal Points to support that monitoring framework. The Commission was invited to promote the establishment and functioning of this framework, in close synergy and cooperation with the World Health Organization (WHO), thereby avoiding duplication of data collection.

The Expert Group on HEPA considered that the evidence base could be further improved, by collecting data related to physical activity, fitness markers and sport participation especially for young people, including at local level. These data should include information collected by indirect methods, such as standardized questionnaires, combined with objectively measured data resulting from equipment like accelerometers and pedometers, and fitness test batteries.

It recommends considering the possibility to include it in the monitoring framework when evaluating the Council Recommendation.

Recommendation 27 – Effort should be encouraged to improve data collection on HEPA with objective measurements at the school level.

Recommendation 28 – The European Commission should report on the progress regarding the implementation of these recommendations.

[30] (2013/C 354/01)

7. Dissemination

The present recommendations will be presented to the Council Working Party on Sport under the Luxembourgish Presidency of the Council of the EU.

The Commission will explore the possibility of disseminating the results through relevant education-related channels at EU level.

Member States representatives in the XG HEPA will liaise with their national education ministries and other relevant ministries to disseminate the information at national level.

Commission européenne

Expert Group on Health-enhancing physical activity

Annex to Deliverable 1 – Recommendations to encourage physical education in schools, including motor skills in early childhood, and to create valuable interactions with the sport sector, local authorities and the private sector

Sport

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Introduction - Methodological approach

This document presents a literature review commissioned by DG EAC to ICF to support the preparation of Deliverable 1 of the Expert Group on Health-enhancing physical activity (HEPA): 'Recommendations to encourage physical education in schools, including motor skills in early childhood, and to create valuable interactions with the sport sector, local authorities and the private sector'.

The aim of this literature review is to gather scientific evidence on the links between children's level of physical activity vs. sedentarity and their school results. As a starting point ICF, in collaboration with DG EAC, identified relevant literature to be further analysed in this review and designed a mapping tool to capture the information needed for the selection of relevant literature; the table below provides the inclusion criteria used in this process.

Characteristics of the literature	**Inclusion criteria**
Time period	▪ 2000 – 2015
Geography	▪ EU-28 ▪ USA ▪ Other countries if relevant
Type of publication	▪ Major European Commission project reports ▪ European Commission outputs (e.g. Staff Working Documents and commissioned research) ▪ Peer and un-peer reviewed articles ▪ Publications of other research organisations / think tanks / advocacy bodies ▪ National-level documents on policies and measures
Population groups	▪ School-aged children ▪ University students ▪ Physical education teachers
Education levels	▪ Early childhood education and care ▪ Primary level ▪ Lower and upper secondary level ▪ University level

ICF then mapped the literature using the following mapping fields:

- Source (database from which the document was extracted)
- Title
- Author
- Year of publication
- Short description
- Geographical scope
- Target group by age
- Target group by level of education
- Type of research conducted, methods used
- Key results

- Reviewer's assessment of the strength of scientific evidence
- Related recommendations
- Hyperlink

ICF used a three-stage approach to conduct the literature review (i): first, ICF undertook preliminary desk research to identify policy documents and academic articles, which were then mapped in the database – 25 documents; (ii) in a second stage, ICF conducted in depth research to collect findings from the research community in relation to the recommendations proposed by the Expert Group. The screening of potentially relevant sources for the literature review involved the identification and collection of international academic literature through the EBSCO Host[1] and the PubMed[2] databases; (iii) eventually ICF also used a "snowball" approach to identify further studies of interest, using the references cited in the studies identified in the original review.

Deliverable 1 focused on providing scientific evidence to support the 21 initial recommendations from the HEPA Expert Group (XG). ICF then identified additional academic articles by searching for keywords from the recommendations. Eight articles provided by DG EAC were also included in the review.

Through a preliminary assessment, the strength of the evidence reported in the articles reviewed was rated as follows:

- Strong: evidence emerging from studies conducted with control groups or ex-ante and ex-post evaluation of the target group,
- Average: evidence reported from studies using strong evaluation methodologies, but that do not rely on control groups or ex-ante assessments,
- Weak: evidence resulting from interviews and opinions of participants, or anyhow considered as less reliable.

Following the additional research, 58 documents in total were identified as relevant for the study and mapped in the database. These documents were then analysed in depth in order to identify key results and evidence.

Following the inclusion of 17 additional recommendations by the Expert Group, ICF expanded the scope of the research so as to cover the 38 recommendations. ICF mapped and reviewed 17 additional relevant documents. At this stage, ICF had reviewed and analysed 75 documents.

Following a reshuffle of the recommendations, the final version of Deliverable 1 counted a total of 28 recommendations. ICF looked for additional relevant sources. In total, 82 documents were reviewed to form the basis for this version of the literature review report.

The remainder of this report is structured as follows:

- Recommendations as agreed by the Expert Group (framed in boxes); and
- Supporting evidence from the literature reviewed – below each recommendation.

Given the nature of these recommendations and the over-arching theme, a number of recommendations share supporting evidence and therefore specific study results have been quoted numerous times under the relevant recommendations.

[1] EBSCO is a provider of online information resources to researchers in academia, research organisations and government. This provides access to full text for over 10,000 peer reviewed journals and periodicals in dozens of languages.
[2] Database developed and maintained by the U.S. National Centre for Biotechnology Information (NCBI), providing access to over 24 million biomedical citations.

This report is broken down into the following sections:

Report sections	**Related recommendations**
1. Recommendations to encourage physical education as from early childhood	Recommendation 1
1.1. Physical literacy and fundamental motor skills to be promoted before any school setting	Recommendation 2
1.2. Physical education curricular content	Recommendations 3, 4, 5, 6 and 7
1.3. Inclusive approach	Recommendation 8
1.4. Injury prevention	Recommendation 9
1.5. Physical education taught time	Recommendation 10
1.6. Exemptions from physical education	Recommendation 11
1.7. Assessment in physical education	Recommendation 12
1.8. Physical education teachers	Recommendations 13 and 14
1.9. Monitoring of physical education	Recommendation 15
1.10. Extracurricular activities and activities outside physical education curriculum	Recommendation 16
2. Valuable interactions between schools and the sport sector	Recommendation 17
2.1. Sharing of infrastructures and facilities	Recommendations 18 and 19
2.2. Label for schools promoting physical activity and sport	Recommendation 20
2.3. Talent development	Recommendation 21
2.4. Contribution of certified sport coaches	Recommendation 22
3. Valuable interactions between schools and local authorities 3.1. Active transport	Recommendation 23
3.2. Sport infrastructures	Recommendation 24
3.3. Awareness campaigns	Recommendation 25
4. Valuable interactions between schools and the private sector	Recommendation 26

5. Monitoring	Recommendations 27 and 28

Context setting

Before presenting the recommendations relating to the promotion of physical education and physical activity from early childhood, this sub-section puts forward evidence highlighting the overarching issues at stake, notably sedentarity in early childhood and obesity among children, which can lead to more severe problems in adulthood. This evidence, and other related evidence gathered during this process, therefore provides the context to and forms the basis of these experts' recommendations and any follow-up action to be taken.

- In the 2012 Health at Glance report[3], the OECD provided examples of some of the key health-related problems faced by young people, in particular overweight and obesity. The report mentioned various studies that have shown the existence of such problems and their negative impacts on both children and adults:

  - Sassi (2010), as well as Currie et al. (2012), showed that problems of excess weight during childhood were associated with increased risks of becoming obese once adults, including risks such as diabetes, cardiovascular diseases, cancers, a reduced quality of life and premature death.

  - The OECD reported that, among 15-year-olds in EU member states, boys tended to report excess weight more often than girls: in 2009-2010 for instance, one boy out of six and one girl out of ten reported being overweight or obese. According to the OECD, these reported rates of excess weight have increased slightly for this age group over the past decade in most EU member states – from 11% in 2001-2002 to 13% in 2009-2010. In the Czech Republic, Estonia, Poland, Romania and Slovenia, increases were higher than 5%. Besides, in a variety of countries, more than 15% of adolescents reported being overweight or obese in 2009-2010 (Croatia, Greece, Iceland, Italy, Luxembourg, Portugal, Slovenia and Spain).

  - Bemelmans et al. (2011) highlighted childhood as a key period of life to start forming healthy behaviours. They referenced studies showing that community-based initiatives and local interventions focusing on children up to 12 years of age can have positive impacts on changing behaviours. They also emphasised the important role played by all actors – parents, teachers, health professionals and schools – to ensure that children are aware of the importance of healthy behaviours, good nutrition and physical activity.

- Verloigne et al. (2012)[4] conducted a study to assess the levels of sedentary time, light, moderate and vigorous physical activity among 10 to 12 year olds across five European countries, with a view to study differences in sedentary

3 http://ec.europa.eu/health/reports/docs/health_glance_2012_en.pdf
4 http://www.ncbi.nlm.nih.gov/pubmed/22462550/

time and PA according to gender and country. They highlighted that large proportions of children across the countries covered spent a lot of time sedentary and did not meet the PA recommendations:

> *"Girls spent significantly more time sedentary (500 minutes/day) than boys (474 minutes/day) and significantly less time in light (267 minutes/day) and moderate-to-vigorous PA (32 minutes/day) than boys (284 minutes/day; 43 minutes/day respectively; $p < 0.001$).*
>
> *Only 4.6% of the girls and 16.8% of the boys met moderate-to-vigorous PA recommendations of at least 60 minutes/day. Greek boys were more sedentary (510 minutes/day; all at $p < 0.05$) than other boys. Dutch girls were less sedentary (457 minutes/day; all at $p < 0.05$) than other girls. Swiss girls displayed more moderate-to-vigorous PA (43 minutes/day; at $p < 0.05$) than other girls".*

- In their monograph on *The relation of Childhood Physical Activity to Brain Health, Cognition, and Scholastic Achievements*, Hillman et al. (2014)[5] described the state of play and some of the key issues related to the lack of physical activity among children. We provide below a selection of the most striking elements found in the literature reviewed in this context:

> *"There is a pandemic of physical inactivity among today's human beings. Physical inactivity has rapidly accelerated over the last century, with recent reports forecasting that, over the next few decades, inactivity will continue to rise throughout much of the industrialized world" (Ng and Popkin, 2012).*
>
> *"Inactive lifestyles have been found to be detrimental to the health and well-being of children as well, with contemporary estimates indicating that the current generation of youth will likely live shorter and less healthy lives than their parents for the first time in U.S. history" (Fontaine et al., 2003).*
>
> *"United States (U.S.) schools, which reach approximately 55.5 million children between 5 and 17 years of age, have contributed to the declining health of youth through the implementation of policies aimed at minimising or replacing physical activity opportunities from the school day in an effort to increase academic performance" (Institute of Medicine, 2013).*

- Hillman et al. (2008)[6] already highlighted the evidence of health-related problems in a literature review dating back from 2008. They reported on evidence indicating that children are becoming more and more sedentary and

5 http://onlinelibrary.wiley.com/doi/10.1111/mono.v79.4/issuetoc
6 http://search.ebscohost.com/login.aspx?direct=true&db=mnh&AN=18094706&site=ehost-live

unfit, and that these lifestyle factors can be associated with an earlier onset of several chronic diseases (such as type II diabetes and obesity), which typically do not emerge before adulthood. The authors also pointed out that almost three-quarters of adults in the United States (74%) did not meet the recommended guideline of at least 30 minutes of moderate-intense Physical Activity (PA) on most days of the week.

- Another literature review conducted by Reilly (2008)[7] on physical activity, sedentary behaviour and energy balance in preschool children put forward evidence of a prevalence of overweight and obesity: in the UK, for example, approximately 10% of children were obese when entering primary school. The authors also underlined "recent rapid changes in body fatness, fat distribution and the prevalence of overweight and obesity among preschool children, indicating that the preschool population has undergone rapid changes in lifestyle in recent years". They also referred to other studies presenting these issues, e.g. "a secular trend to earlier adiposity rebound […] and reduced habitual physical activity and/or increased habitual sedentary behaviour" (Reilly et al., 2001; Rolland-Cachera, 1999); or longitudinal studies of persistence of overweight and obesity which "tended to suggest that trajectories of excess weight gain are often established well before the preschool period (Reilly et al., 2005; Ekelund et al., 2006; Huus et al., 2007; Li C et al., 2007), and that overweight and obesity established by the preschool period tends to persist (Nader et al., 2006)".

- Another series of issues raised by the literature, for instance the 2013 Worldwide Survey of School Physical Education from the UNESCO[8], concerns the inadequate provision of physical education at school, and its detrimental effects on pupils. Some of the main issues are listed below:

  - *Limited PE curriculum time allocation*: while there is an average of 103 minutes of PE weekly at primary school level (range of 25–220 minutes), this decreases to an average of 100 minutes weekly at secondary school level (range of 25–240 minutes), with important regional and national differences.

  - *Low status of PE teachers*: the UNESCO reports that physical education is often considered to have lower status than other subjects, which leads to a higher frequency of cancellation of PE lessons compared to other subjects. Besides, in approximately one-fifth of the countries covered by the survey, PE teachers do not enjoy the same status as other subject teachers (issues of inequality and ambivalence in physical education teacher status).

  - *Issues linked to teaching personnel*: as pointed out by the UNESCO, evidence suggests deficiencies in teacher supply (notably of PE specialists),

7 http://journals.cambridge.org/download.php?file=%2FPNS%2FPNS67_03%2FS0029665108008604a.pdf&code=6d119f48de7ee3fc5e74d9e8bd98cb77
8 http://unesdoc.unesco.org/images/0022/002293/229335e.pdf

inadequate preparation of PE teachers, as well as negative attitudes and low levels of motivation among some teachers responsible for PE delivery. The UNESCO also highlights issues relating to the quality of PE teacher training, limited teaching resources, maladjusted supervision of practice and lack of professionalism, which can have detrimental impacts on the quality of PE provision.

- *Issues linked to physical education equipment and facilities*: evidence suggests concerns linked to PE facilities (indoors and outdoors) and associated amenities (e.g. changing rooms and showers), equipment provision and facility maintenance. These issues, associated with challenges linked to inadequate maintenance, can have negative impacts on the quality of PE programmes.

This context therefore highlights the necessity to take action to encourage physical education throughout life. It sets the scene for the following recommendations developed in this report.

1. Recommendations to encourage physical education as from early childhood

Recommendation 1 – Physical activity should be promoted from birth and throughout the life course, at all educational levels: early childhood, primary, secondary education, and tertiary level. The pre-school and school environments play a key role in the development of physical education and promotion of physical activity and sport.

In both pre-school and school environments, results from scientific studies suggest the positive influence of physical activity on a variety of outcomes:

- Results of a study on the links between physical fitness and academic achievement (Castelli et al., 2007)[9] suggest that schools, particularly at elementary level, should provide appropriate opportunities for children to be physically active and become physically fit: "physical education, among other physical activity opportunities surrounding a school day (i.e., active recess, both before- and afterschool programmes), is positioned to play an important role in addressing public health issues." Schools need to define clearly which curricular components have the greatest impacts.

- A recent systematic review on tracking physical activity and sedentary behaviour in childhood (Jones et al., 2013)[10] highlighted the need to establish recommended levels of physical activity and sedentary behaviour during the early years of life (between birth and six years). They recommended that (i)

[9] http://www.humankinetics.com/acucustom/sitename/Documents/DocumentItem/7336.pdf
[10] http://www.ncbi.nlm.nih.gov/pubmed/23683983

"early childhood should be targeted as a critical time to promote healthy lifestyle behaviours through methodologically sound prevention studies"; and that (ii) "future tracking studies should assess a broad range of sedentary behaviours using objective measures."

- Further evidence of a positive relationship between physical activity and aerobic fitness on the one hand, and the cognitive and brain health of children on the other, was documented in a literature review focusing on the importance of physical activity and aerobic fitness for cognitive control and memory in primary school children aged 7-10 years (Chaddock-Heyman et al., 2014)[11]. In this review, the authors provided evidence and results from research that show the benefits of physical activity and aerobic fitness on "cognition and brain structure and function involved in attention, inhibition, and memory; skills important for scholastic achievement and daily living".

Similarly, physical activity and sport should also be promoted at university level:

- Field et al. (2001)[12] studied the links between exercise and adolescents' relationships and academics. They administered a Likert-type questionnaire to 89 high school students in the US to collect information on their exercise habits, relationships with parents and peers, depressive tendencies, sports involvement, drug use, and academic performance. Students were grouped in two groups depending on their level of exercise.

  Results showed that students with a high level of exercise had better relationships with their parents, reported less depression and lower level of drug use, were involved in sports more hours per week, and had higher grade point averages, compared to students with a low level of exercise. These findings therefore suggest that regular participation in physical activity has a positive influence on various aspects of health, well-being and various aspects of daily life.

- Turkish researchers conducted an investigation of aggressive and self-improving humour levels of university students (19-26 years old) doing and not doing sports (Akandere et al., 2015)[13]. The sample group consisted of 50 female and 50 male students from Selcuk University School of Physical Education & Sports and doing sports, and 50 female and 51 male students from Necmettin Erbakan University and not doing sports. Statistical results showed that sport has an effect on the aggressiveness and self-enhancing humour of students: aggressiveness levels were lower and self-enhancing humour levels were higher among students doing sport. In this regard, sport has a positive effect on university students.

[11] http://www.ncbi.nlm.nih.gov/pubmed/?term=The+importance+of+physical+activity+and+aerobic+fitness+for+cognitive+control+and+memory+in+children.+Monographs+of+the+Society+for+Research+in+Child+Development

[12] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2002062557&site=ehost-live

[13] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2012952540&site=ehost-live

- The study 'Investigation of aggressive and self-improving humour levels of Turkish university students doing and not doing sports' (Akandere M. et al., 2015)[14] showed that the aggressiveness of students doing sport was lower and that their level of self-enhancing humour was higher than students not doing sport. The data collected therefore suggest that sport has a positive effect on university students, which should encouraged universities to promote physical activity among students.

- Another study conducted in Turkey (Ermis and Imamoglu, 2013)[15] looked at the effects of sport on the multiple intelligences of university students. For this purpose, 1,580 students (524 of who do regular sports and 1,055 of who do not) from different departments at Ondokuz Mayis University and Ondokuz Mayis Vocational Police High School during the 2010-2011 academic year participated in the study. Findings showed that doing sports regularly has a positive effect on verbal, interpersonal and bodily-kinaesthetic intelligence. In particular:

  > *"Verbal, interpersonal and bodily-kinaesthetic intelligence scores of the students who do sports regularly were significantly higher than the scores of the students who do not;*
  >
  > *While the students who do individual sports had higher logical, intrapersonal and naturalist intelligence scores, the students who do team sports had higher verbal and interpersonal intelligence scores. This difference was statistically significant;*
  >
  > *Doing sport regularly affected the bodily-kinaesthetic and interpersonal intelligence of the male students significantly. It is an expected result for the students who do sport regularly to have higher bodily-kinaesthetic intelligence scores than those who do not."*

- An evaluation of the Indigenous Youth Sports Program (IYSP) in Australia (Macgregor et al., 2015)[16] – which uses sports as a means of engaging Indigenous school students into higher education and enhancing their awareness about university – showed that participation in higher education may be increased by using sports as a medium for career guidance and post-school study pathways, since sport is used as a way to facilitate interactions between schools and Indigenous students. The evaluation demonstrated that the IYSP managed to increase Indigenous secondary school students' knowledge of higher education opportunities and provided them with key information on their career and study options, while, before the programme most of them had no clear perception of post-study career options in five years' time.

[14] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2012952540&site=ehost-live
[15] http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=92950320&site=ehost-live
[16] http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=102345174&site=ehost-live

The authors reported that "the absolute number of participants talking to friends about potential career options almost doubled following the IYSP (58 to 94), suggesting that it may have a wider reach to individuals in the region beyond those who attended the programme." Besides, changes in the responses to two statements – 'My education is my ticket to the job or career I want in the future' and 'University is something I can consider anytime in the future' – in the pre- and post-programme survey suggests that the programme succeeded in increasing the participation of Indigenous students in higher education in Australia through the use of sport.

1.1. Physical literacy and fundamental motor skills to be promoted before any school setting

Recommendation 2 – All those in charge of children from birth and through early childhood should be aware of the important role they have in starting an educational process for motor development and physical activity. Parents, educators in day care settings, and teachers in pre-schools should be assisted to develop their knowledge and knowhow for this topic, especially for sensorimotor learning and active play. Community-based programmes should be developed and offered to parents, educators and teachers.

Several studies highlighted the key role played by parents on the development of physical activity among children. They suggest that parents in particular should be assisted to develop their knowledge and knowhow for this topic, and thus positively influence their children's physical development.

- A recent study conducted in Chile (Aguilar et al., 2015)[17] aimed at determining the influence of screen time on the association between physical fitness and academic attainment. For this purpose, 395 seventh-grade primary schoolchildren (average age 12.1) from seven schools were selected, and self-reported physical activity and screen time were evaluated. Results showed that "high academic attainment was associated with higher cardiorespiratory fitness levels" and that this relationship was "weakly impaired by screen time". These findings suggest that parents and policymakers should minimise the negative effects of screen time on children's lives and promote the beneficial effects of healthy habits.

- In order to know whether time spent outside has to be imposed by the school, a team of researchers assessed a nine-month programme in Singapore to inform parents of the importance of outdoor time to prevent myopia, including step-counters, organisation of outdoor week-end activities and provision of cash prizes for cooperation. After the experiment, researchers observed that outdoor time was not statistically different from that of a control group with no such campaign (Ngo, C. S. et al., 2014). This suggests that additional outdoor time should be imposed by schools directly, since it may be hard to convince parents to voluntarily send their children outside.

- The 2013 Eurydice report on 'Physical Education and Sport at School in Europe'[18] provides an example of a large-scale initiative in the UK (Wales), which involves coaches in teaching physical education at school: the 'Dragon Multi-Skills and Sport' programme[19] introduces children aged 7-11 to coaching, skills development and appropriate competition using modified versions of adult

[17] http://www.sciencedirect.com/science/article/pii/S0021755715000078
[18] http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/150EN.pdf
[19] http://sport.wales/community-sport/education/dragon-multi-skills--sport.aspx

games to reflect their needs and skill levels. Learning resources for the programme include volunteer parents, teachers and external coaches, who are used to develop opportunities outside the school curriculum and in the community. Teachers can liaise with coaches to use them as resources in physical education lessons.

- A study conducted in Belgium (Ducheyne et al., 2012)[20] looked at individual, social and physical environmental correlates of 'never' and 'always' cycling to and from school, among 10 to 12 years olds living within a three-km radius of the school. The study aimed at identifying the main reasons why some children engage in regular cycling to school whilst other children did not. The results showed that environmental factors significantly influenced whether pupils cycled to school or not. Only in neighbourhoods where parents perceived traffic safety to be high was there a significant association with cycling to school.

Results from the literature also suggest that teachers, notably at pre-school level, should be supported to enhance their awareness of the benefits of physical education and develop appropriate programmes.

- The evaluation of 'Be Active Kids' (De Marco et al., 2015)[21], a physical activity programme for children in child care settings accompanied by a teacher training component (North Carolina, US), showed that such a programme can enhance the level of physical activity of very young children. Prior to the introduction of the programme, activity in these child care centres was very limited. Results showed that, from pre- to post-intervention, moderate-to-vigorous physical activity increased in four of the six classrooms, while sedentary physical activity decreased in five. As reported by the authors, "the biggest increases in physical activity were found during teacher-directed activity, when moderate-to-vigorous and light activity increased in five and six classrooms, respectively."

  These findings suggest that teacher training has a positive influence on the improvement of physical activity in child care settings. Teachers may be more comfortable providing physical activity lessons to children when they know these are appropriate to promote healthier child outcomes.

- In an earlier literature review on the influence of sport and physical education on children and youth's self-esteem (Whitehead et al., 1997)[22], the authors collected evidence of the positive effects of physical activity on self-esteem and motivation. They also reported that both physical activity and physical education programmes could have negative effects on self-esteem and motivation if used inappropriately. The findings suggest that teachers, coaches and other relevant stakeholders should receive specific guidance so that physical education is

[20] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3541214/pdf/1479-5868-9-142.pdf
[21] http://www.beactivekids.org/assets/downloads/EarlyEducationDevelopmentArticle.pdf
[22] http://web.b.ebscohost.com/ehost/detail/detail?sid=b06b5a56-2658-4196-85c3-9cdc2c660a07%40sessionmgr198&crlhashurl=login.aspx%253fdirect%253dtrue%2526hid%253d4207%2526db%253dpsyh%2526AN%253d1997-08965-007%2526site%253dehost-live&hid=107&vid=0&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=psyh&AN=1997-08965-007

appropriately implemented.

1.2. Physical education curricular content

Recommendation 3 – From birth and during early childhood, physical education should include daily active play, enjoyable games, and sports aiming to develop core neuromotor skills, physical, psychological, and social attributes. In primary and secondary education, physical education should include a broad variety of different games, dance, sports, and physical exercises. Physical activity at school and physical education should be fun and enjoyable to maximise children's willingness and desire to learn and participate.

- The World Health Organisation (WHO), in its 2010 'Global recommendations on physical activity for health'[23], recommended that children and young people (5-17 years) do at least 60 minutes of moderate to vigorous-intensity physical activity per day, based on scientific evidence proving that physical activity provides strong health benefits. The WHO recommended that activities for children and young people should include games, play, sports, recreation, physical education or planned exercise at different levels, e.g. family, school and community. In the same report, the WHO refers to observational and experimental studies, which found that "higher levels of physical activity were associated with more favourable health parameters and improvements in health indicators". The WHO notably highlighted the following:

  "The documented health benefits include increased physical fitness (both cardiorespiratory fitness and muscular strength), reduced body fatness, favourable cardiovascular and metabolic disease risk profiles, enhanced bone health and reduced symptoms of anxiety and depression. Maintaining high amounts and intensities of physical activity starting in childhood and continuing into adult years will enable people to maintain a favourable risk profile and lower rates of morbidity and mortality from cardiovascular disease and diabetes later in life".[24]

- Further evidence of a positive relationship between physical activity and aerobic fitness on the one hand, and the cognitive and brain health of children on the other, was documented in a literature review focusing on the importance of physical activity and aerobic fitness for cognitive control and memory in primary school children aged 7-10 years (Chaddock-Heyman et al., 2014)[25]. In this review, the authors provided evidence and results from research that show the benefits of physical activity and aerobic fitness on "cognition and brain structure

[23] http://whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf?ua=1
[24] Ibid
[25] http://www.ncbi.nlm.nih.gov/pubmed/?term=The+importance+of+physical+activity+and+aerobic+fitness+for+cognitive+control+and+memory+in+children.+Monographs+of+the+Society+for+Research+in+Child+Development

and function involved in attention, inhibition, and memory; skills important for scholastic achievement and daily living".

The review also referred to another longitudinal study (Davis et al., 2011), where sedentary and overweight 7- to 11-year-old children were randomised to either a non-exercise control group or to a treatment group with an exercise programme for 13 weeks, which included aerobic games (e.g. running games, jump rope, basketball, soccer) for 20 or 40 minutes per day. The study demonstrated that "only the high-dose aerobics group (40 minutes per day) showed increases in cognitive control (the most demanding cognitive function measure, 'planning') and mathematics achievement".

- A study from Booth et al. (2014)[26] measured the links between the levels of physical activity among 4,755 children aged 11 in the UK and their results at national tests administered at ages 11, 13 and 16 – using linear regression analyses with CPM (counts per minute) and % of moderate-vigorous intensity of physical activity (MVPA) as predictor variables. Results from the study suggested a "long-term positive impact of MVPA on academic attainment in adolescence." In other words, physical activity increased performance in English, Maths and Science assessments in both sexes at the age of 16. The authors concluded that devoting more time to physical education not only has benefits for health and well-being, but is also not detrimental to academic achievement.

- A recent study from Haapala (2014)[27], which investigated the links between different types of physical activity and sedentary behaviour with reading and arithmetic skills among 186 children aged six to eight years in Finland, showed that "physical activity was directly associated with reading fluency in Grades 1 and 2", and that "children who participated in any organised sports in Grade 1 had better arithmetic skills in Grades 1–3 than those who did not engage in organised sports". The study also showed that "physically active school transportation in Grade 1 was directly related to reading fluency in Grades 1–3 and reading comprehension in Grade 1" but that, among girls, "unsupervised PA in Grade 1 was inversely related to reading fluency in Grade 2". The authors concluded that "higher levels of PA are associated with enhanced attention, concentration and on-task behaviour, which may improve academic achievement among children". Although engagement in organised sports was related to better arithmetic skills in the whole sample of children, the authors warned that "only some types of PA may improve academic skills among children".

  Eventually, the authors mentioned strong evidence-based intervention studies that have demonstrated that implementing 90 minutes of moderate-to-vigorous physical activity per week within a school day, adding 60 minutes of physical education per day or increasing after-school physical activity for 40 minutes per day enhances academic achievement among children:

[26] http://bjsm.bmj.com/content/48/3/265.full.pdf+html
[27] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4160223/

- Physical Activity Across the Curriculum (PAAC): a randomised controlled trial to promote physical activity and diminish overweight and obesity in elementary school children (Donnelly et al., 2009);
- Habitual physical activity and academic performance (Shephard, 1996);
- Exercise improves executive function and achievement and alters brain activation in overweight children: a randomised controlled trial (Davis et al., 2011);
- The effect of acute treadmill walking on cognitive control and academic achievement in preadolescent children (Hillman et al., 2009); and
- Exercise improves behavioural, neurocognitive, and scholastic performance in children with attention-deficit/hyperactivity disorder (Pontifex et al., 2013).

- The evaluation of 'Be Active Kids' (De Marco et al., 2015)[28], a physical activity programme for children in child care settings accompanied by a teacher training component (North Carolina, US), showed that such a programme can enhance the level of physical activity of very young children. Prior to the introduction of the programme, activity in these child care centres was very limited. Results showed that, from pre- to post-intervention, moderate-to-vigorous physical activity increased in four of the six classrooms, while sedentary physical activity decreased in five. As reported by the authors, "the biggest increases in physical activity were found during teacher-directed activity, when moderate-to-vigorous and light activity increased in five and six classrooms, respectively."

  These findings suggest that teacher training has a positive influence on the improvement of physical activity in child care settings. Teachers may be more comfortable providing physical activity lessons to children when they know these are appropriate to promote healthier child outcomes.

- Eventually, a study on the links between physical fitness and academic achievement looked at 259 public school third- and fifth-grade students in the US (Castelli et al., 2007).[29] Results indicated that tests of physical fitness, notably aerobic capacity, were positively associated with academic achievement, including total academic achievement, mathematics achievement and reading achievement: "physical fitness was related to academic performance in third- and fifth-grade children, providing general support for the notion that children who are physically fit are more likely to perform better on standardised academic achievement tests. The current study presents new evidence that specific components of physical fitness are globally associated with academic performance during maturation, independent of other possible factors, as well as through extended application to younger school-aged children."

These results suggest that time spent participating in physical activity will not hurt cognitive performance or academic achievement. On the contrary, participation in

[28] http://www.beactivekids.org/assets/downloads/EarlyEducationDevelopmentArticle.pdf
[29] http://www.humankinetics.com/acucustom/sitename/Documents/DocumentItem/7336.pdf

physical activity is beneficial to cognition and academic performance.

- In its 2015 Quality Physical Education, Guidelines for Policy Makers[30], the UNESCO highlighted emerging research supporting the positive links between physically activity and academic achievement among youth. In particular if young people engage in at least the daily recommended amount of physical activity, 'there are potentially broad social and academic gains' (Burton and VanHeest, 2007; Hillman et al., 2009; Hollar et al., 2010; IOM, 2013; Shepard and Trudeau, 2005)".

  The UNESCO report cites interesting research from Whitehead (2010) on the influence of a diversified physical education on the abilities and interests of young people, notably regarding "assurance, self-confidence, sound coordination and control, response to the demands of a changing environment, relation with others, sensitivity in their verbal and non-verbal communication, and empathetic relationships." Individuals who become physically literate enjoy discovering new activities and games, for both their physical and intellectual development.

  The UNESCO report also presents some good practice examples of the links between a diversified physical education, the interests of children in doing exercise and wider cognitive and psychological benefits:
  - In Canada, the 'Passport for Life' programme supports the development of physical education, through enhancing knowledge, awareness and understanding of physical literacy among students and helping teachers to deliver quality lessons. Assessment of the programme demonstrated that:
    - "Substantial progress were observed across several areas of fitness;
    - All children involved benefited from improved movement competencies;
    - Improved participation and interest were recorded among children;
    - Students developed life skills and understood the need for healthy lifestyles; and
    - Higher feelings of confidence, importance, autonomy and enjoyment, alongside less anxiety in physical activity, were reported by students".
  - In the US, Miami-Dade County Public Schools enable students to design programme and select activities, turning the focus of physical education from traditional sports to activities and games that students want to keep playing. Positive results were observed at different levels:
    - "Physical Health: 61% of students passed 5/6 measures on the FITNESSGRAM;
    - Individual: Young people enjoyed physical activity more, and felt better;
    - Social: Young people became more inclusive and worked together more; and
    - Family habits: Positive changes in nutrition and attitudes toward activity were observed to have been transferred to the home environment."
  - In China, the 'Let Me Play' programme was designed to exploit fun sport experiences within a structured school environment. Physical education

[30] http://unesdoc.unesco.org/images/0023/002311/231101E.pdf

teachers received trainings on how to use sports and play to develop key life skills, and the programme was integrated into classes and daily free play. The social and academic impacts of the programme were measured:
- "91% of students reported improved concentration and behaviour during class;
- 85% of students reported improvements in their relations with peers;
- 85% of students reported gains in self-worth, self-esteem and confidence;
- 89% of students said that sports are now part of their life; and
- On average, physical activity increased 1.3 hours per young person per day."

- A review summarising the evidence (cross-sectional studies) of associations of cardiorespiratory fitness and motor skills with cognition, brain functioning and academic performance among children up to 13-years of age (Haapala EA, 2013) concluded that "children with higher cardiorespiratory fitness and better motor skills have more efficient cognitive processing at the neuro-electric level", which has been associated with "better inhibitory control in tasks requiring rigorous attention allocation, more efficient cognitive functions including inhibitory control and working memory, and better academic performance."[31]

- Similarly, a systematic review from Lees and Hopkins (2013)[32] looked at randomised control trials measuring the effects of aerobic physical activity (APA) on the psychological, behavioural, cognitive and academic outcomes among children younger than 19 years (Canada, Germany, the UK and the USA). All such studies showed that APA was positively correlated with cognition, academic achievement, behaviour and psychosocial functioning outcomes. The review also reported that "there was no documentation of APA having any negative impact on children's cognition and psychosocial health, even in cases where school curriculum time was reassigned from classroom teaching to aerobic physical activity."

- As reported by Haapala (2013), the following cross-sectional studies suggest that higher cardiorespiratory fitness is associated with better results and higher scores in standardised achievement tests, and with higher ratings, compared to peers with a lower fitness level:
  - Associations of physical fitness and academic performance among schoolchildren (Van Dusen et al., 2011);
  - The association of health-related fitness with indicators of academic performance in Texas schools (Welk et al., 2010); and
  - Aerobic fitness thresholds associated with fifth grade academic achievement (Wittberg al., 2010).

Other studies also suggest a positive correlation between physical fitness and

[31] http://www.ncbi.nlm.nih.gov/pubmed/23717355
[32] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3809922/

academic performance:

- Childhood aerobic fitness predicts cognitive performance one year later (Chaddock et al. 2012) and A functional MRI investigation of the association between childhood aerobic fitness and neurocognitive control (Chaddock et al., 2012);
- Cardiorespiratory fitness and the flexible modulation of cognitive control in preadolescent children (Pontifex et al., 2011); and
- Aerobic fitness is associated with greater efficiency of the network underlying cognitive control in preadolescent children (Voss et al., 2011).

- In its Worldwide Survey of School Physical Education (2013)[33], the UNESCO highlighted one good practice example from the UK (England), namely 'Olymkids', an annual multi-sport event involving over 500 children from several primary schools who gather to compete in a range of activities. Children are mixed into teams with children from other schools, each team taking the name of an Olympic nation. As the UNESCO reports, "not only does this event provide competition but it also provides an ideal environment for developing inter-personal skills".

- Field et al. (2001)[34] studied the links between exercise and adolescents' relationships and academics. They administered a Likert-type questionnaire to 89 high school students in the US to collect information on their exercise habits, relationships with parents and peers, depressive tendencies, sports involvement, drug use, and academic performance. Students were grouped in two groups depending on their level of exercise. Results showed that students with a high level of exercise had better relationships with their parents, reported less depression and lower level of drug use, were involved in sports more hours per week, and had higher grade point averages, compared to students with a low level of exercise. These findings suggest that regular participation in physical activity has a positive influence on health, well-being and various aspects of daily life.

- A study conducted in Finland (Kantomaa et al., 2009)[35] assessed whether physical activity, mental health and socio-economic position were associated with the overall academic performance and future educational plans of adolescents aged 15–16 years. The study demonstrated that physical activity was associated with high overall academic performance and plans for higher education among both boys and girls: "physically active adolescents were about twice as likely to report high overall academic performance and plans of continuing into higher education compared with physically inactive adolescents." The authors also referred to a study that showed that adolescents taking part in five or more weekly bouts of physical activity were more likely to achieve 'A' grades in Mathematics and Science than adolescents achieving less than five bouts physical activity per week (Nelson and Gordon-Larsen, 2006).

[33] http://unesdoc.unesco.org/images/0022/002293/229335e.pdf
[34] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2002062557&site=ehost-live
[35] http://her.oxfordjournals.org/content/25/2/368.long

- Hansen et al. (2014)[36] evaluated both linear and nonlinear associations of physical activity and aerobic fitness – progressive aerobic cardiovascular endurance run (PACER) laps – with students' academic achievement among a sample of 687 second and third grade students from 17 Midwest schools. They showed that fitness, but not physical activity, had a significant positive impact on both spelling and mathematics achievement. According to the authors, "results indicate that 22-28 laps on the PACER was the point at which the associated increase in achievement per lap plateaued for spelling and mathematics." This tends to indicate that physical activity has positive effects on educational outcomes to some extent only, and that it should always be framed by appropriate facilities and methodologies.

- Turkish researchers conducted an investigation of aggressive and self-improving humour levels of university students (19-26 years old) doing and not doing sports (Akandere et al., 2015).[37] The sample group consisted of 50 female and 50 male students from Selcuk University School of Physical Education & Sports and doing sports, and 50 female and 51 male students from Necmettin Erbakan University and not doing sports. Statistical results showed that sport has an effect on the aggressiveness and self-enhancing humour of students: aggressiveness levels were lower and self-enhancing humour levels were higher among students doing sport. In this regard, sport has a positive effect on university students.

- Hillman et al. (2008)[38] conducted a review of literature assessing the positive effects of aerobic physical activity on cognition and brain function. The review highlighted interesting results on the positive links between physical activity and cognition:
  - One meta-analysis (44 studies reviewed) on the relationship between physical activity and cognition in children determined a positive relation between physical activity and cognitive performance in school-aged children (4-18 years) in eight measurement categories – perceptual skills, intelligence quotient, achievement, verbal tests, mathematic tests, memory, developmental level/academic readiness and other (Sibley et al., 2003);
  - Several studies indicated that "an increase in the amount of time dedicated towards physical health-based activities (such as physical education) is not accompanied by a decline in academic performance. The implications of these findings are important for promoting better physical health, without the loss of other educational benefits, in school-age children" (Ahamed et al., 2007; Castelli et al., 2007; Kim et al., 2003); and
  - Other research studies indicate that physical activity and aerobic fitness may have a positive effect on multiple aspects of brain function and cognition throughout the lifespan (Heyn et al., 2004; Adlard et al., 2005).

[36] http://www.ncbi.nlm.nih.gov/pubmed/24781896
[37] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2012952540&site=ehost-live
[38] http://search.ebscohost.com/login.aspx?direct=true&db=mnh&AN=18094706&site=ehost-live

- One recent study conducted in Canada (Ma et al., 2014)[39] assessed 'FUNtervals', a time-efficient physical activity programme that can be performed in only four minutes. The study assessed whether this tool could enhance selective attention among children in grade 3-5. The authors observed that "four minutes of high-intensity interval activity improves selective attention in elementary school children. […] More importantly, students made fewer errors during the d2 test of attention following 'FUNtervals'." The authors conclude that, through this tool, the selective attention in 9- to 11-year olds children was improved – their research was partly based on two previous studies that demonstrated the positive effects of exercise on selective attention: Tine et al. (2012) and Niemann et al. (2013).

- Light et al. (2014)[40] evaluated the 'Game Sense' pedagogy, an approach that enables players to practice and improve their skills in a realistic environment under game-like conditions. They recommended focusing on games rather than on mastering skills and techniques, in order to better suit learners' abilities and enable them to understand – not only how – but also when, where and why apply some skills. Through a more attractive game-centred approach, students learn key skills for both their physical and intellectual development.

Recommendation 4 – The physical education curriculum content should include physical activities according to maturity phases taking into account the favourable periods that allow the full development of neuromotor abilities and skills.

Results from the literature suggest that physical education programmes should take account of gender differences and specific age groups to be effective.

- A study conducted in the US (Cawley et al., 2007)[41] looked into the impact of State Physical Education (PE) requirements on student PE exercise time, whilst exploring the causal impact of State PE laws on overall student physical activity. Drawing on nationwide data, the study found that students with a binding PE requirement reported an average of 31 additional minutes per week spent physically active in PE class. They also found that additional PE time raises the number of days per week that girls reported engaging in vigorous physical activity or strength-building activity. Moreover, the study concludes that raising PE time requirements may increase the physical activity of girls.

- Simen-Kapeu and Veugelers (2010)[42] explored the gender-differentials in overweight and underlying behaviours, nutrition and physical activity, among a group of pre-adolescent pupils in Canada. Through an analysis of survey data conducted on pupils and parents, the findings confirmed the existence of gender differences in physical activity and nutrition: boys were more likely to be

[39] http://www.ncbi.nlm.nih.gov/pubmed/25675352
[40] http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1029156&site=ehost-live
[41] http://www.ncbi.nlm.nih.gov/pubmed/17328052
[42] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2894777/pdf/1471-2458-10-340.pdf

physically active (32%) than girls (20.4%). This study therefore supports a gender-focused approach to health promotion. Results suggest that priority should be given to increasing physical activity among girls and improving healthy eating among boys.

- Similarly, Bardid et al. (2013)[43] conducted an evaluation of a ten-week fundamental motor skill programme in pre-schoolers with motor problems, exploring possible gender differences and the role of the environmental context on the subject group, alongside the use of a control group. The intervention consisted of twenty 60-minute motor skill sessions, in addition to the regular physical education curriculum for pre-schoolers. The intervention was found to be effective in helping 49% of the intervention group in achieving average motor skill levels – a further decline in motor competence was observed in the control group. In addition, the effect of the intervention appeared to be gender-specific, since object control skill improved only in girls of the intervention group.

- Analysis of data collected on physical fitness and physical activity of over 3,500 children and adolescents aged 9 to 19 in Switzerland (Michaud et al., 1999)[44], found that boys were more likely to engage in physical activity than girls (75% compared to 56%) and that engagement in physical activity was lower after age 15 compared to before in both sexes. The study concludes that programmes and strategies aimed at increasing physical activity among school-age persons should be gender-specific and adapt to specific age groups, with greater focus on adolescents aged over 15.

- Eventually, a study on the links between physical fitness and academic achievement among public school students in the US (Castelli et al., 2007)[45] showed that specific components of physical fitness are globally associated with academic performance during maturation, independent of other possible factors, as well as through extended application to younger school-aged children.

Recommendation 5 – Outdoor physical activities and sports should be promoted at all education levels. Along with extra-curricular activities, the physical education curriculum should instil lasting habits of moving regularly in outdoor settings.

- 'The myopia boom' (Dolgin, 2015)[46] analysed the factors behind the prevalence of myopia among children and young adults in East Asia. The report referred to previous epidemiological studies on myopia, which conclusions showed that outdoor activities (not necessary sports) may reduce the risk of developing myopia among children:

  - In Australia, researchers studied more than 4,000 children in Sydney

[43] http://www.ncbi.nlm.nih.gov/pubmed/24183475
[44] http://www.ncbi.nlm.nih.gov/pubmed/10407942
[45] http://www.humankinetics.com/acucustom/sitename/Documents/DocumentItem/7336.pdf
[46] http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=101628585&site=ehost-live

primary and secondary schools for three years. They found that children who spent less time outside were at greater risk of developing myopia, and that time engaged in indoor sports had no such protective association: "higher levels of outdoor activity (sport and leisure activities) were associated with lower myopia prevalence in the 12-year-old students. The lowest odds ratios for myopia, after adjusting for confounders, were found in groups reporting the highest levels of outdoor activity. There were no associations between indoor sport and myopia" (Rose et al., 2008);

- In 2009, Morgan and other researchers from the Zhongshan Ophthalmic Center conducted an experiment to check whether more time spent outside would contribute to protect the eyesight of Chinese children. They launched a three-year trial in which a 40-minute outdoor class was added at the end of the school day for a group of six- and seven-year-olds in six randomly selected schools in Guangzhou – in parallel, children at six other schools had no change in schedule and served as control groups. Among the 900 children who attended outside class, 30% developed myopia by age nine or ten, compared to 40% of those in the control schools (study being prepared for publication);

- In Taiwan, teachers were asked to send children outside for all 80 minutes of their daily break time, instead of giving them the choice to stay inside. After one year, doctors had diagnosed myopia in 8% of the children, compared with 18% at a nearby school (Wu et al., 2013).

- In order to know whether time spent outside has to be imposed by the school, a team of researchers assessed a nine-month programme in Singapore to inform parents of the importance of outdoor time to prevent myopia, including step-counters, organisation of outdoor week-end activities and provision of cash prizes for cooperation. After the experiment, researchers observed that outdoor time was not statistically different from that of a control group with no such campaign (Ngo, C. S. et al., 2014). This suggests that additional outdoor time should be imposed by schools directly, since it may be hard to convince parents to voluntarily send their children outside.

- Jones et al. (2007)[47] tried to identify whether parental history of myopia and/or parent-reported children's visual activity levels can predict juvenile-onset myopia. Through a cohort study of school-aged children recruited at selected ages and seen annually during school grades 1 through 8, the authors observed 514 children between 1989 and 2001 to predict future myopia. Results suggest that "lower amounts of sports and outdoor activity increased the odds of becoming myopic in those children with two myopic parents more than in those children with either zero or one myopic parent. The chance of becoming myopic for children with no myopic parents appears lowest in the children with the highest amount of sports and outdoor activity, compared with those with two

[47] http://www.ncbi.nlm.nih.gov/pubmed/17652719

myopic parents." This study therefore suggested a positive correlation between sports and outdoor activity and a diminished risk of myopia among children.

- These findings were confirmed by a more recent study (French et al., 2013)[48], which examined – through a comprehensive questionnaire – the risk factors for incident myopia in Australian schoolchildren. Results suggested that, while near work and parental myopia were considered as significant risk factors for myopia in the younger cohort, time spent outdoors was negatively associated with incident myopia in both age cohorts. The study showed that "children who became myopic spent less time outdoors compared with children who remained non-myopic, children of East Asian ethnicity had a higher incidence of myopia compared with children of European Caucasian ethnicity and spent less time outdoors." This study suggests that time spent outside (not necessarily physical activity) plays a positive role in the non-development of myopia among children.

- In another meta-analysis – 'Time outdoors and the prevention of myopia' – French et al. (2013)[49] assessed recent epidemiological evidence suggesting that children spending more time outdoors are less likely to become myopic, irrespective of how much near work they do or whether their parents are myopic. Results include:

  - A recent meta-analysis, based on cross-sectional studies of school-aged children, reported that "for each additional hour of time spent outdoors per day, there was a 2% decrease in the odds of myopia" and that "the chance of becoming myopic is reduced by around one third if time spent outdoors is increased from 0,5h per week to 14h or more per week"; and
  - A study from Rose et al. (2008) about the impact of time outdoors on variation in myopia prevalence among children of the same ethnicity between locations (six-year-old children of Chinese ethnicity from Sydney and Singapore) showed that the prevalence of myopia was significantly higher in the children living in Singapore (29%), compared to those living in Sydney (3%): "differences in refraction between Sydney and Singapore were strongly related to time spent outdoors, with Chinese children in Singapore spending an average of only 3h a week outdoors compared to 14h per week for Chinese children in Sydney".

These different studies suggest that children who spend more time outdoors are less likely to become myopic, while deficits in time spent outdoors are reflected in higher prevalence of myopia.

- A recent study (Read et al., 2013)[50] assessed daily light exposure and physical activity levels among 2012 myopic and emmetropic children aged 10 to 15 years in Australia. The key finding is that daily light exposure is significantly higher among emmetropic than myopic children: the former spent on average 36 more

[48] http://www.ncbi.nlm.nih.gov/pubmed/23672971
[49] http://www.ncbi.nlm.nih.gov/pubmed/23644222#
[50] http://www.ncbi.nlm.nih.gov/pubmed/24413273

minutes per day exposed to bright light levels than the latter, and reported between 20 and 40 minutes of additional outdoor time per day. Since "there was no statistically significant difference in physical activity observed between the myopic and emmetropic children, this suggests that the critical factor involved in the previously documented association between outdoor activities and refractive error is more likely to be exposure to higher light levels outdoors, rather than performing higher levels of physical activity." Results of this study therefore suggest that, more than physical activity, exposure to bright outdoor light is the key factor influencing the relation between outdoor activity and myopia.

- Field et al. (2001)[51] studied the links between exercise and adolescents' relationships and academics. They administered a Likert-type questionnaire to 89 high school students in the US to collect information on their exercise habits, relationships with parents and peers, depressive tendencies, sports involvement, drug use, and academic performance. Students were grouped in two groups depending on their level of exercise.

  Results showed that students with a high level of exercise had better relationships with their parents, reported less depression and lower level of drug use, were involved in sports more hours per week, and had higher grade point averages, compared to students with a low level of exercise. These findings therefore suggest that regular participation in physical activity has a positive influence on various aspects of health, well-being and various aspects of daily life.

- Turkish researchers conducted an investigation of aggressive and self-improving humour levels of university students (19-26 years old) doing and not doing sports (Akandere et al., 2015)[52]. The sample group consisted of 50 female and 50 male students from Selcuk University School of Physical Education & Sports and doing sports, and 50 female and 51 male students from Necmettin Erbakan University and not doing sports. Statistical results showed that sport has an effect on the aggressiveness and self-enhancing humour of students: aggressiveness levels were lower and self-enhancing humour levels were higher among students doing sport. In this regard, sport has a positive effect on university students.

- The study 'Investigation of aggressive and self-improving humour levels of Turkish university students doing and not doing sports' (Akandere M. et al., 2015)[53] showed that the aggressiveness of students doing sport was lower and that their level of self-enhancing humour was higher than students not doing sport. The data collected therefore suggest that sport has a positive effect on university students, which should encouraged universities to promote physical activity among students.

[51] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2002062557&site=ehost-live
[52] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2012952540&site=ehost-live
[53] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2012952540&site=ehost-live

- Another study conducted in Turkey (Ermis and Imamoglu, 2013)[54] looked at the effects of sport on the multiple intelligences of university students. For this purpose, 1,580 students (524 of who do regular sports and 1,055 of who do not) from different departments at Ondokuz Mayis University and Ondokuz Mayis Vocational Police High School during the 2010-2011 academic year participated in the study. Findings showed that doing sports regularly has a positive effect on verbal, interpersonal and bodily-kinaesthetic intelligence. In particular:

  > *"Verbal, interpersonal and bodily-kinaesthetic intelligence scores of the students who do sports regularly were significantly higher than the scores of the students who do not;*
  >
  > *While the students who do individual sports had higher logical, intrapersonal and naturalist intelligence scores, the students who do team sports had higher verbal and interpersonal intelligence scores. This difference was statistically significant;*
  >
  > *Doing sport regularly affected the bodily-kinaesthetic and interpersonal intelligence of the male students significantly. It is an expected result for the students who do sport regularly to have higher bodily-kinaesthetic intelligence scores than those who do not."*

- An evaluation of the Indigenous Youth Sports Program (IYSP) in Australia (Macgregor et al., 2015)[55] – which uses sports as a means of engaging Indigenous school students into higher education and enhancing their awareness about university – showed that participation in higher education may be increased by using sports as a medium for career guidance and post-school study pathways, since sport is used as a way to facilitate interactions between schools and Indigenous students. The evaluation demonstrated that the IYSP managed to increase Indigenous secondary school students' knowledge of higher education opportunities and provided them with key information on their career and study options, while, before the programme most of them had no clear perception of post-study career options in five years' time.

  The authors reported that "the absolute number of participants talking to friends about potential career options almost doubled following the IYSP (58 to 94), suggesting that it may have a wider reach to individuals in the region beyond those who attended the programme." In addition, changes in the responses to two statements – 'My education is my ticket to the job or career I want in the future' and 'University is something I can consider anytime in the future' – in the pre- and post-programme survey suggests that the programme succeeded in increasing the participation of Indigenous students in higher education in Australia through the use of sport.

[54] http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=92950320&site=ehost-live
[55] http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=102345174&site=ehost-live

- Field et al. (2001)[56] studied the links between exercise and adolescents' relationships and academics. They administered a Likert-type questionnaire to 89 high school students in the US to collect information on their exercise habits, relationships with parents and peers, depressive tendencies, sports involvement, drug use, and academic performance. Students were grouped in two groups depending on their level of exercise. Results showed that students with a high level of exercise had better relationships with their parents, reported less depression and lower level of drug use, were involved in sports more hours per week, and had higher grade point averages, compared to students with a low level of exercise. These findings therefore suggest that regular participation in physical activity has a positive influence on health, well-being and various aspects of daily life.

- A recent study conducted in Chile (Aguilar et al., 2015)[57] aimed at determining the influence of screen time on the association between physical fitness and academic attainment. For this purpose, 395 seventh-grade primary schoolchildren (average age 12.1) from seven schools were selected, and self-reported physical activity and screen time were evaluated. Results showed that "high academic attainment was associated with higher cardiorespiratory fitness levels" and that this relationship was "weakly impaired by screen time". These findings suggest that parents and policymakers should minimise the negative effects of screen time on children's lives and promote the beneficial effects of healthy habits such as physical activity.

Recommendation 6 – Physical education and extra-curricular activities should foster an ethical education by teaching values such as fair play, cooperation, equity, equality, integrity, peace, human rights, and respect of others' capabilities. Through sport participation, they should also develop relevant skills such as teamwork, social inclusion and leadership, avoiding sport stereotypes.

- Gender equality must be carefully looked at when promoting physical activity among children. Indeed, as highlighted by the 2012 OECD Health at a Glance Europe report[58], "boys tend to be more physically active than girls in all countries, also suggesting that the opportunities to undertake physical activity may be gender-biased". Similar findings were reported by the UNESCO Worldwide Survey of School Physical Education (2013)[59]: "in some countries, there are perceptions that more opportunities are available for boys than for girls, that girls are more reluctant to engage in physical education (physical education kit issues, religion-cultural dispositions, parental discouragement), that there are social barriers and inadequately prepared teaching personnel".

- A study on the levels of physical activity and sedentary time among 10- to 12-year-old boys and girls across five European countries – Belgium, Greece,

[56] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2002062557&site=ehost-live
[57] http://www.sciencedirect.com/science/article/pii/S0021755715000078
[58] http://ec.europa.eu/health/reports/docs/health_glance_2012_en.pdf
[59] http://unesdoc.unesco.org/images/0022/002293/229335e.pdf

Hungary, the Netherlands and Switzerland – (Verloigne et al., 2012)[60] suggested that specific intervention should target girls in priority:

> *"Girls spent significantly more time sedentary (500 min/day) than boys (474 min/day) and significantly less time in light (267 min/day) and moderate-to-vigorous PA (32 min/day) than boys (284 min/day; 43 min/day respectively). Only 4.6% of the girls (compared to 16.8% of the boys) met moderate-to-vigorous PA recommendations of at least 60 min/day".*

- As far as the development of universal ethical values through sport is concerned, a study on the relation between sport participation among young Hungarian aged 15 to 29 and their value preferences (Perényi, 2010)[61] examined the influence of the role and form of sport participation on values. Results suggested that sport participation was negatively correlated with the importance given to materialistic values, while values considered 'open' – such as friendship, creativity, free time, diverse life – were strongly correlated with sport participation. No correlation was identified between values and the form of sport participation (i.e. organised vs. non-organised). Perényi already highlighted in 2008 that[62]:

> *"Our findings reinforce the importance of physical activity as a fundamental element of the socialisation process of Hungarian youth in the shaping of values. Values like true friendship, creativity, interesting life, and diverse life were valued higher among the physically active Hungarian youth, while the physically non-active population preferred values such as wealth/richness."*

- A study on the effects of sport participation on adolescent self-esteem and body-image was conducted in Iceland (Birgir Páll Ómarsson, 2013)[63], on a sample of 1,994 participants from data previously gathered by the Icelandic Centre for Social Research in 2010. Different tools were used, such as the Rosenberg scale to measure participants' self-esteem and the Offer scale to measure participants' body-image. The study also measured participants´ weekly sport participation, as well as type and form of sports they practiced. The key results showed that:
  - Participants who practice sports on a weekly basis have significantly higher self-esteem and body-image than participants who do not (notably males);
  - Participants in individual sports had significantly higher self-esteem than participants in team-sports (no difference was found between males and females);
  - Sport participation has a positive effect on both genders and increased their body-image more by the number of times a week they practiced sports; and
  - Weekly sport participation has an increasing effect on both self-esteem and

[60] http://www.ncbi.nlm.nih.gov/pubmed/22462550/
[61] http://www.tandfonline.com/doi/full/10.1080/17430437.2010.491268
[62] http://idrottsforum.org/articles/perenyi/perenyi081029.pdf
[63] http://skemman.is/stream/get/1946/16684/37828/1/BS-Ritger%C3%B0-Birgir_P%C3%A1ll.pdf

body-image. Sports might be used as an intervention tool for adolescents who suffer from low self-esteem and body-image to improve their well-being.

- Another study on the links between children's sport participation and self-esteem (Slutzky et al., 2009) investigated whether there were correlations between time spent in individual- and/or team-oriented organised sport activities and later self-esteem among 987 elementary school-aged children. Findings indicated that "children who spent more time in team sports, but not time in individual sports, reported higher sport self-concept, which, in turn, was associated with higher self-esteem than their peers." The authors concluded that the relations between time spent in sports and children's sport self-concept partly depends on the form of sport (team or individual sports) in which children participated.

- Turkish researchers conducted an investigation of aggressive and self-improving humour levels of university students (19-26 years old) doing and not doing sports (Akandere et al., 2015)[64]. The sample group consisted of 50 female and 50 male students from Selcuk University School of Physical Education & Sports and doing sports, and 50 female and 51 male students from Necmettin Erbakan University and not doing sports. Statistical results showed that sport has an effect on the aggressiveness and self-enhancing humour of students: aggressiveness levels were lower and self-enhancing humour levels were higher among students doing sport. In this regard, sport has a positive effect on university students.

- In an earlier literature review on the influence of sport and physical education on children and youth's self-esteem (Whitehead et al., 1997)[65], the authors collected evidence of the positive effects of physical activity on self-esteem and motivation. They also reported that both physical activity and physical education programmes could have negative effects on self-esteem and motivation if used inappropriately. The findings suggest that teachers, coaches and other relevant stakeholders should receive specific guidance so that physical education is appropriately implemented.

- The 'Game Sense' pedagogy, which consists in enabling players to practice and improve their skills in a realistic environment under game-like conditions, helps students to learn and develop key skills for their daily environments. Light et al. (2014)[66], who evaluated the Game Sense approach, identified three key dimensions of quality pedagogy on which the approach is based:
  - *"Is fundamentally based on promoting high levels of intellectual quality*
  - *Is soundly based on promoting a quality learning environment; and*
  - *Develops and makes explicit to students the significance of their work."*

[64] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2012952540&site=ehost-live
[65] http://web.b.ebscohost.com/ehost/detail/detail?sid=b06b5a56-2658-4196-85c3-9cdc2c660a07%40sessionmgr198&crlhashurl=login.aspx%253fdirect%253dtrue%2526hid%253d4207%2526db%253dpsyh%2526AN%253d1997-08965-007%2526site%253dehost-live&hid=107&vid=0&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=psyh&AN=1997-08965-007
[66] http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1029156&site=ehost-live

According to the authors, Game Sense is useful because it identifies the central concepts and ideas that students are supposed to learn, as well as the connections between each of these concepts, which go beyond purely technical sports skills: "During game activities students regularly stop and reflect through group discussions that contribute toward the development of understanding to scaffold knowledge and develop skills as the complexity of the games is increased." It can also be used to teach values through playing games: "Game Sense emphasises the importance of affiliation (social interaction, making friends), achievement (doing something well or noticing improvement), and self-direction (opportunities making choices)." This approach provides students opportunities to develop key problem-solving and social skills, which they can use in life situations: "while students learn to be better game players there is also a wide range of social, affective and intellectual learning and development that arises from the process of learning."

Recommendation 7 – The physical education curriculum should include health education concepts like personal and social well-being, health promotion, and healthy lifestyles from a broader perspective beyond the practice of physical activity and sport. Physical education teachers should also cooperate closely with other disciplines in school to fully develop these concepts among the education community.

- The 2012 OECD Health at a Glance in Europe report[67] argues that exercising physical activity in adolescence has benefits for health and influences adult physical activity levels and health outcomes in later life. The report highlights "the role that physical activity has in child and adolescent development, learning and wellbeing, and in the prevention and treatment of a range of youth health issues including asthma, mental health, bone health and obesity."

  According to the OECD, childhood is a key period to form healthy behaviours. Schools, through focused interventions targeting children, can change behaviours by helping children to understand the importance of physical education and healthy behaviours. The same report points out the rising problem of obesity among European children: "average reported rates of excess weight and obesity have increased in most EU member states (from 11% in 2001-02 to 13% of 15-year-olds in 2009-10). The largest increases were found in the Czech Republic, Estonia, Poland, Romania and Slovenia, while more than 15% of adolescents in Greece, Italy, Portugal, Spain, Croatia, Iceland, Luxembourg and Slovenia reported being overweight or obese. Only Denmark and the UK reported significant reductions in the proportion of overweight or obese."

- In 2006, the Memphis Grizzlies (an American basketball team) launched 'Get Fit with the Grizzlies', a six-week programme focusing on nutrition and physical

[67] http://ec.europa.eu/health/reports/docs/health_glance_2012_en.pdf

activity for the 4th and 5th grades' students of Memphis City Schools. Both local and national were solicited to fund the programme. The multinational Kellogg's also joined the programme as the primary sponsor. During the 2010-11 school-year, the programme was turned into 'Healthy Home Court', which added a breakfast component to the original fitness part of the programme, in the form of 'carts' with healthy breakfast options (e.g. fruits, protein bars) for pupils.

- Researchers Irwin et al. (2012)[68] conducted survey research over four years to measure the health knowledge acquisition and behaviour change in the Memphis area. The researchers found significant improvements in health knowledge and health behaviour after the intervention. In addition, students who attended the breakfast assembly gained knowledge about healthier eating and positively changed their attitude towards the academic and health benefits of health eating.

- A study of the early life risk factors for obesity in childhood in the UK (Reilly et al., 2005)[69] identified eight early life factors that are associated with an increased risk of obesity in childhood, namely "parental obesity, very early (by 43 months) body mass index or adiposity rebound, more than eight hours spent watching television per week at age 3 years, catch-up growth, standard deviation score for weight at age 8 months and 18 months, weight gain in first year, birth weight per 100 g, and short (< 10.5 hours) sleep duration at age 3 years."

  The authors of the study found that sleep duration may have effects on obesity, since "night time sleep may be a marker for some other variable such as level of physical activity – that is, children who are more physically active may sleep longer at night." Their research showed that the duration of sleep among children aged 30 months was independently associated with prevalence of obesity at age 7: "children in the lowest two quarters of sleep duration (< 10.5 hours) were more likely to be obese at age 7 than children in the highest quarter (> 12 hours)".

  They also highlighted the impact of sedentary behaviours on health, notably the role played by television viewing, "because large amounts of time spent sedentary may contribute to impairment of the regulation of energy balance by uncoupling food intake from energy expenditure". Findings showed that the likeliness to become obese increased linearly with the number of hours of television viewing: "for children who reported to watch television for 4-8 hours per week at age 3, the adjusted odds ratio for obesity at age 7 was 1.37. For those reported to watch more than eight hours per week, the adjusted odds ratio was 1.55".

  These results provide evidence of the role of the early life environment in the

[68] http://www.ncbi.nlm.nih.gov/pubmed/22910518
[69] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC558282/

later risk of obesity. They suggest that prevention and intervention strategies should be developed, notably at school level, to counter these negative correlations.

1.3. Inclusive approach

Recommendation 8 – Everyone should be able to participate in physical education and extra-curricular activities through inclusive, differentiated and adapted methodologies and activities, including less active and less skilled children. Children with a disability or special educational needs should be offered adapted activities and not be excluded.

- The 2012 OECD Health at a Glance in Europe report[70] argues that exercising physical activity in adolescence has benefits for health and influences adult physical activity levels and health outcomes in later life. The report highlights "the role that physical activity has in child and adolescent development, learning and wellbeing, and in the prevention and treatment of a range of youth health issues including asthma, mental health, bone health and obesity."

  According to the OECD, childhood is a key period to form healthy behaviours. Schools, through focused interventions targeting children, can change behaviours by helping children to understand the importance of physical education and healthy behaviours. The same report points out the rising problem of obesity among European children: "average reported rates of excess weight and obesity have increased in most EU member states (from 11% in 2001-02 to 13% of 15-year-olds in 2009-10). The largest increases were found in the Czech Republic, Estonia, Poland, Romania and Slovenia, while more than 15% of adolescents in Greece, Italy, Portugal, Spain, Croatia, Iceland, Luxembourg and Slovenia reported being overweight or obese. Only Denmark and the UK reported significant reductions in the proportion of overweight or obese."

- Results of the above-mentioned study on the links between physical fitness and academic achievement (Castelli et al., 2007)[71] suggest that schools, particularly at elementary level, should provide appropriate opportunities for children to be physically active and become physically fit: "physical education, among other physical activity opportunities surrounding a school day (i.e., active recess, both before- and afterschool programmes), is positioned to play an important role in addressing public health issues." Schools need to define clearly which curricular components have the greatest impacts.

- Field et al. (2001)[72] studied the links between exercise and adolescents'

[70] http://ec.europa.eu/health/reports/docs/health_glance_2012_en.pdf
[71] http://www.humankinetics.com/acucustom/sitename/Documents/DocumentItem/7336.pdf
[72] http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=2002062557&site=ehost-live

relationships and academics. They administered a Likert-type questionnaire to 89 high school students in the US to collect information on their exercise habits, relationships with parents and peers, depressive tendencies, sports involvement, drug use, and academic performance. Students were grouped in two groups depending on their level of exercise. Results showed that students with a high level of exercise had better relationships with their parents, reported less depression and lower level of drug use, were involved in sports more hours per week, and had higher grade point averages, compared to students with a low level of exercise. These findings suggest that regular participation in physical activity has a positive influence on health, well-being and various aspects of daily life.

- One recent article (Mura et al., 2015)[73] summarises the evidence of the effectiveness of school-based interventions aiming at promoting, enhancing and implementing physical activity in European schools. This systematic review included 47 randomised controlled trials carried out in Europe between 2000 and 2014, universally delivered and targeting pupils aged between 3 and 18 years old. The article concluded that physical education can be associated with psychological and social health benefits for youths, such as increased self-esteem and lower depression and anxiety: "physical activity in schools should be regarded as a simple, non-expensive and enjoyable way to reach all the children and adolescents with adequate doses of moderate to vigorous physical activity."

- The evaluation of 'Be Active Kids' (De Marco et al., 2015)[74], a physical activity programme for children in child care settings accompanied by a teacher training component (North Carolina, US), showed that such a programme can enhance the level of physical activity of very young children. Prior to the introduction of the programme, activity in these child care centres was very limited. Results showed that, from pre- to post-intervention, moderate-to-vigorous physical activity increased in four of the six classrooms, while sedentary physical activity decreased in five. As reported by the authors, "the biggest increases in physical activity were found during teacher-directed activity, when moderate-to-vigorous and light activity increased in five and six classrooms, respectively." These findings suggest that teacher training has a positive influence on the improvement of physical activity in child care settings. Teachers may be more comfortable providing physical activity lessons to children when they know these are appropriate to promote healthier child outcomes.

- As pointed out by Pontifex et al. (2014)[75], "recent findings suggest that physical activity occurs less frequently in children with Attention Deficit Hyperactivity Disorder (ADHD), posing a challenge to employing physical activity interventions. Children with developmental disorders, such as ADHD and autism spectrum disorders (ASD), have been found to exhibit lower physical activity participation levels than the general pediatric population. It will therefore be

[73] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4378026/
[74] http://www.beactivekids.org/assets/downloads/EarlyEducationDevelopmentArticle.pdf
[75] http://onlinelibrary.wiley.com/doi/10.1111/mono.12132/abstract

important to determine the antecedents of and barriers to physical activity behaviours in children with ADHD in order to develop best practice recommendations for engaging this population". Sport may be beneficial for children with ADHD (as demonstrated below), but one key issue remains to engage these children in physical activity.

- Pontifex et al. (2014) refer to a growing body of research evidence suggesting that the use of physical activity may be beneficial for children with ADHD, notably:

  - Etscheidt and Ayllon (1987) asked a 13-year-old boy who exhibited symptoms of hyperactivity and distractibility to engage in moderate-to-vigorous levels of activity for a short duration (5 to 15 minutes) whenever he recognised he was exhibiting disruptive behaviours. Following activity, the boy was observed to exhibit greater attentiveness in the classroom;
  - Azrin, Ehle, and Beaumont (2006) observed the effects of regular physical activity breaks on the behaviour of an un-medicated 4-year-old boy with ADHD and comorbid symptoms of autism. The child exhibited enhanced attentiveness and reduced hyperactivity when provided with regular access to playground equipment to engage in vigorous activity; and
  - Medina et al. (2010) observed greater sustained attention and decreased impulsivity using a continuous performance task in a sample of 25 boys diagnosed with ADHD following 30 minutes of high-intensity aerobic exercise. These improvements were attained regardless of medication status.

- Pontifex et al. also refer to research on the positive effects of acute exercise and inhibitory control on children and young adults: "improvements in performance on tasks that tap aspects of inhibition (i.e., flanker, Stroop, and the Paced Auditory Serial Addition Test) following participation in a single bout of structured physical activities lasting at least 20 minutes (Hillman, Buck, et al., 2009; Hillman et al., 2003; Hogervorst, Riedel, Jeukendrup,&Jolles, 1996; Kamijo, Nishihira, Higashiura, & Kuroiwa, 2007; Lichtman & Poser, 1983; Sibley, Etnier, & Le Masurier, 2006; Tomporowski et al., 2005)." This evidence suggests that single bouts of exercise may be beneficial to correct cognitive deficits that prevent children with ADHD from learning efficiently.

- Pontifex et al. make reference to a cross-sectional investigation of boys aged 12 years who received pharmacological treatment for ADHD: "time spent in moderate-to-vigorous physical activity over a seven-day period was associated with better performance on tests of cognitive control (Gapin & Etnier, 2010)." They refer to a study from Smith et al. (2013), who "piloted a before-school physical activity intervention in a sample of medication naıve children aged 5 to 8 years at risk of ADHD. Participants completed a morning program every school day for 8 weeks that exposed children to approx. 26 minutes of continuous moderate-to-vigorous physical activity per session. Reductions were observed in inattention and over-activity, in parallel to improvements in inhibition and peer interactions". Another study examined children aged 7-12 years diagnosed with

ADHD, and demonstrated group differences between those exposed to a 45-minutes physical activity program 3 days per week over 10 weeks and control participants (Verret, Guay, Berthiaume, Gardiner, & Beliveau, 2012): children in the treatment group improved information processing, visual search and sustained attention, and reduced social and attentional problems.

- Other research studies, mentioned in Pontifex et al., suggest that short periods of exercise may be effective to enhance classroom performance for children with ASD:

  - Rosenthal-Malek and Mitchell (1997) observed "enhancements in appropriate responding and task completion in a mock classroom environment following a 20-minutes bout of moderately intense jogging, relative to following 20 minutes of academic instruction, in a sample of five adolescents with autism"; and
  - Kern, Koegel, Dyer, Blew, and Fenton (1982) "examined the effect of single bouts of physical activity on classroom behaviour in a sample of seven preadolescent children with autism using a simultaneous-treatments design occurring over a 21-day span. Findings revealed that 15–20 minutes of moderate intensity jogging reduced off-task behaviours and increased compliance with instructions relative to baseline measures (Kern et al., 1982)."

- Pontifex et al. referred to one recent meta-analysis of 16 investigations, which "suggested that repeated bouts of exercise result in more persistent improvements in social skills and reductions in stereotypical behaviours in children with ASD (Sowa & Meulenbroek, 2012). Utilising a 10-week water-based exercise programme, Pan (2010) observed reductions in antisocial behaviours in a sample of 16 preadolescent children with ASD, as well as parent-reported improvements in their child's self-confidence and self-efficacy toward social and athletic opportunities. Importantly, these improvements persisted for ten weeks following the intervention. These findings are consistent with the observations of Duronijic´ and Valkova (2010), who used qualitative and quantitative methodologies to examine the effects of 60 minutes of physical activity twice a week for 8 weeks on children with ASD. The intervention resulted in improvements in both motor and social skills."

- A study conducting by Silva et al. (2015) aimed at measuring and quantifying the effectiveness of physical activity on the concentration of individuals with Attention Deficit Hyperactivity Disorder (ADHD) in Brazil. The effect of physical activity on children's attention was measured as follows: 28 volunteers – 14 with ADHD (GE-EF) and 14 without ADHD symptoms (GC-EF) – participated in a five-minute relay race without a rest interval. After five minutes of rest, they accessed a computer game to accomplish specific tasks in the shortest possible time. The computer game was also accessed by another 28 volunteers: 14 with ADHD (GE) and 14 without these symptoms (GC). Researchers measured the time used to solve the tasks requiring attention, and compared the results of the

four groups. Results showed an "improved attention among students with ADHD who experienced intense exercise in a short time interval (approximately 5 min)", thus suggesting that children with ADHD symptoms "may have equivalent concentration to individuals without the disorder after physical exertion."

The authors concluded on the positive influence of physical exercise on children's attention and impulse control:

- "the group with ADHD which participated in the physical activity (GE-EF) obtained 30.52% better performance than the group with signs of ADHD that did not participate in physical activity (GE), and 40.36% better than the group without characteristic of ADHD that participated in physical activity (GC-EF);
- the group that more rapidly reached the goal proposed by the assessment game was that group without characteristic of ADHD and not involved in physical activity proposed (GC), ending the testing game 2.5% faster than the GE-EF group; and
- the (GE-EF) group showed similar performance (2.5% difference) with the volunteers in the (GC) group who have no ADHD symptoms and did not exercise".

1.4. Injury prevention

Recommendation 9 – Planned and well-designed physical education classes should integrate safety strategies and prevention measures in order to reduce the odds of injury and improve risk management.

- A study by Collard et al. (2010)[76] investigated the effects of the 'iPlay' school-based physical activity-related injury programme on risk behaviour and neuromotor fitness. It found that the iPlay programme was not able to significantly improve injury-preventing behaviour, although the programme did significantly improve knowledge and attitude, two determinants of behaviour. The effect of the intervention programme on behaviour appeared to be significantly mediated by knowledge and attitude. Improved scores on attitude, social norm, self-efficacy and intention were significantly related to changes in injury preventing behaviour. Furthermore, iPlay resulted in small non-significant improvements in neuromotor fitness in favour of the intervention group.

- Goossnes et al. (2015)[77] conducted a study that investigated the efficacy of a multifactorial injury prevention intervention on injury incidence reduction in Physical Education Teacher Education (PETE) students. The results showed that there was a trend towards significantly lower incidence rate (2.18 vs. 2.73; p = 0.061) in the intervention group compared with the control group: students in the intervention group had significantly less acute, first-time and extracurricular injuries. The largest reduction was observed for injuries during unsupervised practice sessions. A multifactorial injury prevention intervention embedded into a regular PETE programme is a promising and feasible strategy to prevent injuries in PETE students. Further research is needed to investigate whether the results may be generalised to other PETE programmes.

- The FIFA 11+ training programme provided amateur footballers with simple warm-up exercises to prevent injury. Researchers conducted a systematic review to establish the effectiveness of the programme. They found considerable reductions in the number of injured players, ranging between 30% and 70%, among the team that implemented the programme. In addition, players with high compliance to the FIFA 11+ had an estimated risk reduction of all injuries by 35% and showed significant improvements in components of neuromuscular and motor performance when participating in structured warm-up sessions at least 1.5 times/week[78].

[76] http://web.a.ebscohost.com/ehost/detail/detail?sid=8c6d8fc1-4509-476c-803b-f67292f560cf%40sessionmgr4002&vid=0&hid=4212&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&AN=49158757
[77] http://www.tandfonline.com/doi/abs/10.1080/17461391.2015.1015619?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed
[78] http://web.a.ebscohost.com/ehost/detail/detail?sid=fc132939-1a7f-4eb1-b6dc-04b2e47a2ee2%40sessionmgr4003&vid=0&hid=4104&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=mnh&AN=25415209

- Similarly, Herman et al. (2012)[79] conducted a systematic review to investigate neuromuscular warm-up strategies and injury prevention. The study found that the implementation of practical neuromuscular warm-up strategies can reduce lower extremity injury incidence. This is typically a warm up strategy that includes stretching, strengthening, balance exercises, sport drills and landing techniques for three consecutive months or longer.

- Finally, in the UK, researchers conducted a systematic review and meta-analysis to evaluate the efficacy of injury prevention neuromuscular training strategies in youth sport. They found that, although not statistically significant, the point estimate suggests a protective effect of such programmes in reducing the risk of knee injury (IRR=0.74 (95% CI 0.51 to 1.07)). There is evidence for the effectiveness of neuromuscular training strategies in the reduction of injury in numerous team sports. Lack of uptake and ongoing maintenance of such programmes is an ongoing concern. A focus on implementation is critical to influence knowledge, behaviour change and sustainability of evidence informed injury prevention practice.[80]

1.5. Physical education taught time

Recommendation 10 – The minimum physical education taught time recommended during compulsory education period should be increased to at least 5 lessons per week (~ 5 hours). The physical education curricular structure and goals should be adjusted accordingly, defining tangible and flexible outcomes for each developmental stage, and suggesting the inclusion of realistic activities.

- Despite international recommendations, evidence shows that only few children in Europe meet the moderate-to-vigorous physical activity recommendations of at least 60 minutes per day. As highlighted by the 2012 OECD Health at a Glance Europe report, "only one-in-five children in EU member states report that they undertake moderate-to-vigorous exercise regularly." The report also underlines significant differences between Member States, suggesting that the recommendation could also be based on Member States' specificities.

- One study (Verloigne et al., 2012)[81] conducted in five European countries – Belgium, Greece, Hungary, the Netherlands and Switzerland – assessed the levels of sedentary time and physical activity among children aged 10 to 12 and examined differences by gender (see Recommendation 8) and country. Results showed that "large proportions of children did not meet the recommendations of 60 minutes MVPA per day and spent approximately eight hours per day being

[79] http://web.a.ebscohost.com/ehost/detail/detail?sid=d927103e-8024-4a3b-a096-4727e49d3862%40sessionmgr4005&vid=0&hid=4104&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&AN=78332655
[80] http://bjsm.bmj.com/content/49/13/865.long
[81] http://www.ncbi.nlm.nih.gov/pubmed/22462550/

sedentary". The authors concluded by advising authorities and schools to develop obesity prevention programmes focusing on promoting PA and reducing sedentary time, such as "interventions focusing particularly on reducing sitting time, next to promoting PA".

- A recent systematic review on tracking physical activity and sedentary behaviour in childhood (Jones et al., 2013)[82] highlighted the need to establish recommended levels of physical activity and sedentary behaviour during the early years of life (between birth and six years). They recommended that (i) "early childhood should be targeted as a critical time to promote healthy lifestyle behaviours through methodologically sound prevention studies"; and that (ii) "future tracking studies should assess a broad range of sedentary behaviours using objective measures."

- A study conducted in the US (Cawley et al., 2007)[83] looked into the impact of State Physical Education (PE) requirements on student PE exercise time, whilst exploring the causal impact of State PE laws on overall student physical activity. Drawing on nationwide data, the study found that students with a binding PE requirement reported an average of 31 additional minutes per week spent physically active in PE class. They also found that additional PE time raises the number of days per week that girls reported engaging in vigorous physical activity or strength-building activity. Moreover, the study concludes that raising PE time requirements may increase the physical activity of girls.

- Another literature review covering France, the UK and the US (Reilly et al., 2008)[84] reported that, with a view to prevent and treat child and adolescent obesity, targeting a reduction in sedentary behaviour may be more effective than targeting increases in physical activity (Gortmaker SL et al. (1999); Robinson TN (1999)): "sedentary behaviour presumably makes a direct contribution to increasing obesity risk by lowering habitual physical-activity energy expenditure, by displacing physically-active behaviour and possibly via effects on energy intake."

  The review also reports that existing evidence on physical activity suggests that the "levels of habitual physical activity are typically much lower than current recommendations of 60 min moderate–vigorous intensity physical activity daily (activity at an intensity at least three times the individual's resting energy expenditure)." The authors refer to systematic reviews that "have concluded repeatedly that reductions in screen time are beneficial as a strategy in childhood and adolescent obesity prevention and treatment, and a target (maximum) of 2 hrs/day non-academic screen time has been recommended widely for some time for older children and adolescents (Summerbell CD et al.

[82] http://www.ncbi.nlm.nih.gov/pubmed/23683983
[83] http://www.ncbi.nlm.nih.gov/pubmed/17328052
[84] http://journals.cambridge.org/download.php?file=%2FPNS%2FPNS67_03%2FS0029665108008604a.pdf&code=6d119f48de7ee3fc5e74d9e8bd98cb77

(2005); Barlow SE & Dietz WH (1998)".

1.6. Exemptions from physical education

Recommendation 11 – Physical education is a necessary part of school curriculum, and exemptions should only be granted in extraordinary circumstances. In most cases, participation should be ensured with the use of inclusive, differentiated and adapted activities.

No evidence was identified to back up this recommendation.

1.7. Assessment in physical education

Recommendation 12 – Physical education should consider the possibility of including an evaluation based on personal progress and achievements to complement both formative and summative methods. Physical education teachers should provide effective and regular feedback, within defined learning outcomes.

- A recent article (Fencl, 2014)[85] reviewed alternative modes of assessment for all K-12 grade levels (primary and secondary education) in the US. The article highlighted the possibility for teachers to use diverse assessment modes, including fun and creative methods, to address the diversity of learning styles in the classroom and help students increase their performance outcomes. The authors concluded that enabling students to choose their assessment preference depending on their personal strengths and interests can give them a sense of ownership and enhance their motivation for a successful completion of the assessment project.

- Another example of alternative mode of assessment comes from 'Game Sense', which can be considered as an innovative teaching and assessment approach to physical education, which uses games at the centre of the class. This approach encourages students to develop skills in a realistic context, make more tactical decisions and have more fun. It was developed in Australia and has been used there and in the US notably. One study from Light et al. (2014)[86] considered 'Game Sense' as a model for delivering quality teaching in physical education. The authors reported that:

> *"Game Sense could be adopted to provide quality teaching and learning in games. It could offer guidelines for providing quality pedagogy in other areas of the practical curriculum and realising the relatively untapped potential that the practical content of PE curricula holds for providing high quality learning of relevance well beyond merely learning*

[85] http://web.b.ebscohost.com/ehost/detail/detail?sid=ac7e5d3b-a250-4f5b-940e-15894d2b6487%40sessionmgr113&crlhashurl=login.aspx%253fdirect%253dtrue%2526db%253deric%2526AN%253dEJ1031415%2526site%253dehost-live&hid=118&vid=0&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=eric&AN=EJ1031415

[86] http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1029156&site=ehost-live

to play games, throw a javelin or pass a netball with speed and accuracy to provide the significance of learning. Given the difficulties involved in changing practice from directive, skill based approaches to Game Sense and other student-centred, inquiry-based pedagogy we are not making a simplistic claim that Game Sense can be the saviour of physical education. We are, however, arguing that it provides a positive direction to work toward and suggesting that the challenge might well be worth the effort."

By focusing on the intellectual elements of the game, this approach differs from traditional directive technical approaches focusing on achieving results only, as students learn through engaging with the environment. Through Game Sense teaching, teachers create a specific physical and social learning environment where students can engage to explore, experiment, analyse and solve a range of issues that may arise through playing games. This approach may therefore be used to assess students beyond their quantitative physical results, for instance by checking if they understand what they learn and how they can use it in their daily life, i.e. outside school and aside from sport. As the authors pointed out:

"Providing a quality learning environment focuses on the need to make students aware of expectations for learning. This involves students having the opportunity to exercise control over what and how they learn. Students demonstrate this through engagement in learning, self-regulation and self-direction. This is not limited to seeing how particular skills or tactical knowledge learnt in physical education classes can improve performance in sport outside school. Significance needs to go beyond this to demonstrate how broader and deeper learning developed in physical education classes is applicable in their lives outside sport and recreation."

1.8. Physical education teachers

Recommendation 13 – Qualified and specialised physical education teachers should be preferred at all educational levels. When not possible, as a minimum, qualified physical education teachers or certified coaches should counsel and support general teachers.

- The UNESCO Worldwide Survey of School Physical Education (2013)[87] reports deficiencies in terms of teacher supply, notably of physical education specialists. The report also highlights "inadequate preparation of physical education teachers, especially, but not exclusively so, in primary/elementary schools", as well as "negative attitudes and low levels of motivation of some teachers responsible for physical education delivery." A general concern can thus be raised about the quality of physical education teacher training, the availability of

[87] http://unesdoc.unesco.org/images/0022/002293/229335e.pdf

teaching resources, inadequate supervision of practice and lack of professionalism, which all have impacts on the quality provided at school level.

- The 2013 Eurydice report on 'Physical Education and Sport at School in Europe'[88] mentions the diverse situations of Member States regarding the involvement of sport coaches in physical education classes. For instance, in Germany, France and Ireland generalists who teach physical education at primary level may be assisted by a sports coach or advisor employed by the school. In Ireland, generalists coaching qualifications or special interest in a particular sport are sometimes deployed to teach physical education (approx. one-third of teachers at this level). In Malta, outside coaches can hold physical education sessions with primary pupils.

  The report provides an example of a large-scale initiative in the UK (Wales), which involves coaches in teaching physical education at school: the 'Dragon Multi-Skills and Sport' programme[89] introduces children aged 7-11 to coaching, skills development and appropriate competition using modified versions of adult games to reflect their needs and skill levels. Learning resources for the programme include volunteer parents, teachers and external coaches, who are used to develop opportunities outside the school curriculum and in the community. Teachers can liaise with coaches to use them as resources in physical education lessons.

- A study by Flintoff et al. (2011)[90] explored the perceptions of good practice in physical education and school sport among experienced coordinators across eight school sport partnerships in England. The study found that good practice was often underpinned by educational rather than performance pedagogy, linked to wider school agendas. In particular, sustainability of good practice was linked to factors such as the continuing professional development of non-specialist primary school teachers.

- One exploratory case study on the coupling of elite sport and school (Borggrefe and Cachay, 2012)[91] examined the German 'Verbundsysteme', a form of cooperation between schools and organised sports which was established to promote talented school-aged athletes and enhance student success chances in dual careers. One of the key elements of the 'Verbundsystem', as highlighted in this case study, is the involvement of key actors from elite sport in designing and developing the curriculum in these Special Sports Schools. Steering committees, composed of teacher-coaches from the school, representatives of sports associations, and coaching experts, have been set up to further develop the curricula of these schools, and to recruit talented young athletes.

[88] http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/150EN.pdf
[89] http://sport.wales/community-sport/education/dragon-multi-skills--sport.aspx
[90] http://epe.sagepub.com/content/17/3/341.abstract
[91] http://www.ejss.ch/PDF-Dateien/ejss2012_Vol9_Issue1+2_Borggrefe-Cachay_Dual%20Careers-The%20Structural%20Coupling%20of%20Elite%20Sport%20and%20School-Exemplified%20by%20the%20German%20Verbundsysteme.pdf

The authors of the case study conclude by highlighting the importance of "anchoring elite sport training in the school system, which appears highly attractive since it ensures that sport has reliable access to important resources, above all staff, sports facilities, and time." The special status granted to these schools, the possibility to employ teacher-coaches, and the ability of schools to take autonomous decisions about their pedagogical orientation, are crucial success factors for their success.

- One international review (Radtke and Coalter, 2007), which collected available evidence on the policies and practices of sports schools, showed that key factors for the success of such schools included providing elite coaching, maintaining close coordination with the elite pupils' local team/sports club and coaches, and ensuring easy access to quality facilities, coaches and services.

- In an earlier literature review on the influence of sport and physical education on children and youth's self-esteem (Whitehead et al., 1997)[92], the authors collected evidence of the positive effects of physical activity on self-esteem and motivation. They also reported that both physical activity and physical education programmes could have negative effects on self-esteem and motivation if used inappropriately. The findings suggest that teachers, coaches and other relevant stakeholders should receive specific guidance so that physical education is appropriately implemented.

Recommendation 14 – National education coordinating bodies should promote quality changes in the training curricula of physical education teachers, both in initial formation and continuous education, in order to improve and expand those teachers' knowledge and competences in a variety of relevant subjects.

- One exploratory case study on the coupling of elite sport and school (Borggrefe and Cachay, 2012)[93] examined the German 'Verbundsysteme', a form of cooperation between schools and organised sports which was established to promote talented school-aged athletes and enhance student success chances in dual careers. One of the key elements of the 'Verbundsystem', as highlighted in this case study, is the involvement of key actors from elite sport in designing and developing the curriculum in these Special Sports Schools. Steering committees, composed of teacher-coaches from the school, representatives of sports associations, and coaching experts, have been set up to further develop the curricula of these schools, and to recruit talented young athletes.

  The authors of the case study conclude by highlighting the importance of "anchoring elite sport training in the school system, which appears highly

[92] http://web.b.ebscohost.com/ehost/detail/detail?sid=b06b5a56-2658-4196-85c3-9cdc2c660a07%40sessionmgr198&crlhashurl=login.aspx%253fdirect%253dtrue%2526hid%253d4207%2526db%253dpsyh%2526AN%253d1997-08965-007%2526site%253dehost-live&hid=107&vid=0&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=psyh&AN=1997-08965-007

[93] http://www.ejss.ch/PDF-Dateien/ejss2012_Vol9_Issue1+2_Borggrefe-Cachay_Dual%20Careers-The%20Structural%20Coupling%20of%20Elite%20Sport%20and%20School-Exemplified%20by%20the%20German%20Verbundsysteme.pdf

attractive since it ensures that sport has reliable access to important resources, above all staff, sports facilities, and time." The special status granted to these schools, the possibility to employ teacher-coaches, and the ability of schools to take autonomous decisions about their pedagogical orientation, are crucial success factors for their success.

- A study by van Beurden et al. (2003)[94] examined the effectiveness of the 'Move it groove it' programme on improving child fundamental movement skills (FMSs) and increasing physical activity. A whole school approach to implementation included establishment of school project teams, a teacher "buddy" system, a project Website, teacher training workshops and small grants for equipment. Researchers found that the intervention delivered substantial improvements in every FMS for both genders, ranging from 7.2% to 25.7% (13 of 16 comparisons were significant). For PA level, mean MVPA at baseline was 34.7%. Baseline moderate to vigorous PA (MVPA) for boys was 38.7%, and it was 33.2% for girls. The intervention was associated with a non-significant 4.5% increase in MVPA and a significant 3.0% increase in VPA. This translated into a gain of <1 minute of MVPA per average 21-minute lesson. The authors concluded by saying that "by modifying existing PE lessons, significant improvements in FMS mastery can be gained without adversely affecting children's MVPA and VPA. To increase PA levels, we recommend increasing the number of PE lessons per week."

- Slater et al. (2012)[95] examined the impact of State and school district-level policies on the prevalence of physical education and recess in a nationally representative sample elementary schools in the US. The study found that the likelihood of schools having 150 minutes of weekly Physical Education (PE) increased if they were located in States or school district which had a law or policy requiring 150 minutes of PE weekly. Also, schools located in states with laws encouraging daily recess were significantly more likely to have 20 minutes of recess a day. However, adequate PE time was inversely associated with recess and vice versa, suggesting that schools are substituting one form of physical activity for another rather than providing the recommended amount of both recess and PE. Overall, the study concluded that, by mandating PE or recess, policymakers can effectively increase school-based physical activity opportunities for youth.

- A study conducted in the US (Cawley et al., 2007)[96] looked into the impact of State PE requirements on student PE exercise time, whilst exploring the causal impact of State PE laws on overall student physical activity. The study found that students with a binding PE requirement reported an average of 31 additional minutes per week spent physically active in PE class. They also found that additional PE time raises the number of days per week that girls reported engaging in vigorous PA or strength-building activity. Moreover, the study

[94] http://www.sciencedirect.com/science/article/pii/S0091743502000440
[95] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3523123/pdf/nihms-424593.pdf
[96] http://www.ncbi.nlm.nih.gov/pubmed/17328052

concludes that raising PE time requirements may increase the physical activity of girls.

1.9. Monitoring of physical education

Recommendation 15 – National education coordinating bodies and schools should support the development and implementation of methods to ensure the compliance with and the high quality of the physical education curriculum.

- Slater et al. (2012)[97] examined the impact of State and school district-level policies on the prevalence of physical education and recess in a nationally representative sample elementary schools in the US. The study found that the likelihood of schools having 150 minutes of weekly Physical Education (PE) increased if they were located in States or school district which had a law or policy requiring 150 minutes of PE weekly. Also, schools located in states with laws encouraging daily recess were significantly more likely to have 20 minutes of recess a day. However, adequate PE time was inversely associated with recess and vice versa, suggesting that schools are substituting one form of physical activity for another rather than providing the recommended amount of both recess and PE. Overall, the study concluded that, by mandating PE or recess, policymakers can effectively increase school-based physical activity opportunities for youth.

- A study conducted in the US (Cawley et al., 2007)[98] looked into the impact of State PE requirements on student PE exercise time, whilst exploring the causal impact of State PE laws on overall student physical activity. Drawing on nationwide data, the study found that students with a binding PE requirement reported an average of 31 additional minutes per week spent physically active in PE class. They also found that additional PE time raises the number of days per week that girls reported engaging in vigorous physical activity or strength-building activity. Moreover, the study concludes that raising PE time requirements may increase the physical activity of girls.

1.10. Extracurricular activities and activities outside physical education curriculum

Recommendation 16 – Schools, alone or accompanied by other relevant organisations should promote and increase the availability of physical activities outside physical education curriculum (e.g. physical activity and sport, active breaks) including the implementation of the active school concept.

- The World Health Organisation (WHO), in its 2010 'Global recommendations on physical activity for health,'[99] recommended that children and young people (5-17 years) do at least 60 minutes of moderate to vigorous-intensity physical activity per day, based on scientific evidence proving that physical activity

[97] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3523123/pdf/nihms-424593.pdf
[98] http://www.ncbi.nlm.nih.gov/pubmed/17328052
[99] http://whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf?ua=1

provides strong health benefits. Furthermore, the WHO recommends that activities for children and young people should include games and play, sports, recreation, physical education or planned exercise at different levels, e.g. family, school and community. In the same report, the WHO refers to observational and experimental studies, which found that "higher levels of physical activity were associated with more favourable health parameters and improvements in health indicators". The WHO notably highlighted the following:

> *"The documented health benefits include increased physical fitness (both cardiorespiratory fitness and muscular strength), reduced body fatness, favourable cardiovascular and metabolic disease risk profiles, enhanced bone health and reduced symptoms of anxiety and depression. Maintaining high amounts and intensities of physical activity starting in childhood and continuing into adult years will enable people to maintain a favourable risk profile and lower rates of morbidity and mortality from cardiovascular disease and diabetes later in life."*[100]

- One recent study from Haapala (2014)[101], which investigated the links between different types of physical activity and sedentary behaviour with reading and arithmetic skills among 186 children aged six to eight years in Finland, showed that physical activity was associated with reading fluency and that pupils who participated in any organised sports (Grade 1) had better arithmetic skills (Grades 1–3) than those who did not do any sports. The study also showed that "physically active school transportation in Grade 1 was directly related to reading fluency in Grades 1–3 and reading comprehension in Grade 1" but that, among girls, "unsupervised PA in Grade 1 was inversely related to reading fluency in Grade 2". The authors concluded that higher levels of PA were associated with enhanced attention, concentration and on-task behaviour, which may increase academic achievement among pupils. Although engagement in organised sports was related to better arithmetic skills in the whole sample of children, the authors warned that "only some types of PA may improve academic skills among children".

  The authors highlighted strong evidence-based intervention studies that have demonstrated that implementing 90 minutes of moderate-to-vigorous physical activity per week within a school day, adding 60 minutes of physical education per day or increasing after-school physical activity for 40 minutes per day enhances academic achievement among children:
  - Physical Activity Across the Curriculum (PAAC): a randomised controlled trial to promote physical activity and diminish overweight and obesity in elementary school children (Donnelly et al., 2009);
  - Habitual physical activity and academic performance (Shephard, 1996);
  - Exercise improves executive function and achievement and alters brain activation in overweight children: a randomized controlled trial (Davis et al.,

[100] Ibid
[101] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4160223/

2011);
- The effect of acute treadmill walking on cognitive control and academic achievement in preadolescent children (Hillman et al., 2009); and
- Exercise improves behavioural, neurocognitive, and scholastic performance in children with attention-deficit/hyperactivity disorder (Pontifex et al., 2013).

- Results of the study on the links between physical fitness and academic achievement (Castelli et al., 2007)[102] suggest that schools, particularly at elementary level, should provide appropriate opportunities for children to be physically active and become physically fit: "physical education, among other physical activity opportunities surrounding a school day (i.e., active recess, both before- and afterschool programmes), is positioned to play an important role in addressing public health issues." Schools need to define clearly which curricular components have the greatest impacts.

- In its Worldwide Survey of School Physical Education (2013)[103], the UNESCO highlighted one good practice example from the UK (England), namely 'Olymkids', an annual multi-sport event involving over 500 children from several primary schools who gather to compete in a range of activities. Children are mixed into teams with children from other schools, each team taking the name of an Olympic nation. As the UNESCO reports, "not only does this event provide competition but it also provides an ideal environment for developing inter-personal skills".

- A study by Guevermont, Findlay and Kohen (2014)[104] conducted in Canada examined in-school and out-of-school extracurricular activities among 14 to 17 year olds and associations with socio-emotional and academic outcomes, in addition to having tried smoking, alcohol and marijuana. The researchers found that weekly participation in both out-of-school activities was associated with higher cognitive test scores, but this was only found to be significant in girls. Compared with non-participation, weekly participation in out-of-school activities and in both in-school and out-of-school activities was associated with lower emotional-anxiety, higher pro-social behaviour, and higher self-image. More specifically, weekly participation in out-of-school sports only and in both in-school and out-of-school sports was associated with lower emotional anxiety and higher self-image.

- In its Worldwide Survey of School Physical Education (2013)[105], the UNESCO presented one good practice example in relation to active schools: In Ireland, primary and post-primary schools that managed to develop a physically active and educated school community can be awarded the 'Active Schools Flag'. This

[102] http://www.humankinetics.com/acucustom/sitename/Documents/DocumentItem/7336.pdf
[103] http://unesdoc.unesco.org/images/0022/002293/229335e.pdf
[104] http://web.b.ebscohost.com/ehost/detail/detail?vid=5&sid=b6b5fb77-dadc-48bb-971b-52116eec9a22%40sessionmgr112&hid=110&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=ccm&AN=2012537013
[105] http://unesdoc.unesco.org/images/0022/002293/229335e.pdf

award acknowledges their achievements (such as active commuting and playtimes) and commits them to a process of self-evaluation and continuous improvement of their physical education offer. Teachers must notably plan and implement actions to promote physical activity and enhance physical education and extra-curricular provision. The Active Schools Flag is valid for three years.

2. Valuable interactions between schools and the sport sector

Recommendation 17 – Schools should seek to establish a cooperative framework with sport organisations and other local sport offers in order to promote both curricular and extra-curricular activities.

- In the 'Football for Health' parallel cohort study, Fuller et al. (2010)[106] tested the feasibility of an interactive football-based health education programme for children in grades 6 and 7 in South Africa. Classes of 90 minutes, each divided into two 45 minutes halves of 'Play Football' (coaching of children in specific football skills) and 'Play Fair' (informing children on diseases/health issues and on ways to prevent their occurrence), were delivered to these children. Results showed that the programme was well received by participants, who significantly enhanced their health knowledge:
  - The Grade 6 intervention group showed significant increases in the proportion of correct responses to health knowledge questions post-intervention;
  - The Grade 7 control group showed a significant increase in the proportion of correct responses to health knowledge questions post-'Play Football' and 'Play Fair' sessions;
  - Over 90% of the children provided positive attitude responses to the health-education programme;
  - All coaches provided positive feedback on the training programmes and believed they were well prepared and felt confident about delivering key messages; and
  - Post-intervention increases were maintained at three months post-intervention.

- In 2011, the same experiment was conducted for both in-school groups (Mauritius) and out-of-school groups (Zimbabwe).[107] Results suggested that significant increases in children's knowledge of health issues could be achieved, in both a school-based environment with the support of a national Football Association (Mauritius Football Association, Ministries of Health and Quality of Life, Education and Human Resources, and Youth and Sport) and in an out-of-school environment with the support of an NGO (Grassroot Soccer). The authors concluded that the '11 for Health' programme could be implemented in co-operation with both government and non-government organisations, provided that they can provide the appropriate infrastructure and support:
  - Mean pre- and post-intervention health knowledge scores were greater in Mauritius (pre: 69.3%; post: 87.1%) than Zimbabwe (pre: 57.8%; post: 76.2%), but the mean gain in health knowledge was greater in Zimbabwe (18.4%) than Mauritius (17.8%);

[106] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2938885/
[107] http://www.ncbi.nlm.nih.gov/pubmed/21504962

- The programme was received positively by children in both countries and there were no significant differences in the views of boys and girls in either country;
- Average attendance levels recorded for the children attending each of the sessions were 92.3% (range: 87.0–99.0%) in Mauritius (n=400) and 86.6% (range: 74.3–96.0%) in Zimbabwe (n=422).

- In 2014, the '11 for Health' programme was implemented in five countries in Sub-Saharan Africa – Ghana, Malawi, Namibia, Tanzania and Zambia – with the support of the Education Ministries in each country.[108] Positive results included high attendance of participants (from 88% in Malawi to 99% in Tanzania), increases in children's post-intervention health knowledge levels (from 11% in Malawi to 25% in Namibia), and positive rating of the programme by children in all countries (from 93% in Zambia to 98% in Namibia and Tanzania). According to the authors, the key reasons for success include the "very high satisfaction rating given to the programme by the children involved" and the "benefit of formally collaborating with the Ministries of Education in each country, which created an effective partnership at an early stage and importantly established a commitment to a follow-up nationwide implementation of the programme involving a much larger number of schools."

2.1. Sharing of infrastructures and facilities

Recommendation 18 – Partnerships should be created between schools and sport sector organisations to ensure quality and availability of safe infrastructures and equipment for physical education, extra-curricular or after-school activities, and communities. These partnerships should ensure the efficient management of infrastructures and prevent duplicate or underused facilities.

- The UNESCO Worldwide Survey of School Physical Education (2013) reports concerns about physical education facilities (indoors and outdoors) and associated amenities (such as changing rooms and showers), equipment provision and inadequacies in facility maintenance: "whilst there is a greater propensity of inadequate physical resource provision in low income countries and regions, the divide between these and some schools in middle and high income regions and countries is not always clear-cut. The level of such provision together with challenges presented by inadequate maintenance can detrimentally impact on the nature, scope and quality of physical education programmes".

- As reported in the 2008 EU Physical Activity Guidelines[109], one good practice example of cooperation between schools and sport stakeholders is the government-funded 'Open Doors' programme in Hungary, according to which

[108] http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1048752&site=ehost-live
[109] http://ec.europa.eu/sport/library/policy_documents/eu-physical-activity-guidelines-2008_en.pdf

sport facilities keep their doors open after their official working hours (e.g. evenings and week-ends) to enable communities and families to practise sports. Through the 'Moonlight' programme, the Government also supports clubs that offer free evening or night sport activities to groups of young people living in deprived neighbourhoods.

The same report provides the example of the 'Active Places' database in the UK (England), which stores and makes available on the Internet information on over 50,000 sport and leisure facilities (e.g. sport halls, swimming pools, fitness). The database also contains local authority leisure facilities and commercial and club sites. The Eurydice network on education systems and policies in Europe reports that British local authorities are assessed according to the percentage of the population living within 20 minutes' walking distance (in urban areas) or 20 minutes' driving distance (in rural areas) from high quality sport facilities.

- A recent cost-benefit assessment on the shared use of school facilities with community organisations in the US (Kanters et al., 2014)[110] refers to research arguing for accessible school facilities during and after school hours: "partnerships for sharing public school facilities during non-school hours could create more opportunities for afterschool physical activity, while at the same time reducing overall land requirements and helping fund capital expenditures without substantially increasing operating costs."

  The study reports that local community groups who want to use public school facilities and grounds often have difficulties to access them during out-of-school hours: "Lee et al. reported that only 59.6% of all public schools made their physical activity facilities available for children and adolescents in the evenings, 57.6% were available after school and 46% on weekends. Frequently cited barriers to shared use of school facilities include concerns about security and liability; maintenance, staffing, and supervision costs; limited equipment, space and facilities; and scheduling."

  The cost-benefit showed that "policies that permitted more use of school facilities for community-sponsored programmes increased participation in afterschool programmes without a significant increase in operating expenses." These results suggest that cost-effective partnerships can be developed between schools and community organisations to share facilities and create new afterschool physical activity programmes. The authors also demonstrated that children are more likely to be physically active if there is easy access to parks or other recreational facilities (e.g. proximity; cost of the programme). They estimated that, compared to the 8.4 million US children (K-12th grade) who currently participate in afterschool programmes, "an estimated 18.5 million more would participate if quality programmes were available in their communities." Besides, previous research indicated that 69% of middle school students would play more sports after school if such opportunities were

[110] http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=95447804&site=ehost-live

available.

Findings from the study showed that, although schools host more programmes and have more children using their facilities after school hours, they "did not incur significant additional facility operating costs". These results suggest that shared use of policies enabling an enhanced use of school facilities by community-sponsored programmes increase participation in afterschool physical activity programmes, without significant increases in operating expenses.

- The above-mentioned exploratory case study on university sports partnerships in Portugal (Franco and Pessoa, 2014) showed that sport partnerships with higher education institutions can be developed from the perspective of collaborative entrepreneurship. The authors pointed out that these partnerships combine the interests of different institutions to develop common projects and promote values social intervention, thus facilitating the opening up of universities to society and internal and external stakeholders.

  This collaborative entrepreneurship has helped the university to increase its visibility and attract new students. The university also developed an innovative project with a national company and an international business school, which led to the creation of a manual to teach entrepreneurship to children between three and 12 years. The rationale behind these partnerships is to connect the university to other bodies, thus enhancing indirect social support, visibility and social responsibility. The authors conclude that "sport partnerships are unanimously recognised as important forms of collaborative entrepreneurship to connect the university to other bodies, promote long-term strategic thinking, some of them established between two or more public or private associations/institutions."

- A literature review (Filardo et al., 2010)[111] looking at the joint use of public schools in the US highlighted some of the benefits of this type of strategy:

  > *"Joint use strategies can directly enhance a school's curriculum-related activities. They bring resources and partners to the school, which would otherwise be unavailable. Joint use of schools could be seen as an opportunity to enhance school quality. Under community school strategies, public schools serve as community "hubs," bringing together many partners to offer a range of support services and opportunities to children, youth, families and communities. Schools that house medical, social, and other services have come to be known as "full-service" or "community" schools."*

  The authors also point out the cost-effectiveness of this type of partnership, especially in periods of limited public resources. By using public schools for community health centres, swimming pools, libraries or other services, local

[111] http://eric.ed.gov/?id=ED509513

authorities can reduce overall public land assets and total operating costs. Yet, there are challenges in successfully developing the joint use of public schools:
- Limited funding for utilities, maintenance, repair and security, which increases with higher facility use;
- Lack of staff support to manage space and collaboration requirements;
- Poor design of spaces to accommodate different users;
- Poor risk management support for student safety and building security; and
- Inadequate decision-making processes to allocate access to buildings.

- In the US, Lafleur et al. (2013)[112] assessed whether joint-use agreements – a contract or written agreement between a school and a city or community entity outlining specific terms and conditions of shared use – can increase community member use of open spaces outside of school hours. The study found that community members' use of school sites was 16 times higher in joint use-schools schools that had physical activity programmes than in schools without such programmes. Overall, the study concluded that joint-use agreements are a promising strategy for increasing physical activity among adults and children in under-resourced communities.

- One case study of a Joint Use Agreement (JUA) established in Urban Honolulu, US (Maddock et al., 2008)[113] showed that it provided new opportunities for physical activity to high school's students, teachers, and staff, and to community residents. The authors explain that the "JUA set parameters for use and maintenance of facilities, fee schedule, staffing, use of materials and equipment, liability and risk of loss. The local authorities assumed liability and responsibility for supervising and managing activities. The school assumed responsibility for general cleaning and maintenance of the facilities and did not charge DPR any fees for use of facilities." The key success factors of the programme were:
  - Trust and effective communication among key players;
  - Flexibility of the school administration, which provided office space on campus, communication systems, storage space for equipment and administrative assistance;
  - Constant adaptation of the programmes based on participants' and instructors' feedback;
  - Provision of free recreational classes, eliminating barriers for low-income families;
  - Recruitment of several skilled instructors who could attract and retain participants; and
  - Word-of-mouth publicity to raise awareness, attract and retain participants.

  Since its start, the programme benefitted more 1,000 registered participants. Surveys collected from 320 participants showed that most of them were satisfied with the recreational class they attended and said the programme provided them with a safe place to exercise, motivation to exercise more, and a feeling of

[112] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3675908/pdf/PCD-10-E89.pdf
[113] http://www.cdc.gov/pcd/issues/2008/jul/07_0117.htm

confidence that they could exercise 30 min/day on most days of the week.

Recommendation 19 – School administration should be encouraged to open their sport facilities after schools hours to make them more accessible to local communities and sport organisations.

- A recent cost-benefit assessment on the shared use of school facilities with community organisations in the US (Kanters et al., 2014)[114] refers to research arguing for accessible school facilities during and after school hours: "partnerships for sharing public school facilities during non-school hours could create more opportunities for afterschool physical activity, while at the same time reducing overall land requirements and helping fund capital expenditures without substantially increasing operating costs."

  The study reports that local community groups who want to use public school facilities and grounds often have difficulties to access them during out-of-school hours: "Lee et al. reported that only 59.6% of all public schools made their physical activity facilities available for children and adolescents in the evenings, 57.6% were available after school and 46% on weekends. Frequently cited barriers to shared use of school facilities include concerns about security and liability; maintenance, staffing, and supervision costs; limited equipment, space and facilities; and scheduling."

  The cost-benefit showed that "policies that permitted more use of school facilities for community-sponsored programmes increased participation in afterschool programmes without a significant increase in operating expenses." These results suggest that cost-effective partnerships can be developed between schools and community organisations to share facilities and create new afterschool physical activity programmes. The authors also demonstrated that children are more likely to be physically active if there is easy access to parks or other recreational facilities (e.g. proximity; cost of the programme). They estimated that, compared to the 8.4 million US children (K-12th grade) who currently participate in afterschool programmes, "an estimated 18.5 million more would participate if quality programmes were available in their communities." Besides, previous research indicated that 69% of middle school students would play more sports after school if such opportunities were available.

  Findings from the study showed that, although schools host more programmes and have more children using their facilities after school hours, they "did not incur significant additional facility operating costs". These results suggest that shared use of policies enabling an enhanced use of school facilities by community-sponsored programmes increases participation in afterschool

[114] http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=95447804&site=ehost-live

physical activity programmes, without significant increases in operating expenses.

- Similarly, two randomised controlled trial studies found that afterschool programmes positively impacted children's physical activity (Dzewaltowski et al., 2010; Gutin et al., 2008). Another research study indicated that children are more physically active when there is easy access to facilities and programmes (Cohen et al., 2007). No evidence was found to back-up this recommendation.

- In the US, Lafleur et al. (2013)[115] assessed whether joint-use agreements – a contract or written agreement between a school and a city or community entity outlining specific terms and conditions of shared use – can increase community member use of open spaces outside of school hours. The study found that community member use of school sites was 16 times higher in joint use-schools schools that had physical activity programmes than in schools without such programmes. Overall, the study concluded that joint-use agreements are a promising strategy for increasing physical activity among adults and children in under-resourced communities.

2.2. Label for schools promoting physical activity and sport

Recommendation 20 – A label should be created at European Union level to be awarded to schools respecting a set of criteria demonstrating active involvement in supporting and promoting physical activities and sport.

At the European level, some documents or meetings referred to the idea of introducing an EU label for sport-minded schools.

- The Luxembourg Sports Ministry already proposed, during the 2004 Luxembourg Presidency of the EU, to launch an EU-wide 'sports-minded schools' label that could be awarded to schools respecting key criteria, such as the school management, sports facilities and equipment, compulsory physical education, extra-curricular school activities and institutionalised links with sports clubs.[116]

- In the 2007 White Paper on Sport, the Commission mentioned its "will to introduce the award of a European label to schools actively involved in supporting and promoting physical activities in a school environment […] with a view to raise public awareness of the needs and specificities of the sector, […] make schools more attractive and improve attendance, […] and support health promotion and awareness-raising campaigns through sport".[117]

International and national evidence highlights that such labels already exist in some

[115] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3675908/pdf/PCD-10-E89.pdf
[116] http://www.euractiv.com/sports/sports-minded-schools-idea-makin-news-214108
[117] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52007DC0391

countries.

- In its Worldwide Survey of School Physical Education (2013)[118], the UNESCO presented two examples of good practice in relation to this question:

  - In Ireland, primary and post-primary schools that managed to develop a physically active and educated school community can be awarded the "Active Schools Flag". This award acknowledges their achievements (such as active commuting and playtimes) and commits them to a process of self-evaluation and continuous improvement of their physical education offer. Teachers must notably plan and implement actions to promote physical activity and enhance physical education and extra-curricular provision. The Active Schools Flag is valid for three years; and
  - In Hungary, accredited Sport Elementary Schools provide daily physical education lessons for grades 1- 8. In grades 1- 2, two after-school physical activity sessions are held in order to develop general motor skills and to provide the pupils with the opportunity to participate in fun activities. In grade 3 and thereafter, pupils select a sport and have two/three practice sessions per week.

- For the exploratory case study on university sports partnerships as collaborative entrepreneurship (Franco and Pessoa, 2014)[119], which focused on the Portuguese Institute of Higher Education - University of Beira Interior, researchers focused on the importance of partnerships in sport in institutes of higher education as a form of collaborative entrepreneurship, more precisely on the role of partnerships in the university sport sector as a mechanism of collaborative entrepreneurship.

  Findings suggested that, through this type of partnership, there is a reinforcement of the university's institutional image in society, which attracts new audiences (students, parents, athletes) to the institution and generates income with the arrival of newcomers: "through this collaborative strategy, the university can achieve a greater dimension, share and reduce costs, acquire organisational bonuses and stimulate learning. Partnerships imply that the organisations involved are able to exchange and share resources and competences to create value and develop more resources and capacities to reach a competitive advantage." Furthermore, findings suggested that visibility and public awareness on the 'sport-mindedness' of universities can be achieved through partnerships with the sport sector.

- In the exploratory case study on the German *Verbundsysteme*[120] (coupling of elite sport and school), Borggrefe and Cachay (2012) highlight some of the

[118] http://unesdoc.unesco.org/images/0022/002293/229335e.pdf
[119] http://aas.sagepub.com/content/early/2013/03/21/0095399713481597.abstract
[120] The 'Verbundsystem' is a type of cooperation between schools and organised sports, which aims at providing the best possible athletic and academic support to young athletes (usually in part- or full-time boarding schools)

measures taken to support schools that help and promote talented young athletes. Depending on their specific structural and qualitative features (e.g. number of top-team athletes supervised or links with national training centres), schools can be awarded the special status of *Eliteschule des Sports* ("elite school of sport") by the German Olympic Sports Confederation. Currently, 40 schools in Germany have received this award which recognises that they are "schools with a sports profile", i.e. schools that have chosen the organisational model of sports classes.

These examples suggest that, depending on the fulfilment of specific conditions or the respect of given criteria, schools can be recognised as sport-minded organisations at national level, which validates their efforts, increases their visibility and gives them a special status.

- Another study from Radtke and Coalter from the University of Stirling (2007)[121] suggested some of the key elements that should be considered when developing sustainable sports schools. These include a strong cooperation between all actors (education authorities, teachers and sports federations) and the careful management of the specific culture of sports schools, e.g. ensuring that ordinary pupils accept the relatively privileged position of young athletes.

2.3. Talent development

Recommendation 21 – School administration should create and strengthen the conditions to support and facilitate talent development of young athletes aspiring to a career in elite sports, by promoting the adoption of several specific measures such as flexible curricula and weekly schedules (allowing for sufficient time to train and compete), school enrolment, school transfer, remedial classes, flexible exams dates and tutor teachers.

- In line with the recommendations of the EU Guidelines on Dual careers (European Commission, 2012), one useful tool that could be used to assess the motivation of European student athletes towards a dual-career (academic and athletic) is the SAMSAQ-EU: the European Student-athletes' Motivation towards Sports and Academics Questionnaire, which was tested by Lupo et al. (2015).[122] Results of the study suggest that European student-athletes are highly motivated by both sport and education, and they consider a solid educational background as essential to support their future professional development, e.g. for sport-related careers as sport managers, coaches or physical trainers.

[121] Sports schools and colleges: An international review: https://www.google.be/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CB8QFjAA&url=http%3A%2F%2Fwww.inthewinningzone.com%2Fwz%2FMedia%2FDocs%2FSISFSportsschools%2520-%2520Final%2520Report.doc&ei=F_lVVaXwA8Hq7AbZ1YCQCQ&usg=AFQjCNEkJlTjPXmALGr-WJ9RYIkp0TVNSA&sig2=UhgxmEfrod516L6M577ZFg&bvm=bv.93564037,d.ZGU

[122] Motivation towards dual career of European student-athletes: http://www.ncbi.nlm.nih.gov/pubmed/25145585

Results also suggest that support from national federations increases the motivation of students to pursue a dual career (e.g. in the UK). The ability of sport organisations to negotiate with schools about the admission procedures, examination schedules and tutoring of young athletes is considered crucial in supporting the academic success of elite athletes. Results from the survey also showed that student-athletes living in countries with State-supported dual-career policies – State-centric regulations (e.g. France and Portugal) or State as a sponsor/facilitator (e.g. Sweden) – had the highest motivation towards their future career. On the contrary, student-athletes in countries with a "Laisser Faire" approach (e.g. Italy and Slovenia) had lower athletic commitment and career expectations. As reported by the authors, this suggests that, in these countries, "student-athletes might have a weaker athletic identity, due to envisaged difficulties in career transitions at the end of their sport life".

- One qualitative longitudinal study (Krüger and Keßler, 2014)[123] examining early cultural and sporting careers of young Germans and their educational pathways at secondary schools highlighted the relevance of peer cultures to dual educational careers. The study showed that the peer model could be used as a flexible tool to help young athlete students manage their academic and sport careers in parallel. Indeed, peers have an important support function as guides for a comprehensive academic career. They can provide more emotional-related support than teachers and represent a parallel type of assessment compared to classical academic assessment.

- One international review (Radtke and Coalter, 2007), which collected available evidence on the policies and practices of sports schools, showed that key factors for the success of such schools are the acceptance of the privileged position of student-athletes by other pupils, and the possibilities for all students to integrate and interact, which is considered as necessary for the emotional and social development of young athletes (who might not achieve a career in sport). In parallel, the review highlighted the importance of cooperation between education authorities, teachers and sports federations to establish successful sport schools. The review also suggested a number of necessary conditions to support young sport talents at school, notably:
  - Integrating young athletes within standard secondary schools for their own educational and social benefit;
  - Ensuring the flexibility of curriculum, e.g. enabling young athletes to extend the duration of their studies;
  - Providing various and flexible educational support systems (e.g. pupil partners, summer schools, distance learning);
  - Providing boarding facilities, especially with sports requiring particular facilities;
  - Maintaining close working relationships with sport federations (e.g. selection of pupils, provision of elite coaching, decision on status, assessment of

[123] Early cultural and sporting careers of young people and the role of peer cultures: http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=100108316&site=ehost-live

progress);
- Maintaining close coordination with the elite pupils' local team/sports club and coaches; and
- Ensuring easy access to quality facilities, coaches and services.

- The above-mentioned study on the German *Verbundsysteme* (Borggrefe and Cachay, 2012) reports on three types of measures necessary to support student-athletes, as highlighted by the literature on the topic:
  - *Temporal support*: ensuring a flexible organisation of lessons and exams, e.g. rescheduling tests, coordinating training and lessons during school day (e.g. training in the mornings / lessons in the afternoon), and extending school day;
  - *Social support*: using additional staff to support student-athletes in fulfilling their academic obligations, e.g. remedial tuition to catch up on missed lessons;
  - *Factual support*: adapting contents, e.g. by either reducing lesson contents and exams or introducing competitive sports as "specialised curricular content" in the curriculum.

  The study presented some suggestions of good practices, for instance the fact that, in Special Sports Schools, the prescribed frequency of 32 students per class is reduced to a frequency of 24 students (it can even be below with the approval of the state educational authority), with a view to achieving optimum student-teacher ratios. Key actors from elite sport – such as representatives of sports associations and coaches – can also be involved in developing Special Sports Schools, designing parts of the curriculum and selecting talented young athletes for the schools.

  The authors of the case study concluded by highlighting the importance of "anchoring elite sport training in the school system, which appears highly attractive since it ensures that sport has reliable access to important resources, above all staff, sports facilities, and time." They also pointed out the necessary conditions to make this happen at school level: a flexible educational landscape that enables schools to make autonomous decisions about their pedagogical orientation; being awarded a special status enhances recognition, increases visibility and provides access to key resources (staff, facilities and time); adequate student-teacher ratios for training in physical education classes. According to the authors, in schools with no tradition of supporting elite sports, or where the promotion of school-aged athletes is considered as incompatible with the standard role of education, "the structural coupling of elite sport and school seems scarcely possible."

2.4. Contribution of certified sport coaches

Recommendation 22 – Frameworks should be developed at the national level to promote participation of certified coaches in cooperation between schools, sport

organisations, and local authorities with the objective of creating a sustainable impact on schools and complementing the sport skills of teachers. This participation should not replace compulsory physical education classes or compensate for a possible lack of physical education teachers.

- The 2013 Eurydice report on 'Physical Education and Sport at School in Europe'[124] mentions the diverse situations of Member States regarding the involvement of sport coaches in physical education classes. For instance, in Germany, France and Ireland generalists who teach physical education at primary level may be assisted by a sports coach or advisor employed by the school. In Ireland, generalists coaching qualifications or special interest in a particular sport are sometimes deployed to teach physical education (approx. one-third of teachers at this level). In Malta, outside coaches can hold PE sessions with primary pupils.

  The report also highlights one example of a large-scale initiative in the UK (Wales), which involves coaches in teaching PE at school: the 'Dragon Multi-Skills and Sport' programme[125] introduces children aged 7-11 to coaching, skills development and appropriate competition using modified versions of adult games to reflect their needs and skill levels. Learning resources for the programme include volunteer parents, teachers and external coaches, who are used to develop opportunities outside the school curriculum and in the community. Teachers can liaise with coaches to use them as resources in physical education lessons.

- As highlighted in the study 'Self-esteem in children and youth: The role of sport and physical education' (Whitehead, 1997)[126], evidence suggests that, when used inappropriately, physical education programmes can have negative effects on children's self-esteem and motivation. Therefore, guidelines for physical education teachers and coaches are sometimes necessary to ensure that physical activity leads to the intended positive effects.

- One exploratory case study on the coupling of elite sport and school (Borggrefe and Cachay, 2012)[127] examined the German 'Verbundsysteme', a form of cooperation between schools and organised sports which was established to promote talented school-aged athletes and enhance student success chances in dual careers. One of the key elements of the 'Verbundsystem', as highlighted in this case study, is the involvement of key actors from elite sport in designing and developing the curriculum in these Special Sports Schools. Steering committees, composed of teacher-coaches from the school, representatives of

[124] http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/150EN.pdf
[125] http://sport.wales/community-sport/education/dragon-multi-skills--sport.aspx
[126] http://web.a.ebscohost.com/ehost/detail/detail?sid=282b3aaf-abe4-4c10-80fd-f837ec0ad900%40sessionmgr4001&vid=0&hid=4207&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=psyh&AN=1997-08965-007
[127] http://www.ejss.ch/PDF-Dateien/ejss2012_Vol9_Issue1+2_Borggrefe-Cachay_Dual%20Careers-The%20Structural%20Coupling%20of%20Elite%20Sport%20and%20School-Exemplified%20by%20the%20German%20Verbundsysteme.pdf

sports associations, and coaching experts, have been set up to further develop the curricula of these schools, and to recruit talented young athletes.

The authors of the case study conclude by highlighting the importance of "anchoring elite sport training in the school system, which appears highly attractive since it ensures that sport has reliable access to important resources, above all staff, sports facilities, and time." The special status granted to these schools, the possibility to employ teacher-coaches, and the ability of schools to take autonomous decisions about their pedagogical orientation, are all crucial success factors.

3. Valuable interactions between schools and local authorities

3.1. Active transport

Recommendation 23 – Local authorities should promote the necessary conditions to develop active transport to and from school, especially reducing car traffic and speed near schools, developing safe routes for cycling or walking groups ("pedibus") or active skating, providing bicycle racks and promoting active transport among all members of school communities.

- In New Zealand, Macmillan et al. (2014)[128] compared the effects of policies to increase bicycle commuting in a car-dominated city and explored the complexities of transport planning through participatory modelling. Findings from the modelling suggest that transforming urban roads using best practice physical separation on main roads and bicycle-friendly speed reduction on local streets, would yield societal benefits of 10 to 25 times greater than the costs.

- A study by Buliung et al. (2011)[129] examined the results of a school travel planning pilot that was implemented in 12 schools in four Canadian provinces. Drawing on the pilot study, the researchers sought to determine the effectiveness of the school travel planning as an approach to promote and facilitate the adoption of active and healthier choices for school travel. Researchers found that school travel plans had a positive impact on people's active transport to school: rates of active transportation increased from 43.8% to 45.9%. At follow-up, 13.3% of households reported less driving. Moreover, capital improvement projects were found to be more common in older suburban neighbourhoods, whilst enforcement projects were more common at schools in newer suburban areas.

- Yang and Diez-Roux (2013)[130] used an agent-based model to explore how various policies may influence children's active travel to school. The study recommends that, in order to maximise the percentage of children who walk to school, school locations should be evenly distributed throughout communities and children should be assigned to the closest school. Additionally, the study recommends that interventions to improve traffic safety, targeting a smaller area around the school with greater intensity, may be more effective than

[128] http://web.b.ebscohost.com/ehost/detail/detail?vid=8&sid=b6b5fb77-dadc-48bb-971b-52116eec9a22%40sessionmgr112&hid=110&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=ccm&AN=2012537443
[129] http://web.b.ebscohost.com/ehost/detail/detail?vid=11&sid=b6b5fb77-dadc-48bb-971b-52116eec9a22%40sessionmgr112&hid=110&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=ccm&AN=2011299700
[130] http://web.b.ebscohost.com/ehost/detail/detail?vid=13&sid=b6b5fb77-dadc-48bb-971b-52116eec9a22%40sessionmgr112&hid=110&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=mnh&AN=23705953

targeting a larger area with less intensity.

- Chriqui et al. (2012)[131] looked at nationally representative samples of US public elementary schools from 2007 to 2009, and analysed the relationship between State laws requiring minimum bussing distances, hazardous route exemptions, sidewalks, crossing guards, speed zones, and traffic control measures around schools and active travel to school practices and policies. The researchers found that State laws that require crossing guards around schools appear to be effective in reducing barriers to walking and cycling to school, increasing the odds of allowing all students to cycle to school, and reducing the odds of zero students walking to school.

  They also found that State laws requiring speed zones around schools lowered the odds of zero students walking or cycling to school by 51%, although these laws did not reduce the reported traffic-related barriers, nor did such laws significantly increase the odds of allowing all students to walk cycle to school or the proportion of students walking or cycling to school.

- In New Zealand, Hinckson and Badland (2011)[132] conducted an analysis of the 'School Travel Plan' programme, which was developed through a collaboration between the school, communities and the local council to increase school-related active travel rates and decrease traffic congestion. The programme was adapted to the specific needs of each school and included educational initiatives and physical infrastructural changes around the schools. Researchers looked at the effectiveness of the programme in modifying school travel modes among children and found that there was an increase in active transport between 5.9% and 6.8% compared to baseline travel modes.

- A study conducted in Belgium (Ducheyne et al., 2012)[133] looked at individual, social and physical environmental correlates of 'never' and 'always' cycling to and from school, among 10 to 12 years olds living within a three-km radius of the school. The study aimed at identifying the main reasons why some children engage in regular cycling to school whilst other children did not. The results showed that environmental factors significantly influenced whether pupils cycled to school or not; only in neighbourhoods where parents perceived traffic safety to be high was there a significant association with cycling to school.

[131] http://ac.els-cdn.com/S1353829211001341/1-s2.0-S1353829211001341-main.pdf?_tid=4cfc6dac-0aa1-11e5-9d30-00000aab0f26&acdnat=1433412540_f556c64320813399f4297a3b6e4df460
[132] http://www.ncbi.nlm.nih.gov/pubmed/21721961
[133] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3541214/pdf/1479-5868-9-142.pdf

3.2. Sport infrastructures

Recommendation 24 – Local authorities should develop efficient models to plan, manage and fund high quality and safe physical activity and sport infrastructures making them accessible for schools, sport organisations, local communities and citizens.

- The UNESCO Worldwide Survey of School Physical Education (2013) reports concerns about physical education facilities (indoors and outdoors) and associated amenities (such as changing rooms and showers), equipment provision and inadequacies in facility maintenance: "whilst there is a greater propensity of inadequate physical resource provision in low income countries and regions, the divide between these and some schools in middle and high income regions and countries is not always clear-cut. The level of such provision together with challenges presented by inadequate maintenance can detrimentally impact on the nature, scope and quality of physical education programmes".

- As reported in the 2008 EU Physical Activity Guidelines[134], one good practice example of cooperation between schools and sport stakeholders is the government-funded 'Open Doors' programme in Hungary, according to which sport facilities keep their doors open after their official working hours (e.g. evenings and week-ends) to enable communities and families to practise sports. Through the 'Moonlight' programme, the Government also supports clubs that offer free evening or night sport activities to groups of young people living deprived neighbourhoods.

  The same report provides the example of the 'Active Places' database in the UK (England), which stores and makes available on the Internet information on over 50,000 sport and leisure facilities (e.g. sport halls, swimming pools, fitness). The database also contains local authority leisure facilities and commercial and club sites. Eurydice reports that British local authorities are assessed according to the percentage of the population living within 20 minutes' walking distance (in urban areas) or 20 minutes' driving distance (in rural areas) from high quality sport facilities.

- A recent cost-benefit assessment on the shared use of school facilities with community organisations in the US (Kanters et al., 2014)[135] refers to research arguing for accessible school facilities during and after school hours: "partnerships for sharing public school facilities during non-school hours could create more opportunities for afterschool physical activity, while at the same time reducing overall land requirements and helping fund capital expenditures without substantially increasing operating costs."

[134] http://ec.europa.eu/sport/library/policy_documents/eu-physical-activity-guidelines-2008_en.pdf
[135] http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=95447804&site=ehost-live

The study reports that local community groups who want to use public school facilities and grounds often have difficulties to access them during out-of-school hours: "Lee et al. reported that only 59.6% of all public schools made their physical activity facilities available for children and adolescents in the evenings, 57.6% were available after school and 46% on weekends. Frequently cited barriers to shared use of school facilities include concerns about security and liability; maintenance, staffing, and supervision costs; limited equipment, space and facilities; and scheduling."

The cost-benefit showed that "policies that permitted more use of school facilities for community-sponsored programmes increased participation in afterschool programmes without a significant increase in operating expenses." These results suggest that cost-effective partnerships can be developed between schools and community organisations to share facilities and create new afterschool physical activity programmes. The authors also demonstrated that children are more likely to be physically active if there is easy access to parks or other recreational facilities (e.g. proximity; cost of the programme). They estimated that, compared to the 8.4 million US children (K-12th grade) who currently participate in afterschool programmes, "an estimated 18.5 million more would participate if quality programmes were available in their communities." Besides, previous research indicated that 69% of middle school students would play more sports after school if such opportunities were available.

Findings from the study showed that, although schools host more programmes and have more children using their facilities after school hours, they "did not incur significant additional facility operating costs". These results suggest that shared use of policies enabling an enhanced use of school facilities by community-sponsored programmes increase participation in afterschool physical activity programmes, without significant increases in operating expenses.

- A literature review (Filardo et al., 2010)[136] looking at the joint use of public schools in the US highlighted some of the benefits of this type of strategy:

> *"Joint use strategies can directly enhance a school's curriculum-related activities. They bring resources and partners to the school, which would otherwise be unavailable. Joint use of schools could be seen as an opportunity to enhance school quality. Under community school strategies, public schools serve as community "hubs," bringing together many partners to offer a range of support services and opportunities to children, youth, families and communities. Schools that house medical, social, and other services have come to be known as "full-service" or "community" schools."*

The authors also point out the cost-effectiveness of this type of partnership,

[136] http://eric.ed.gov/?id=ED509513

especially in periods of limited public resources. By using public schools for community health centres, swimming pools, libraries or other services, local authorities can reduce overall public land assets and total operating costs. Yet, there are challenges to successfully develop the joint use of public schools such as:

- Limited funding for utilities, maintenance, repair and security, which increases with higher facility use;
- Lack of staff support to manage space and collaboration requirements;
- Poor design of spaces to accommodate different users;
- Poor risk management support for student safety and building security; and
- Inadequate decision-making processes to allocate access to buildings.

- In the US, Lafleur et al. (2013)[137] assessed whether joint-use agreements – a contract or written agreement between a school and a city or community entity outlining specific terms and conditions of shared use – can increase community member use of open spaces outside of school hours. The study found that community member use of school sites was 16 times higher in joint use-schools schools that had physical activity programmes than in schools without such programmes. Overall, the study concluded that joint-use agreements are a promising strategy for increasing physical activity among adults and children in under-resourced communities.

- One case study of a Joint Use Agreement (JUA) established in Urban Honolulu, US (Maddock et al., 2008)[138] showed that it provided new opportunities for physical activity to high school's students, teachers, and staff, and to community residents. The authors explain that the "JUA set parameters for use and maintenance of facilities, fee schedule, staffing, use of materials and equipment, liability and risk of loss. The local authorities assumed liability and responsibility for supervising and managing activities. The school assumed responsibility for general cleaning and maintenance of the facilities and did not charge DPR any fees for use of facilities." The key success factors of the programme are the following:
  - Trust and effective communication among key players;
  - Flexibility of the school administration, which provided office space on campus, communication systems, storage space for equipment and administrative assistance;
  - Constant adaptation of the programmes based on participants' and instructors' feedback;
  - Provision of free recreational classes, eliminating barriers for low-income families;
  - Recruitment of several skilled instructors who could attract and retain participants; and
  - Word-of-mouth publicity to raise awareness, attract and retain participants.

[137] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3675908/pdf/PCD-10-E89.pdf
[138] http://www.cdc.gov/pcd/issues/2008/jul/07_0117.htm

Since its start, the programme benefitted more 1,000 registered participants. Surveys collected from 320 participants showed that most of them were satisfied with the recreational class they attended and said the programme provided them with a safe place to exercise, motivation to exercise more, and a feeling of confidence that they could exercise 30 min/day on most days of the week.

3.3. Awareness campaigns

Recommendation 25 – In cooperation with schools, sport organisations and other stakeholders, local authorities should develop and implement local campaigns to promote regular physical activity and sport as part of a healthier lifestyle.

- In the US, Lafleur et al. (2013)[139] assessed whether joint-use agreements – a contract or written agreement between a school and a city or community entity outlining specific terms and conditions of shared use – can increase community member use of open spaces outside of school hours. The study found that community member use of school sites was 16 times higher in joint use-schools that had physical activity programmes than in schools without such programmes. Overall, the study concluded that joint-use agreements are a promising strategy for increasing physical activity among adults and children in under-resourced communities.

- In 2006, the Memphis Grizzlies (an American basketball team) launched 'Get Fit with the Grizzlies', a six-week programme focusing on nutrition and physical activity for the 4th and 5th grades' students of Memphis City Schools. Both local and national were solicited to fund the programme. The multinational Kellogg's also joined the programme as the primary sponsor. During the 2010-11 school-year, the programme was turned into 'Healthy Home Court', which added a breakfast component to the original fitness part of the programme, in the form of 'carts' with healthy breakfast options (e.g. fruits, protein bars) for pupils.

  Researchers Irwin et al. (2012)[140] conducted survey research over four years to measure the health knowledge acquisition and behaviour change in the Memphis area. The researchers found significant improvements in health knowledge and health behaviour after the intervention. In addition, students who attended the breakfast assembly gained knowledge about healthier eating and positively changed their attitude towards the academic and health benefits of health eating.

- Amour and Sandford (2013)[141] conducted a four-year evaluation of a corporate-

[139] http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3675908/pdf/PCD-10-E89.pdf
[140] http://www.ncbi.nlm.nih.gov/pubmed/22910518
[141] http://web.b.ebscohost.com/ehost/detail/detail?vid=15&sid=b6b5fb77-dadc-48bb-971b-52116eec9a22%40sessionmgr112&hid=110&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=pbh&AN=84945327

sponsored intervention (HSBC) aiming to promote positive development for disaffected youth through physical activity, sport and education in light of the 2012 London Olympics. The evaluation found that HSBC demonstrated successful involvement in supporting physical activity programmes to benefit local communities. In turn, the programme and physical activities included in the programme indicated some positive impact on the behaviour and social development of participants. In addition, it demonstrated sustainable outcomes, for example, over 50% of pupils maintained this progress to the point of leaving school at 16 years (i.e. 36 months after initial project involvement).

- A study by Ming Wen et al. (2002)[142] evaluated a community-based multi-strategic health promotion intervention, 'Concord, A Great Place to be Active', which was implemented from 1997 to 1999. It aimed at increasing the physical activity levels of women aged 20–50 years living in the Concord Local Government Area (LGA), an inner-western region of Sydney, Australia. A key feature of this intervention was a partnership between Concord Council (the local government) and the Central Sydney Health Promotion Unit (CSHPU). Following the intervention, there was a statistically significant (6.4%) reduction in the proportion of sedentary women. Further, there were a number of positive enhancements in the Council's capacity to promote physical activity in the community. These findings suggest that a community-based intervention targeting a specific population can achieve positive changes in physical activity and that a local government has the capacity to be involved in and sustain physical activity interventions.

- An evaluation of the Indigenous Youth Sports Program (IYSP) in Australia (Macgregor et al., 2015)[143] – which uses sports as a means of engaging Indigenous school students into higher education and enhancing their awareness about university – showed that participation in higher education may be increased by using sports as a medium for career guidance and post-school study pathways, since sport is used as a way to facilitate interactions between schools and Indigenous students. The evaluation demonstrated that the IYSP managed to increase Indigenous secondary school students' knowledge of higher education opportunities and provided them with key information on their career and study options, while, before the programme most of them had no clear perception of post-study career options in five years' time.

  The authors reported that "the absolute number of participants talking to friends about potential career options almost doubled following the IYSP (58 to 94), suggesting that it may have a wider reach to individuals in the region beyond those who attended the programme." Besides, changes in the responses to two statements – 'My education is my ticket to the job or career I want in the future' and 'University is something I can consider anytime in the future' – in the pre- and post-programme survey suggests that the programme succeeded in

[142] http://heapro.oxfordjournals.org/content/17/2/127.full
[143] http://search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=102345174&site=ehost-live

increasing the participation of Indigenous students in higher education in Australia through the use of sport.

- For the exploratory case study on university sports partnerships as collaborative entrepreneurship (Franco and Pessoa, 2014)[144], which focused on the Portuguese Institute of Higher Education - University of Beira Interior, researchers focused on the importance of partnerships in sport in institutes of higher education as a form of collaborative entrepreneurship, more precisely on the role of partnerships in the university sport sector as a mechanism of collaborative entrepreneurship.

  Findings suggested that, through this type of partnership, there is a reinforcement of the university's institutional image in society, which attracts new audiences (students, parents, athletes) to the institution and generates income with the arrival of newcomers: "through this collaborative strategy, the university can achieve a greater dimension, share and reduce costs, acquire organisational bonuses and stimulate learning. Partnerships imply that the organisations involved are able to exchange and share resources and competences to create value and develop more resources and capacities to reach a competitive advantage." These findings suggest that visibility and public awareness on the 'sport-mindedness' of universities can be achieved through partnerships with the sport sector.

[144] http://aas.sagepub.com/content/early/2013/03/21/0095399713481597.abstract

4. Valuable interactions between schools and the private sector

Recommendation 26 – Private sector organisations should be encouraged to cooperate with schools or other educational institutions to develop a physical activity and sport offer for young people such as sport camps, regular sport programmes, extracurricular activities, and public awareness-raising events, in particular in areas where opportunities are limited, and to make it accessible for pupils and school community. These activities must be framed by pedagogical principles, respect equity and ethical values but they should not replace compulsory physical education classes.

- In 2006, the Memphis Grizzlies (an American basketball team) launched 'Get Fit with the Grizzlies', a six-week programme focusing on nutrition and physical activity for the 4th and 5th grades' students of Memphis City Schools. Both local and national educational authorities were solicited to fund the programme. The multinational Kellogg's also joined the programme as the primary sponsor. During the 2010-11 school-year, the programme was turned into 'Healthy Home Court', which added a breakfast component to the original fitness part of the programme, in the form of 'carts' with healthy breakfast options (e.g. fruits, protein bars) for pupils.

  Researchers Irwin et al. (2012)[145] conducted survey research over four years to measure the health knowledge acquisition and behaviour change in the Memphis area. The researchers found significant improvements in health knowledge and health behaviour after the intervention. In addition, students who attended the breakfast assembly gained knowledge about healthier eating and positively changed their attitude towards the academic and health benefits of healthy eating.

- Amour and Sandford (2013)[146] conducted a four-year evaluation of a corporate-sponsored intervention (HSBC) aiming to promote positive development for disaffected youth through physical activity, sport and education in light of the 2012 London Olympics. The evaluation found that HSBC demonstrated successful involvement in supporting physical activity programmes to benefit local communities. In turn, the programme and physical activities included in the programme indicated some positive impact on the behaviour and social development of participants. In addition, it demonstrated sustainable outcomes, for example, over 50% of pupils maintained this progress to the point of leaving school at 16 years (i.e. 36 months after initial project involvement).

[145] http://www.ncbi.nlm.nih.gov/pubmed/22910518
[146] http://web.b.ebscohost.com/ehost/detail/detail?vid=15&sid=b6b5fb77-dadc-48bb-971b-52116eec9a22%40sessionmgr112&hid=110&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=pbh&AN=84945327

5. Monitoring

Recommendation 27 – Effort should be encouraged to improve data collection on HEPA with objective measurements at the school level.

No evidence was found to back up this recommendation.

Recommendation 28 – The European Commission should report on the progress regarding the implementation of these recommendations.

No evidence was found to back up this recommendation.

6. Dissemination

No recommendation.