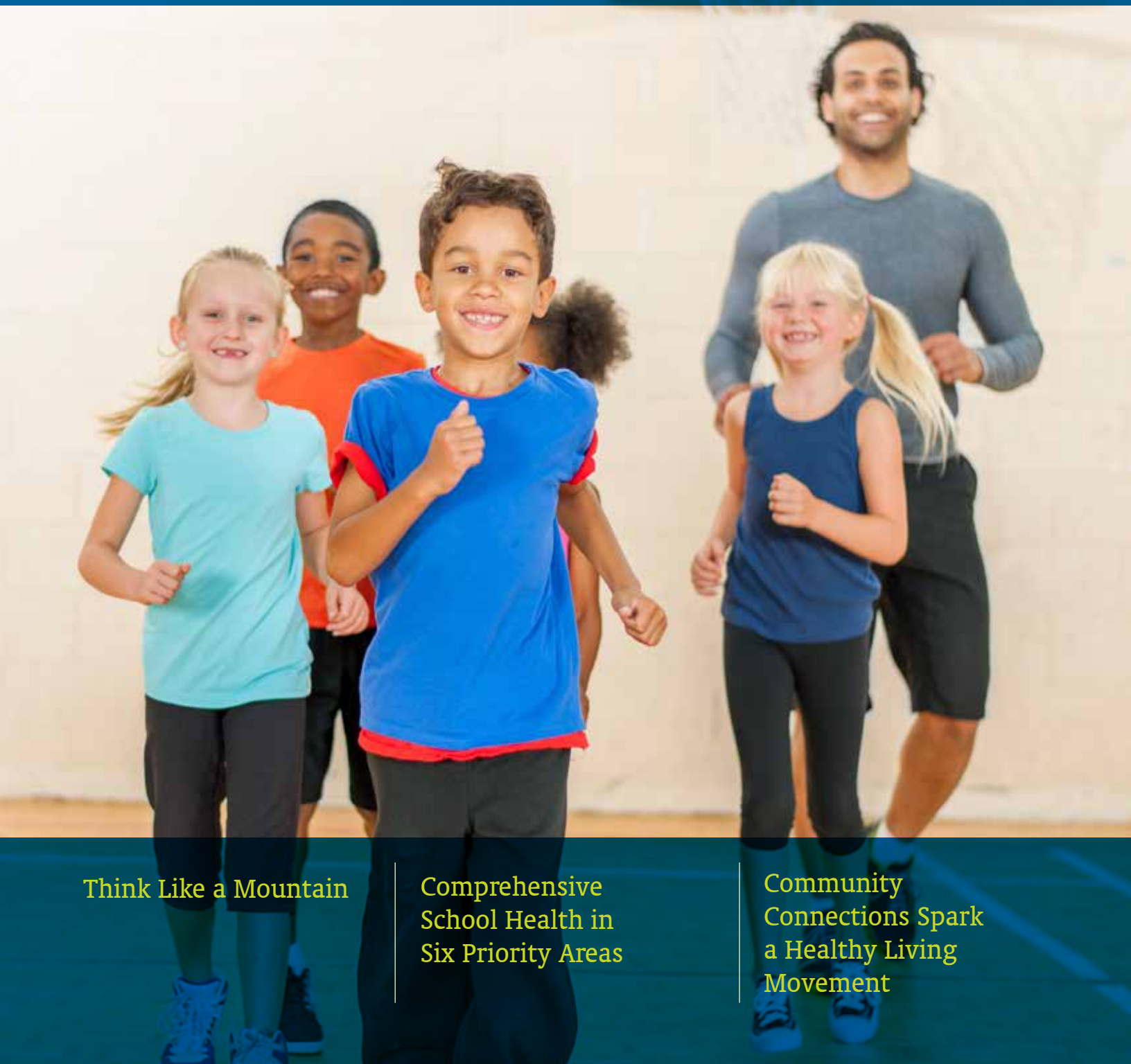
Volume 47, Number 2, 2016

Runner:

HPEC Health & Physical Education Council
The Alberta Teachers' Association

The Journal of the Health and Physical Education Council of The Alberta Teachers' Association



Think Like a Mountain

Comprehensive School Health in Six Priority Areas

Community Connections Spark a Healthy Living Movement

HPEC Mission Statement

The Health and Physical Education Council (HPEC), as a professional organization of teachers, advocates for quality health and physical education programs and provides opportunities for professional growth and development of its members. HPEC is committed to providing leadership in creating healthy active school communities.

HPEC Vision Statement

Alberta teachers will provide quality instruction and programs in health and physical education to promote the development of healthy active lifestyles in students.

The objectives of HPEC shall be to

- improve curriculum, instruction and assessment in health and physical education through increased knowledge, skills and understanding;
- develop, study and propose professional resources and responses to health and physical education issues;
- ensure teachers have access to meaningful professional development opportunities that meet their needs throughout all stages of their career;
- enhance the expertise of members by promoting an understanding of current research to inform professional practice;
- liaise with other organizations that seek to promote healthy active lifestyles within school communities;
- further the continuous development and evaluation of standards and guidelines within the profession for personnel, programs and facilities in health and physical education; and
- facilitate broad-based, skilful participation in the planning and implementation of effective, collaborative, ongoing professional development.

HPEC believes that

- a well-delivered health and physical education curriculum supported by quality instruction can change health behaviours of children and youth in K–12;
- health and physical education play a valued and vital role in providing a quality, balanced education for all children and youth in Alberta schools;
- all students in all grades in Alberta schools should have the right and opportunity to experience sustained, vigorous physical activity through participation in quality daily physical education programs;
- wellness is an outcome of quality health and physical education programs that develop the knowledge, skills and attitudes to assist students to make appropriate choices to live active, healthy lives; and
- comprehensive school health is the framework for the delivery of quality health and physical education programs to promote and develop wellness in Alberta's children and youth.

Runner: The Journal of the Health and Physical Education Council of The Alberta Teachers' Association is a professional journal for physical education teachers in Alberta. Authors are encouraged to submit articles of relevance in either a peer review or editorial review process. Topics may include, but are not limited to, personal explorations of significant classroom experiences; descriptions of innovative classroom and school practices; reviews or evaluations of instructional and curricular methods, programs or materials; discussions of trends, issues or policies; and scientific research.

Manuscripts on other themes will also be considered for publication and may be up to 2,500 words long. References to works cited should appear in full in a list at the end of the article using *The Chicago Manual of Style's* author-date system. Photographs, line drawings and diagrams are welcome. To ensure quality reproduction, digital photographs should have a minimum of 300dpi. A caption and photo credit should accompany each photograph. The contributor is responsible for obtaining consent to use a photo image and written parental permission for any image or works by children under 18 years of age.

Manuscripts should be submitted electronically in Word format. A cover page should include the contributor's name, professional position, address, and phone numbers and e-mail address. A Copyright Transfer Agreement must be completed once a submission is accepted.

Contributions are reviewed by the editor, who reserves the right to edit for clarity and space. Send manuscripts for future issues to Dwayne Sheehan at dpsheehan@mtroyal.ca.

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Runner: *The Journal of the Health and Physical Education Council of The Alberta Teachers' Association*

Volume 47, Number 2, 2016

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Graduate Student Articles

Uetus et Nouum

Editorial Board

Editor's Message

A Universal Understanding of Physical Literacy Benefits Children and Youth

Dwayne Sheehan

A noteworthy amount of attention has been given to the concept of physical literacy (PL) in Canada. The term is being associated with a shift toward teaching a broad range of fundamental movement skills (FMS) as part of Canada's long-term athlete development plan. All Canadian sport organizations that receive federal government funding now require that PL and FMS development be embedded in the sequence of training that a child passes through in every sport (baseball, ringette, biathlon, swimming and so on). Because the sport sector was initially the driving force for PL in Canada, the emphasis on FMS has overshadowed the more holistic intention of the PL movement.

The education sector has been playing catch-up and done an admirable job of trying to position PL in a broader context. Many hard-working teachers and professors have spent countless hours trying to advocate for the virtues of physical literacy beyond the psychomotor domain. The holistic meaning of PL is perfectly aligned with the outcomes of every physical education (PE) and health curriculum in the country. Recognizing that children's physical growth and maturation is directly connected to their cognitive, social and emotional development honours the intent of the PL term, originally coined by Margaret Whitehead. The first line in the Alberta PE program of studies is the essence of PL:

> The aim of the Kindergarten to Grade 12 physical education program is to enable individuals to develop the knowledge, skills and attitudes necessary to lead an active, healthy lifestyle.

It's also worth noting that all five of the PE national standards in the United States[1] have PL embedded in them:

- Standard 1—The physically literate individual demonstrates competency in a variety of motor skills and movement patterns.
- Standard 2—The physically literate individual applies knowledge of concepts, principles, strategies and tactics related to movement and performance.
- Standard 3—The physically literate individual demonstrates the knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness.
- Standard 4—The physically literate individual exhibits responsible personal and social behavior that respects self and others.
- Standard 5—The physically literate individual recognizes the value of physical activity for health, enjoyment, challenge, self-expression and/or social interaction.

[1] American Alliance for Health, Physical Education, Recreation and Dance. 2013. *Grade-Level Outcomes for K-12*. Reston, Va: Author.

Until last spring (2015), there was no universally accepted definition of PL that could be used consistently across all sectors. In addition to the sport and education definitions, Canadian researchers had their own interpretation of what PL was, and so did the recreation sector. As expected, this lack of agreement resulted in confusion between sectors, within sectors and, most important, with parents and policy makers. In May 2014, the International Physical Literacy Association (IPLA) proposed a single, multipurpose definition that was eventually adopted at a global gathering of PL experts in Vancouver. The Canadian agreement was a result of a collaborative effort led by ParticipACTION and included input from every sector across the country. The universally accepted definition of PL is as follows:

> Physical literacy is the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life.

The purpose of this consensus statement is to

- promote the value of PL and preserve the integrity of the concept,
- facilitate alignment between multiple sectors in the PL community,
- improve the consistency and clarity of communications relating to PL and
- encourage a coordinated development of PL tools and resources.

The holistic nature of PL has introduced a new way of thinking about the professional training of physical education leaders. The concept of PL may not be the silver bullet, but there is significant merit in the premise of emphasizing intrinsic motivation, FMS, confidence and positive self-esteem in all children. PL has become an international phenomenon and a concept that has encouraged many PE professionals to reflect upon their current practice.

President's Message

Staying Connected in #Physical Education

Sonia Sheehan

We live in an age in which being connected to our profession and like-minded teachers in our profession is easier than ever. With the advancement of technology and the common place of social media, it is a relatively simple process to get information on health and physical education, connect with an expert PE teacher or share a great teaching idea we have with the world. HPEC is one way to stay connected. Join the HPEC Facebook page and be a follower of the HPEC Twitter account @albertaHPEC. Our HPEC webpage, www.hpec.ab.ca, has been newly designed to be mobile friendly and is a wealth of information regarding professional development opportunities in the province as well as online grant applications and award nomination forms.

However, in today's educational setting we are not limited to just our own province of Alberta. Teachers can connect with health and physical educators across Canada, North America and even around the world. I encourage you to explore the vast array of physical education professionals and organizations you can connect with via Twitter.

Through my own social media connections and pursuits, I have expanded my knowledge of teaching physical education. I encourage you to connect with me—@sonia_sheehan on Twitter. I am sharing my best teaching practices via Twitter, and this year alone I have already accumulated great games, wellness initiatives and apps for phys ed via my Twitter connections. I feel connected to the #Physical Education community, and I know it is benefiting my professional practice as a physical education teacher in the province of Alberta.

Let's stay connected—here are some #s to get you into the conversation: #PhysicalEducation, #physed, #pe, #PhysicalLiteracy, #EASChat, #ComprehensiveSchoolHealth.

Ever Active Schools

2014/15 Year in Review

Brian Torrance

Vision

All Alberta students belong to healthy school communities that enable optimal health and learning.

Mission

To provide provincial leadership that promotes and supports healthy, active school communities through a comprehensive school health approach.

Priority

Lead, support and connect work toward improved health and learning outcomes of children in Alberta.

In 2014/15, Ever Active Schools continued to assist schools in creating and sustaining healthy active school communities.

By fostering a comprehensive school health approach, Ever Active Schools contributed to provincial efforts to support the healthy development of children and youth in Alberta.

Working through our five core strategies, Ever Active Schools saw growth in nearly every area, resulting in expanded support to 47 per cent of Alberta school communities and communications and resources to all 61 school jurisdictions.

Ever Active Schools remained a reliable and responsive delivery arm for school wellness in Alberta amid a changing political landscape. This meant providing school communities with the knowledge, resources and skills needed for interdisciplinary, competency-focused solutions for healthy schools. Ever Active Schools was successful in coordinating action from many partners and from diverse sectors within this context, while honouring the priorities of each sector. The results of this work showed improvements in students' knowledge of and behaviours toward health and wellness.

2014/15 Key Activities and Results

Intended Outcomes

- Increase the coordination and reach of school health-related activities in Alberta
- Increase preparedness of school communities to bring *Inspiring Education* to life
- Facilitate increased communication and collaboration among school communities
- Demonstrate improved health behaviours in target populations
- Increase the self-efficacy of school community leaders to address comprehensive school health priorities

Results

- Engaged 920 school communities as member schools.

- Reached 3,216 participants through professional learning opportunities.
- Communicated with all 61 school jurisdictions in the province.
- Collaborated with 70 municipal, provincial and national partners to support school wellness.
- Participated in partner meetings with Government of Alberta, Alberta Health Services and Alberta Healthy School Community Wellness Fund to create a provincial three-year Healthy Schools Action Plan.
- Developed and distributed 22 different resources that support wellness and cross-curricular competencies.
- Two-thirds of participants attested to forming new partnerships as a result of attending the annual conference, Shaping the Future.
- Five months after Shaping the Future, 80 per cent of delegates used knowledge gained at the conference in their current roles.
- Prototyped an online hub for school communities to connect and access support for comprehensive school health. The tool was pilot tested with 27 school teams.
- Shared local success stories provincially via the *Healthy Schools Alberta* magazine, distributed to all schools in Alberta.
- Three months after attending Healthy Active School Symposium, 64 per cent of schools made changes to the physical activity participation in their school.
- Three months after attending Healthy Active School Symposium, 44 per cent of schools made changes to the healthy eating practices at their school.
- Three months after attending Healthy Active School Symposium, 62 per cent of schools made changes that affected the positive social environment of their school.
- Provided 145 learning opportunities to school stakeholders.
- Sixty-four per cent of participants changed their teaching practice to better address health and wellness in their school community after attending an Ever Active Schools professional learning opportunity.

Common Interest Articles

Change Through Collaborative Action

Nancy Melnychuk

R Tait McKenzie Scholar Address and Robert Routledge Memorial Address

PHE Canada—HPEC National Conference, Banff, May 2, 2015

Thank you for the privilege of speaking with you this evening in recognition and honour of two great Canadian leaders, Dr R Tait McKenzie and Mr Robert Routledge, whose wisdom and inspiration over several generations continue to ignite the field of physical and health education, dance, sport and recreation.

The award recipients being honoured tonight are outstanding examples of individuals who exemplify not only the goals of PHE Canada but also the beliefs, values and actions of Dr McKenzie and Mr. Routledge. Like these two outstanding mentors before them, the award recipients are individuals who truly walk the talk.

I would like to honour Dr McKenzie and Mr Routledge by outlining aspects of their life stories, highlighting key principles that governed their lives as human beings, particularly as physical and health education advocates and professionals, and drawing parallels between them as leaders, educators, mentors, inventors and war veterans.

These two intelligent, innovative, compassionate, competent and multidimensional individuals advocated for improved health and fitness throughout their lives, making major contributions to physical and health education, recreation and dance in a variety of ways. R Tait McKenzie was a physician, surgeon, physiotherapist, professor, Scouter, author, athlete, physical educator and world-renowned sculptor. He was born in 1867 in Ontario's Lanark County. Although as a child he did not regard himself as an athlete, while a pre-med major at McGill University he developed an appreciation for athletics, boxing, gymnastics and physical training. His childhood friend James Naismith got him involved in teaching gymnastics to help pay for his schooling. Once graduated and actively engaged as a physician, surgeon and university instructor of anatomy at McGill, he became convinced that training, conditioning and physical exercise would prevent disease and physical breakdown, and thus pioneered physical fitness programs in Canada. His interest in art, particularly sculpting, arose from his knowledge of anatomy and his finding escape in art. Very supportive of the Olympic Games, he created the Joy of Effort medallion for the 1912 Games, in Stockholm. His many life's works are displayed around the world, with his most famous sculpture, *The Ideal Scout* (1937), standing in Philadelphia. He died in 1938 in Philadelphia at age 71, after spending the last seven years of his life back in Canada, in his childhood surroundings of Almonte, Ontario.

Robert Routledge was a teacher, coach, supervisor and director, and like McKenzie, also a physical educator, athlete, professor and Scouter. Born in 1915, he was raised with three siblings on a homestead during the Depression in the Lougheed area southeast of Edmonton. He earned his BEd under the Veterans' Charter and was hired at the new Victoria Composite High School in Edmonton, teaching physical education and mathematics. In 1955, he was appointed the assistant supervisor of physical education for Edmonton Public Schools. He was instrumental in the formation of the Alberta Schools Athletic Association (ASAA) and the Health and Physical Education Specialist Council (HPEC). By 1961 he had completed his MEd; he joined the University of Alberta's Faculty of Physical Education and Recreation and Dance in 1967 as

an associate professor. He was working on his PhD from the University of Oregon when his life was tragically cut short at the age of 55 in 1970 while attending a conference in Calgary.

I would like to revisit the principles that guided Bob Routledge's life and teachings as parent, teacher, coach, instructor, administrator and professor. It is amazing how significant and alive these same principles are today!

Routledge's Guiding Principles

Broad Participation

Mr Routledge believed that broad participation meant much more than the involvement of elite interschool teams and believed in involving as many individuals as possible. As a beginning teacher, he worked diligently to improve Victoria Composite School's intramural program as well as coaching the football team. He stressed that extracurricular activities should develop school morale through a sense of belonging for competitors and spectators alike. He believed that social, emotional and democratic maturity were developed by teaching respect for both teammates and opponents while engaging in physical education classes and intramural and extracurricular activities.

Inclusion

His students were encouraged to keep an open mind, with the knowledge and understanding that each one of us comes from some ethnic and cultural background. He wanted his students to recognize and accept that every person's background is worthy of respect and that no ethnicity or culture is intrinsically superior. Stated in his own words, Mr. Routledge believed that "every individual has a right to participate irrespective of gender, race, ethnicity, education, religion, social position, nationality or other possible cleavages resulting from intolerance."

Respect, Fair Play and Sportsmanship

Mr Routledge insisted on respect, fair play and sportsmanship, teaching his students that they should strive to be the best that they can be and strive to win while ensuring that opponents are allowed fair playing conditions and enjoyment of playing the game. He emphasized fairness and respect for self and opponents. He hated swagger-dancing, fighting, physical and mental bullying, and oppression of the weak by the strong.

Community Involvement

Mr Routledge was eager to involve everyone in a variety of physical activities in the community as well as at school. At age 24, in 1939, he travelled all over Alberta as the physical training supervisor for the Dominion-Provincial Youth Training Program. From 1938 until the mid-1950s, with his wife, Saralie, he taught at health and recreation summer camps in Red Deer. Throughout the 1950s, they also organized and conducted square dance clubs for Edmonton community leagues, travelling with a portable record player and a tin box full of vinyl records to various community halls throughout the city on weekday evenings.

Varied Physical Education Curriculum

In his 1945 student assignment for Dr Maury Van Vliet of the University of Alberta, Bob Routledge outlined his ideas of what should constitute a physical education curriculum. He stated that up to the end of high school, the program should include as many and varied activities as possible. He suggested that the activities include fundamental gymnastics and calisthenics, tumbling and apparatus gymnastics, weight training (not lifting), swimming, dancing, games of team type, boxing and wrestling, and games of the individual type.

Personal Fitness and Holistic Health

A strong advocate of personal physical fitness, Mr Routledge believed that fitness embraced intellectual and emotional growth as well as physical development. He stressed the importance of humour, humility and empathy and was always ready to poke fun at himself. He was nicknamed "Inverted," from teenage years throughout his air force days and well into his 40s because he walked about on his hands. Long before jogging became popular, he ran daily in summer and winter as well as doing the 5BX program regularly. Drinking and smoking were not a part of

his active, healthy lifestyle. For his own three children, he installed a chinning bar in the backyard and later in the archway between the kitchen and dining room.

These aforementioned principles remain relevant and significant in the educating of our students and teachers today. Dr McKenzie and Mr Routledge would be pleased if we could say that we have successfully followed even some of these guidelines as we work together in making a difference in the active living and wellness of our children and youth.

Working Together

There is so much happening in our world of physical and health education today; we need to be aware and discerning, combining our skills and knowledge in concerted, cooperative efforts to improve the well-being of our students. In reflecting on my personal historical past as teacher, teacher educator and researcher, I feel very confident in saying that we, as physical and health education teachers and teacher educators, make the biggest impact when we work together. We need to focus our thoughts and actions on initiating and adapting to change through ongoing active, collaborative partnerships and research projects to ensure that we *do* continue to make a difference. My most enjoyable, enlightening and productive experiences over the years have involved the collaborative action of preservice and inservice teachers, teacher educators and students. We had many opportunities to work and play together, functioning as an innovative team of experts in addressing a wide variety of pertinent issues with the intent to implement appropriate solutions for the betterment of the students.

Self-Study: The Basis of Effective Teamwork

Effective teamwork has to start with self-study early on in preservice teacher education, so that beginning teachers come to know who they are, cognizant of their personal and professional interests, beliefs, perspectives, biases and skills. Engaging young professionals in processes that allow them to become

comfortable and confident in being teacher-researchers throughout their careers is crucial. As they uncover and contemplate who they are and what they know, they will also become aware of what more there is to learn. Individual and group projects that demand coming to know oneself while remaining open to others' perspectives are integral to forming a teaching identity. Preservice teachers need to interact with both classmates and mentor teachers as peers and colleagues, learning how to express and support their beliefs, values and philosophies while questioning the views of others. If personal and professional growth are to occur, they need to have opportunities to practise leading, following and building relationships. There are many inviting, interesting ways of coming to know oneself. For example, engaging preservice teachers in critical storytelling, autobiographical narrative inquiry, self-study, participatory research, team-building inquiry and action research will contribute to developing a teaching self.

Confident, creative, caring, collegial, passionate, critical thinkers capable of playing advocacy roles will evolve: teachers who are able to question present and persistent issues regarding physical education, health and wellness, and who possess the knowledge, skills and understanding to educate students, parents, administrators and society of the values of developing socially responsible active citizens. Encouragement and practice in thinking globally about physical and health education will help prepare them to be leaders in diverse communities. Ideally, this education would begin with students in schools and continue throughout preservice teacher training and lifelong teacher development.

Collaborative Action

Collaborative research projects that demand the active efforts of physical education preservice and inservice teachers, students and teacher educators are key to making appropriate changes in the field of physical and health education.

Initiating and Adopting Change: Timing is Crucial

Today there are many exciting, enticing ideas, resources and programs related to physical and health education, active living and well-being. It is important that we are aware of the possibilities at local, provincial and international levels and make decisions to adopt, adapt and initiate change based on our expertise in light of the needs and interests of our students, in specific settings at a particular time. Be confident and proactive in using your passion and expertise to gather others together to create and support change.

Closing

I know that Dr McKenzie and Mr Routledge would be proud of you. I know that I am extremely proud of you! Even though there is still much more to do—and undo—our "successes are due to a collaborative spirit and a generosity. Working together we are clearly much better than the sum of our parts" (Dr P Armstrong, University of Alberta cardiology researcher, 2014). I know that we can work together to continue educating others in the spirit of R Tait McKenzie and Robert Routledge so that persons choose to lead healthy, active lives.

Thank you for this opportunity to create another fantastic memory of PHE Canada and HPEC. Never underestimate the power of enjoyment through physical education and healthy, active living.

Notes:

1. Special thanks to Dave Routledge for sharing insights about his father, Robert Routledge.

2. Some content from this memorial address was removed or edited for publication purposes.

Think Like a Mountain

Nadeen Halls

Reflective Thoughts from the Shaping the Future Conference 2015

Aldo Leopold, the early 20th century's Henry David Thoreau, said that we should think like a mountain, with a sense of permanence and a long view. At the beginning of the 21st century, we are at a peak of human power, wealth and information ... We need to look back at our wonderful natural and human heritage, and cherish and protect the abundant values to be found there. We need to look out to the sides and see other parts of the world that need our help and can provide good ideas to go forward ... We need to look ahead to be certain that our actions of today will make the world a better and richer and more varied place for our grandchildren and their grandchildren.

—Robert Bateman

Robert Bateman speaks of our need to protect and learn from our natural world in his book *Thinking Like a Mountain*. At the recent Shaping the Future 2015 Conference (www.everactive.org), approximately 450 delegates had the opportunity to "think like a mountain."

How do the stories we create, share and hear inspire us to shape the future? How can a gathering nestled in the mountains of Kananaskis Country allow us to connect with self, others, a community of like-minded individuals? How can we celebrate the wisdom we share, feel, experience in this mountain setting and take it home to create new stories? How can we think like a mountain?

We gather to *inspire*. Nestled within the mountains, we are reminded of the wisdom these peaks hold from centuries of being on Earth, and they help to guide us. We feel excited by the energy, the dreams and the big ideas. We gather as storytellers. *Pause*. As the sun rises over the mountain peaks, the energy flows toward a common passion within the conference. The in-between dreams and celebrations of the storytellers begin to shape our thoughts, our feelings, our wisdom. This is hard work.

We gather to *connect*. We work together—a wolf pack—a community. The mountains are gazing upon us and listening. *Pause*. The comfortable aroma of a forest. The awesomeness of mighty blue and grey peaks. The breathtaking brilliance of pink and orange sky. The glistening light of the stars that guide us through the night. We connect with self, with others, with the community to learn the wisdom of the stories. We understand how we can begin to think like a mountain. How we can provide good ideas to move forward?

We gather to *celebrate*. Our stories are strong. We sing out loud. We dance as one. We smile at one another. We trust each other. We honour our mentors. We are proud. We begin a new journey. *Pause*. The freshly fallen snow

incites our play and a new-found energy. Our narratives are being written. Our spirits are awakened. We are thoughtful. We will tell the stories. We know the good work to inspire. We are well.

We need the tonic of wildness …

—Henry David Thoreau

Plan to attend the next Shaping the Future Conference, in January of 2016 (www.everactive.org/shaping-the-future).

Reference

Bateman, R. 2000. *Thinking Like a Mountain*. Toronto, Ont: Penguin.

Effective Teaching of Elementary School Physical Education: The Importance of Linking Effectiveness with Active Lifestyle

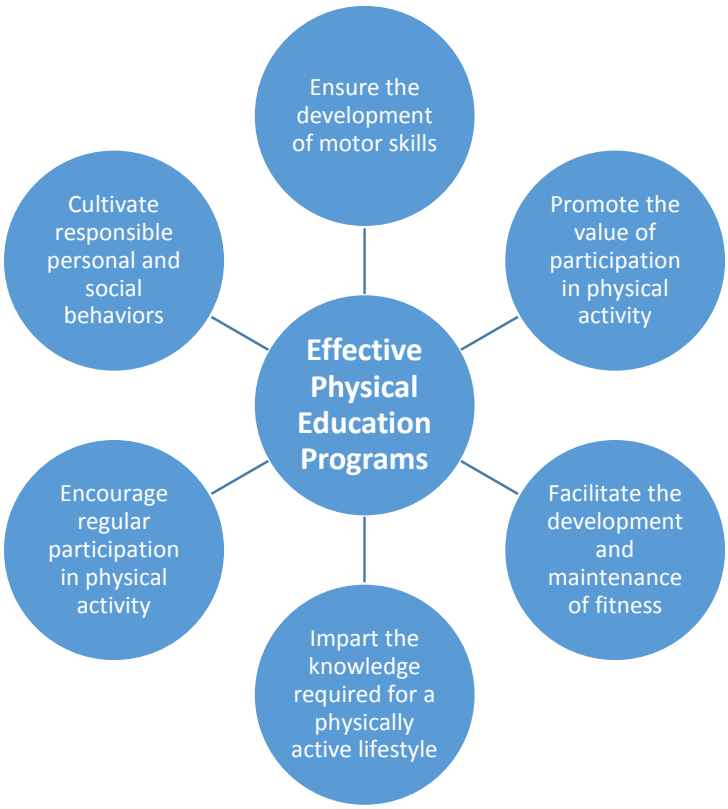
Brent Bradford and Clive Hickson

The rising costs and consequences of choosing to live physically inactive lifestyles are reaching concerning levels (Hales and Lauzon 2013; Heart and Stroke Foundation 2015; McKenzie 2003; Pangrazi and Beighle 2010). However, physical education programming has the potential to help shape the role physical activity and healthy living play in our lives (Heart and Stroke Foundation 2015; Hellison 2003; McKenzie 2003; Rink and Hall 2008). According to Rink and Hall (2008), the most physically active adolescents and adults are likely to have experienced quality physical activity and sport experiences as young school children (Rink and Hall 2008).

"In-school physical education has the potential to reach a far greater number of students than any other kind of physical activity structure" (Hellison 2003).

Hence, preparation for lifelong participation in physical activity involves laying a foundation of physical literacy, which is most likely to occur when students participate in effective physical education programming. Six target areas must be met for a physical education program to be considered effective (Rink and Hall 2008); Figure 1 illustrates these six target areas.

Figure 1. Six target areas for effective physical education programming



In terms of Figure 1, one of the most critical of the six target areas is the development of motor skills, both competence in performing them and confidence in employing them, both of which are established through early experiences in physical activity and sport (Solmon 2003). Solmon's belief has been shared by Fishburne (2005) and Haywood and Getchell (2014); sensitive time periods for motor skill development occur in a child's early years of school, and although motor skill development is subject to change over the entire life span, the elementary school years are critical years for determining optimum development.

"Students develop a sense of competence or lack of it largely through previous experiences of success and failure" (Rink 2003).

In order to establish effective physical education programs that promote physical literacy, it is crucial for researchers to continue to assist and work with teachers to identify characteristics and practices of teaching effectiveness that can be incorporated into daily teaching. If achieved, opportunities for student learning can be increased and student physical literacy promoted.

"Students in elementary school must understand that class time in physical education is learning time, and that the gymnasium or other physical education settings are places for learning—just like all other classrooms in the school" (Metzler 2005).

With respect to teaching effectiveness in physical education, Hickson (2003) suggested that studies indicate that teachers can often perceive their teaching practices to be effective. This self-evaluation of effectiveness is based primarily on the teacher's own perception of important teaching criteria (eg, feedback, demonstration, student enjoyment). In a review of research, Rink and Hall (2008) asserted that effective teaching occurs when students acquire the skills to lead physically active lifestyles. According to Metzler (2005) and Rink and Hall, effective teachers of physical education

- promote learning outcomes related to physically active lifestyles,
- develop learning opportunities to reach intended learning outcomes and
- assess the extent to which intended learning outcomes have been achieved.

Therefore, the determination of effectiveness of physical education teaching must not be confined to the instructional processes and learning opportunities only in the gymnasium and the other areas where physical education programming is taught but, most important, must also consider the influence on student activity choices beyond the school day and outside of the school environment.

What does this mean for physical educators? Effective physical education teachers need to fully understand the importance of developmentally appropriate instruction and programming that allows students to attain motor skills in order to increase confidence and motivation to participate in healthy, active living choices both in school and in their communities. Students who are engaged in programming that encourages a high level of learning have a greater chance to achieve this goal.

Therefore, teachers must be effective in several key areas, which are described in Table 1. We suggest that effective teachers are cognizant of and work toward ensuring that student learning experiences are planned, establish lessons that are motivating, deliver developmentally appropriate programming and use assessment strategies that encourage active lifestyles.

Concluding Thoughts

The definition of effective teaching has changed considerably over time (Hickson 2003). These changes recognize not only teaching decisions and behaviours, but also the critical importance of student learning opportunities. However, with the many concerns about personal health that are presently being identified due to the consequences of choosing a physically inactive lifestyle, the definition of effectiveness needs to be broadened. Similar to elementary school teachers trying to develop a love of reading in students when they teach the reading process, we, too, need to develop in our students a desire to be active. If students are active only in our physical education lessons, we are not likely to positively affect the health trends that are becoming an alarming reality for our communities. Ensuring that students develop their physical literacy so that they know how to and are able to move efficiently, understand why they should be active, and choose to follow a physically active lifestyle is critical. Therefore, any consideration of effectiveness in physical education teaching needs to incorporate measures of not only what and how we teach and student learning opportunities, but also whether that learning is applied to the students' lifestyles beyond the school day. Our effectiveness must consider and acknowledge what occurs outside of the school environment.

This may undoubtedly be a challenging task to achieve. However, it is necessary for us to accept this responsibility, because who else is likely to take on this challenge? Without our involvement, where will our students be tomorrow?

Table 1. Effective teaching of physical education

Ideas For Increasing Effective Teaching of Elementary School Physical Education	
Planning	• Effective teaching does not happen naturally; we need to constantly challenge our thinking. • Learning is best facilitated by planning well beyond single daily lessons. • Always consider developing content with a progression of tasks that lead students toward higher levels of competency. • Take steps to maximize class activity time and always link class learning to activity choices beyond the school environment.
Establishing Motivating Lessons	• For many elementary school-aged students, routines can increase personal feelings of comfort and enjoyment. Because enjoyment is a key motivator to be physically active, creating routines that increase such enjoyment are critical. • Establishing clear and understandable routines not only facilitates student awareness of particular expectations, but also creates more time for activity learning and opportunities to link that learning with future activity choices. • Effective teachers of physical education not only have clear expectations for students, maximize engagement time with developmentally appropriate content and are able to adjust and modify activities, but they also create learning opportunities that are exciting for students and are linked to activities beyond the school environment. • Effective teachers help students develop motor skills so that they are better equipped to choose physically active lifestyles.
Delivering Developmentally Appropriate Programming	• Motor skill acquisition is best achieved when activities are planned and delivered with student success in mind. • Students become frustrated when activities are too easy or too difficult. Such feelings do not lead to students wishing to further their experiences beyond the class. • However, by creating opportunities for students to successfully engage in physical activity, effective teachers can increase students' confidence levels. • Increased student confidence increases the chance that students will choose to participate in activity outside of school.
Using Assessment Strategies That Encourage Active Lifestyles	• Assessment needs to encourage active lifestyles. • While it is important to still provide such things as skill assessment to understand areas of strengths and weaknesses, formative assessment needs to also focus upon suggestions and ideas to encourage students to participate in activities outside of school. • Students can be asked to do activities for homework that have them being physically active at home. • Assessment instruments should not only focus on in-class activity, but also incorporate parts that recognize at-home activity or student self-reflection on being active outside of school.

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Comprehensive School Health in Six Priority Areas: The Work of an Education and Health Partnership

Pan-Canadian Joint Consortium for School Health

Health and education go hand in hand: healthy children learn better, and better-educated individuals tend to be healthier for life.

There are high demands placed on educators: to teach the curriculum of the province/territory while providing students with a learning environment that will inspire them, assist them in becoming globally aware adults and protect them from dangers. In addition, schools are asked to be the settings where children and youth also cultivate healthy behaviours (Mohammadi, Rowling and Nutbeam 2010). Without some integration of the forces that affect the business of schools, these can be overwhelming tasks.

For the past 30 years, schools in Canada and in many other countries have integrated the work of education and health in the school setting into a framework known as comprehensive school health (CSH).

What Is Comprehensive School Health?

Comprehensive school health is a process used by a school community to optimize student achievement through integrated school health initiatives. This approach advances a school health climate also known as health-promoting schools or healthy school communities.

Recognized internationally by the World Health Organization (WHO) and schools across the globe, CSH involves educators, administrators, students and school community partners: parents, public health professionals, community organizations, coaches, sport and recreation facility managers, and many others.

The purpose of CSH is to bring about a school climate to support optimal health and learning outcomes. This is done when the school community addresses priority actions and initiatives through four distinct but interrelated pillars:

- Teaching and learning
- Physical and social environment
- Healthy school policies
- Partnerships and services

What Is the JCSH?

The Pan-Canadian Joint Consortium for School Health (JCSH) is the collective voice on comprehensive school health of the ministries of Education and Health across the country. Quebec, though not a member, communicates and shares practices and evidence; and the Public Health Agency of Canada provides support and advice. The JCSH was created in 2005 by the 24 ministries in 12 of the 13 provinces and territories and the federal agency in order to facilitate an integrated and coordinated approach to health promotion in the school setting.

The JCSH supports CSH initiatives nationwide, serving as a catalyst to strengthen cooperation, share information and promote best practices (Pan-Canadian Joint Consortium for School Health 2010).

What Does Comprehensive School Health Have to Do with Student Achievement?

The connections between educational achievement and lifelong health are well established. The association that has been more difficult to make but is now being recognized is the influence of health on education achievement (Young, St Leger and Blanchard 2012; Basch 2011).

Comprehensive school health initiatives are a worthwhile investment. They complement and enrich education priorities. Research shows that this approach can lead to improvements in student achievement and promote lifelong health and wellness (Mirowsky and Ross 2005).

Does Comprehensive School Health Mean More Work for My School Staff?

Taking a comprehensive school health approach does not mean more work; it means looking at school health in a different way. For example, the JCSH addresses its efforts to advance CSH through six topic areas – areas that are important in any school: positive mental health, physical activity, healthy eating, substance use, injury prevention and healthy relationships.

Addressing comprehensive school health in six substantive areas:

- Positive mental health
- Physical activity
- Healthy eating
- Substance use
- Injury prevention
- Healthy relationships

As an example, your high school recognizes that student engagement is not as strong in the higher grades as in the earlier years. You realize that engagement has an impact on student achievement, that more involved students tend to perform better academically. A CSH approach may involve taking steps with a positive mental health focus as the substantive area you want to address. Steps in the four pillars might include the following:

- Healthy school policy: develop a policy that your school will accommodate the social and learning needs of every student in the school, including those with exceptionalities.
- Teaching and learning: support autonomy by minimizing teacher control of student projects, and by listening to and validating student perspectives. Support learning environments that recognize and advance both university and non-university learning tracks.

Please check out the Positive Mental Health Toolkit at www.jcsh-cces.ca.

- Social and physical environment: provide a welcoming and student-centred environment and encourage student involvement in decisions affecting the school community.
- Partnerships and services: collaborate with families in school learning and improvement, and offer students opportunities in school–community action groups. In addition, use the Positive Mental Health Toolkit's action plans for students and school staff.

Six Substantive Areas and Comprehensive School Health

The JCSH has selected the above-noted six substantive areas for focus. What do these areas mean in the life of a school community and in the ability of each student to achieve optimally in school?

- **Positive mental health:** The Public Health Agency of Canada describes positive mental health as "the capacity of each and all of us to feel, think, and act in ways that enhance our ability to enjoy life and deal with the challenges we face. It is a positive sense of emotional and spiritual well-being that respects the importance of culture, equity, social justice, interconnections and personal dignity" (Morrison and Peterson 2011).

- **Physical activity**: The World Health Organization defines physical activity as any energetic bodily movement produced by skeletal muscles. The WHO advocates that children between the ages of 5 and 17 need at least one hour of physical activity each day in the forms of "play, games, sports, transportation, recreation, physical education or planned exercise, in the context of family, school, and community activities" (WHO 2010).
- **Healthy eating**: A complex term that takes into account a number of factors, healthy eating involves elements of foods, such as fat, sugar and sodium content; values about foods and cultural, geographic and socioeconomic considerations; and ways of eating and attitudes toward food (Paquette 2005).
- **Substance use**: For the purposes of the work of the JCSH, any use of tobacco, alcohol, illicit drugs or medications outside of prescribed medical directions falls under the topic area of substance use.
- **Injury prevention**: The Health Behaviour in School-Aged Children (HBSC) study defines injury as any bodily harm externally caused, and includes sprains, broken bones, cuts, burns and ingestion of poisons. These can be sustained from sports activities, fights, failure to wear a helmet and motor vehicle collisions, among other examples.
- **Healthy relationships:** The HBSC study (2010–11) and PREVNet each draw attention to the relationships that children and youth have within family, peers and school networks. This area also reflects and includes sexual health and relationship challenges from difficult social contexts, bullying, other victimization and sexual orientation (Pepler, Craig and Haner 2012).

How Will My School Benefit from a Comprehensive School Health Approach?

Comprehensive school health recognizes that schools and communities have a common interest in supporting student health, and capitalizes on supports and services in the community (Pepler, Craig and Haner 2012).

> "Schools are complex, evolving organisations that have to deal with many conflicting demands for time, resources and attention" (Samdal and Rowling 2013, xv).

In addition, improvements in health behaviours, such as physical activity during and after school, recess play and physical education all show positive associations with improved test results, academic behaviours, and cognitive skills and attitudes (Centers for Disease Control 2010).

Research shows that we get the best results when education and health professionals work together as partners—understanding and valuing each other's roles (Cairns and Harris 2011).

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Stories from the Field

Pan-Canadian Joint Consortium for School Health

The accounts below are just a few of the innovative and varied approaches and commitments to student achievement and student health in Canada.

Yukon

MindUP

The MindUP program has been shown to help children and youth become focused and mindful learners, fostering confidence and a better sense of self and others.

The MindUP program is a K–8 social–emotional learning program based on the brain research of Dan Siegel and the Hawn Foundation. The curriculum provides students with background information on the brain, including brain facts and basic brain physiology and functions. It helps children learn how to calm themselves in moments of stress, focus attention and, thereby, regulate themselves.

Here in the Yukon we have provided training to over 120 educators, and the program is available in all Yukon elementary and some of our secondary schools. We embarked on the MindUP program because we were looking for a program that focused on the development of internal assets. We wanted to help make sustainable changes in our children by taking a developmental approach and by providing children with opportunities to become more mindful and reflective of their choices and thus to own and internalize these choices.

The program consists of teaching students how to become mindful of their breathing through a core practice of belly breathing and attentive focusing on their breath three times a day. The students become more observant of their own learning process, and understand how to respond to the world reflectively instead of reacting or acting without thinking. There are also lessons about optimism, empathy, kindness and generosity.

British Columbia

Healthy Schools BC

Healthy Schools BC (HSBC), a key initiative of the province's health promotion strategy, strengthens health–education partnerships and builds the capacity of both sectors to support the implementation of the comprehensive school health (CSH) approach in BC schools. The initiative involves a partnership between the ministries of Health and Education, and the Directorate of Agencies for School Health (DASH) BC (http://dashbc.ca).

A joint leadership table with health and education sector representation has been convened to help guide the provincial healthy schools agenda. At the regional level, health authorities and education partners are consulting on how to work together most effectively using the CSH approach.

On the ground, HSBC supports schools and districts in a step-by-step process to complete healthy schools assessments, and develop and implement customized action plans across the pillars of CSH. How-to guides and online learning sessions are being used to promote CSH knowledge and skills among both the health and education sectors. The HSBC portal (www.healthyschoolsbc.ca) consolidates news, programs, resources and tools into a new "one-stop shop" for healthy schools information. A student-led action research model has integrated youth leadership into the initiative, and a Healthy Living Youth Council has been established to provide leadership training and support to student-driven healthy schools initiatives.

Alberta

High Schools: Making the Wellness Connection

At Central Memorial High School, in Calgary, lineups are common at the hydration station where students fill up their water bottles; the counter on the station tracks the number of bottles filled. Students now carry

their bottles to school and the station has become a teaching tool for teachers to talk about hydration, recycling, land fill use and body chemistry.

At Lethbridge Collegiate Institute, the Health Incentive Program (HIP) has students earning points for doing anything that affects one or more dimension of their wellness. The online tool allows students to set and track their wellness goals. The impetus for HIP came from the school's Student Wellness Action Team (SWAT). To prepare for the HIP launch, staff spent professional learning time considering the importance of wellness, the dimensions of wellness and where wellness can be embedded in the curriculum.

The new food cart prepared by the culinary arts students at Centennial High School, in Calgary, is stocked with healthy options for snacks and lunch. All the food sold off the food cart meets the Alberta Nutrition Guidelines for Children and Youth and sells for less than $5. The marketing campaign and all the daily running of the cart are planned and handled by students. An added bonus is that many of the students stay on campus for lunch now, and the students who were often late and absent after lunch are now on time.

Across Alberta, high school wellness projects are strategically embedding wellness into the daily lives of students and staff.

New Brunswick

Nord Ouest Francophone School District Embraces a Mental Fitness Approach

The Nord Ouest Francophone School District, in collaboration with the Department of Healthy and Inclusive Communities through the NB Wellness Strategy, has been implementing a whole-school approach to promote mental fitness and resilience by offering workshops to all school employees.

Schools identified comprehensive interventions that met the psychological needs (competence, autonomy and relatedness) of students according to the self-determination theory that is now used throughout the school (not limited to one program or the classroom). Evaluation indicated that participating schools saw increased performance on the provincial evaluations as well as a positive impact on student behaviour and significant decreases in suspensions.

> "I include the concepts of mental fitness and resilience in my code of conduct and my disciplinary code, my daily contact with the students, as well as my work/teaching plans for the students. It is an approach that works well with my teaching style and my philosophy of education. I am pleased to see that these concepts have been presented to all teaching staff because we have a student population that is more and more demanding because of today's society and the life experiences that the students have faced in the past few years" (feedback from an educator involved in the Nord Ouest Francophone School District approach).

Schools are attaining the learning outcomes set out in their curriculum while satisfying the psychological needs of students and adults in the school. Students have the chance to apply what they learn to the daily reality of life, and the school becomes a living environment that encourages promotion and development.

Nova Scotia

Envisioning HPS

Regional health promoting schools (HPS) cochairs and staff from the Nova Scotia departments of Education and Health & Wellness gathered to envision HPS in Nova Scotia and develop the best possible structure to move work ahead. There was a compelling need to do this type of work right now: an evaluation report highlighted room for improvement; there are different people involved; and there are changing contexts such as resources, initiatives and strategies. The sands had shifted over the years and it was time to envision what HPS should be in Nova Scotia and then use that vision to guide the work of everyone involved, from all corners of the province and from all levels of partners.

The diverse group came up with several similar draft vision statements, which will be crafted into one statement to be used for years to come as a compass to guide the work. A number of key areas, such as communication, partnership and leadership, were identified to ensure that the vision is carried out in

ways that are grounded in evidence and that respect local needs and resources. Next, a new structure will be put into place to ensure that these efforts move forward, engaging all the right people to make things happen.

It's fair to say that the leaders of HPS in NS are excited at this new, explicit direction and are as passionate as ever about making a positive difference in our school communities.

Newfoundland and Labrador

Western School District

5-2-1-0 Campaign

This year, schools in Western School District were encouraged to participate in the 5-2-1-0 campaign. These four simple numbers can help educate and encourage families to eat healthily and be active with a daily intake of

- 5 or more fruits and veggies,
- 2 hours or less of TV and screen time,
- 1 hour of physical activity and
- 0 sugary drinks.

Schools participating in the campaign were provided with a variety of resources to promote good health, including posters, newsletters for parents, lesson plans, student challenges and a cash grant to implement a Nutrition Month activity in March. Response from schools in the district has been excellent.

Eastern School District

Let Them Be Kids

Last year, four schools in Eastern School District were awarded Let Them Be Kids playground grants. These grants provided funding for school communities that may not have had other play areas to build safe play spaces. Each school community held a Build Day, which brought together the school community to complete and officially open their facility.

A Treadmill in the Classroom

When Peter Ardis spotted a manual treadmill being thrown out with the garbage, he knew it could complement his students' learning, development and overall physical activity levels. Ardis's Grades 3 and 4 students use the treadmill as part of their mathematics numeration, measurement and data relationships units. Students use the treadmill to improve physical activity levels while recording and comparing individual and class distances through graphing, tables and charts.

News from the Rock

Study Finds Gap Between Aims of Canadian Physical Education Curriculum and Expectations

Sandy Woolfrey-Fahey

A study of physical education curriculum across Canada has found that while the curriculums' stated aims are focused on healthy active living through physical activity, the actual learning outcome statements focus primarily on movement skills, games and sport techniques.

The research, published in the international academic journal *European Physical Education Review*, was led by Michelle Kilborn, PhD, assistant professor with the School of Human Kinetics and Recreation (HKR) at Memorial University of Newfoundland; Jenna Lorusso, Western University; and Nancy Francis, EdD, Brock University.

Beginning in January 2013, the study involved an in-depth analysis of Grades 1–9 physical education curriculum documents from all provinces and territories and sought to gain a deeper understanding of physical education across the country.

"Our examination found a conflict between the curricular vision for physical education and learning expectations for students," explained Kilborn. "Physical education vision statements are trying to point us toward more holistic ways of teaching children how to live healthy, active lifestyles, but the specific learning outcomes still largely focus on evaluating a student's physical skills, such as running, jumping and throwing."

The researchers conducted the study, "*An Analysis of Canadian Physical Education Curricula*," in order to help contribute a Canadian voice to the international discussion on physical education.* They hope the findings become a catalyst for discussion and lead to a shift from a performance-driven, competition-oriented delivery of physical education in Canada to a more participation-driven, lifestyle-oriented curriculum.

Kilborn, who is a curriculum studies scholar, wants to remind people about the value of physical and health education in schools. "We know that healthy, active living goes beyond learning sport skills," she said. "We are encouraging provinces and territories to consider what has, is and should be influencing decisions about curriculum development and reconsider what it means to teach children to be healthy active citizens."

Kilborn and her colleagues in HKR are reinforcing the message about healthy active living. They will also release a study at the end of this month highlighting programs that promote healthy, active living for school-aged children and youth. Their study focused on the island portion of Newfoundland and Labrador.

*Editor's note: "*An Analysis of Canadian Physical Education Curricula*" was published online by the *European Physical Education Review* on June 1, 2015.

Multisector Healthy Active Living Strategy Needed for Children in Newfoundland

Sandy Woolfrey-Fahey

A recent report explored the gaps and opportunities of healthy active living initiatives and programs for school-aged children and youth in Newfoundland.

Michelle Kilborn, PhD, assistant professor with the School of Human Kinetics and Recreation (HKR) at Memorial University, led the Healthy Active Living in Newfoundland Research Project, along with HKR's Erin Cameron, PhD, Erin McGowan, PhD, and Linda Rohr, PhD, through partnership funding from Recreation Newfoundland and Labrador and the Government of Newfoundland and Labrador's Department of Seniors, Wellness and Social Development.

"The future of this province is only as healthy as the next generation," said Kilborn. "Building a culture of healthy active living with a more holistic wellness-

oriented approach has been identified in this study as essential to improve the health and wellness of children and youth in Newfoundland. Programming must include a balance of physical activity, mental well-being and healthy eating."

Kilborn and her team recognized that more knowledge was needed about the existing types of healthy, active living initiatives that target children and youth in Newfoundland. For this study, they conducted an environmental scan to provide a better understanding of the landscape of such activities across Newfoundland.

This study comprised three parts: a review of literature and an online scan of programs related to healthy active living; focus group meetings with key representatives from the healthy active living community; and an electronic survey distributed to education, sport, recreation, health and community partners.

The report lists 12 recommendations (see below) and encourages the Government of Newfoundland and Labrador to use the information for community, regional and provincial strategies and planning to more effectively support a healthy Newfoundland population. Recommendation themes include facilities, programming, program leaders, funding and evaluation.

"The provincial government has demonstrated a commitment to helping people and communities achieve lifelong active health and well-being through government initiatives," said Kilborn. "While supporting community programs is an important component of promoting wellness, it is a challenge to coordinate these programs effectively and understand the impact these initiatives have on health, learning and performance outcomes."

It is evident that participants believe there is an appropriate amount of programming for school-aged children, and respondents are proud and appreciative of what is offered to youth. However, the majority of healthy, active living programming for school-aged Newfoundlanders is focused on physical activity, with few initiatives that provide opportunities to participate in healthy eating and positive mental health activities. A shift in what is being offered needs to reflect commitment to a holistic approach. Researchers also identified many programs that needed improvements to funding, resources, expertise, prioritizing of healthy active living, diversity and partnerships.

Analysis indicates that a multilevel, collaborative strategy among different sectors and communities is needed to ensure better balance and a more interconnected approach to promoting healthy active living for children and youth. Improved communication of successes and best practices would also be beneficial, as well as a comprehensive, ongoing evaluation process that is accessible and available to the public.

Healthy, Active Living in Newfoundland Research Project's Recommendations

General

- Design a multilevel, collaborative strategy to ensure better balance and a more interconnected approach to promoting healthy active living for children and youth.
- Develop an updated government-wide strategy focused on enhancing the health and wellness of children and youth that includes multiple departments that target objectives in their business plans to meet the government-wide wellness priorities that include all dimensions—mental, physical, emotional and spiritual.
- Foster better partnerships among government, university researchers and community organizations to help inform future strategies and initiatives.

Facilities

- Make improvements to the built environment, especially indoor spaces for physical activity.
- Consider sharing and using spaces in a more comprehensive way to help improve opportunities for healthy active living among children and youth.

Programming

- Focus on a balanced, healthy, active-living approach with programming that is accessible, affordable, inclusive and developmentally appropriate.
- Because schools are a focal point for healthy active living in most communities, provide additional funding for comprehensive school health programs to improve the compartmentalized approach currently prevalent across the province.

- Provide better education and information for organizations about how to merge healthy eating, physical activity and mental well-being activities.

Program Leaders

- Government, working together with communities, should consider how to sustain programming and promote a more holistic approach.
- Provide support, training, recognition, updated information, contemporary techniques and evidence-based professional development for program leaders to support a holistic lifestyle approach.

Funding

- Review program access and affordability to support better healthy active living in all communities.
- Address issues such as affordability of healthy foods, access to mental health promotion programs and providing organizations with improved support (resources, education, guidance) for healthy eating and positive mental health.
- Fund training for leaders on how to actively incorporate all the dimensions (mental, emotional, physical, spiritual) into a program regardless of primary objectives, setting and/or population.

Evaluation

- Review current and future programs and include an evaluative component to ensure that programs are meeting the needs of the community and addressing all dimensions holistically.
- In partnership with university researchers, develop an evaluation package that can provide needed support to program leaders and communities for expertise and consistent measures that can be archived to establish trends and inform planning.

Community Connections Spark a Healthy Living Movement

Jennifer Gray

"How can we possibly make a good decision?" one student questions while his classmates stand positioned around the vending machine at Vivo. After having spent a morning with a nutritionist exploring food labels to discover the sugar content of common recess snacks, the students sought to apply this new skill, only to discover that they could not read the labels of the snacks that lay displayed in their rows behind glass. Frustrated by the lack of information to make a healthy choice, the class begins to generate ideas on how a vending machine could be improved to provide the necessary information required to choose well. A lengthy list of innovations emerges, and one student suggests they could even contact the company to share their ideas. Later that afternoon, the class walks to the neighbouring grocery store to further apply their newly gained nutritional understandings. As nutritionists, they work to select and purchase a recess snack to share with their group that is not only within the set budget but also meets the nutrition standards they have set as a class. Immersed in an innovative and collaborative environment, Healthy Living School at Vivo for Healthier Generations sparks students to discover, explore and embody health and wellness.

Part of the Campus Calgary/Open Minds (CC/OM) program, Healthy Living School is not a field trip but an opportunity for teachers and students to move their classroom to work alongside experts in a vibrant community setting for a week-long interdisciplinary study. Teachers begin the journey with an inquiry that is embedded in their year, and the week on site becomes a catalyst for deep and rich learning that is connected to all curricular areas.

Alberta Education (2009) describes the need for students to be educated, informed and contributing members of society and to develop the knowledge, skills and attitudes needed to be well in every sense of the word—emotionally, intellectually, physically, socially and spiritually. A week at Healthy Living School provides a wide scope of opportunities for students to understand wellness and how it relates to everything in our world. Going beyond the obvious, students engage in a variety of tasks that encompass all curricular areas to further their inquiry. Whether it is touring the unseen workings of the pool, investigating the LEED-recognized attributes of the building, sketching public art or interviewing library staff to discover a library's impact on community, each week at Healthy Living School follows a different path of learning that is customized to meet the needs of each class. Journals provide a space for students not only to document their experience but also to reflect and make personal meaning.

Teachers are codesigners of learning tasks as they collaborate with the CC/OM educational coordinator and Healthy Living School coordinator to plan a week on site that incorporates student voices. A week includes daily active sessions that expose students to new ways of movement, such as yoga, drum fit and Zumba, and encourage new passions for physical activity. Alongside experts, students explore the inner

workings of the recreation centre, then move beyond to community neighbours and partners. Students develop a clearer vision of their community and how they can become informed learners and involved citizens. This experience inspires students, teachers, classes and schools to act on health and wellness initiatives in their personal lives, classrooms and schools. As healthy living ambassadors, students share this work with their families, and parents report changes in their children's attitudes toward healthy eating and physical activity. This experiential learning opportunity allows students to *be* the active and healthy learners they are and to intentionally engage in the discipline of wellness.

The 19 weeks of Healthy Living School at Vivo for Healthier Generations is proudly supported by Cenovus Energy. For more information, visit http://ccom.cbe.ab.ca and http://vivo.ca/Pages/RaiseTheBarHealthyLivingSchool.asp.

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Graduate Student Articles

Pedometer Use with Elementary Students: Does the Technology Justify the Investment?

Cheryl Shinkaruk and David Chorney

Abstract

Objective: To determine whether the technology justifies the investment of teacher intervention through professional development and curricular support and whether it will affect student activity levels during school and nonschool days.

Methods: Data was analyzed from Grade 4 students at two Catholic schools in a large city in western Canada. Students wore time-stamped pedometers for nine consecutive days in the fall and spring each year from September 2009 to June 2012. In the first year of the study, 130 students were included in the step count data analyses. Students completed a qualitative survey, which sought responses dealing with the physical activity behaviours and personal opinions about pedometers. Throughout the study, the Grade 4 teachers at the intervention school received professional development opportunities to enhance their teaching strategies on how to embed physical activity and movement throughout the school day and support a quality physical education program.

Results: Students took significantly more steps per day on school days than on weekend days (school days: 11,481 ± 3,601 steps/day; weekend days: 10,307 ± 352 steps/day; $p<0.001$). Students took significantly more steps during school hours than before or after school hours (school hours: 6,711 ± 1,886 steps; outside school hours: 4,769 ± 2,452 steps; $p<0.001$). In a typical week, the intervention school had higher levels of physical activity than the control school. According to the student survey, the pedometer served as a motivational tool in both schools because students wanted to wear pedometers more often, since they receive instant feedback about their step count. The most noteworthy finding was that in the intervention school, the data indicated that the teachers were able to apply their learning about how to increase physical activity levels throughout the school day.

Conclusion: Targeted professional development time with teachers may increase physical activity levels in their students throughout the school day and during nonschool hours. The pedometer may be used as a motivational tool for the teacher to increase step count and improve attitudes toward being more physically active during school hours and nonschool hours for the students.

In recent decades, rates of unhealthy weights among children have risen steadily. "Today, more than *one in four* children in Canada are overweight or obese" (Public Health Agency of Canada [PHAC] 2012, 1). To guide a collaborative approach to the health and well-being of children, the federal, provincial and territorial ministers of health in Canada released a document entitled *Curbing Childhood Obesity: A Federal, Provincial and Territorial Framework for Action to Promote Healthy Weights* (PHAC 2012). It should be noted that Canada is not alone in this struggle with childhood obesity. In 2011, the World Health Organization stated that "Physical inactivity levels are rising in many countries with major implications for the prevalence of noncommunicable diseases

and the general health of the population worldwide" (World Health Organization 2011, 1).

Since most children spend approximately one-half of their waking hours during the week in a school environment, there is an opportunity to enhance the amount of time being physically active in the school environment. Is it possible for teachers to make an impact on the amount of physical activity a child participates in throughout the school day or on non-school days? Do teachers understand how to increase student physical activity levels throughout the school day? Teachers need guidance and support on how to encourage active learning to occur throughout the day. Creating supportive environments for teachers and students is one step toward addressing the obesity epidemic in children.

The primary purpose of this study is to determine whether the technology justifies the investment of teacher intervention through professional development and curricular support and whether it will affect student activity levels during school and nonschool days.

Methods

Grade 4 students from two Catholic Schools in a large city in Alberta, Canada, wore time-stamped pedometers for nine consecutive days in the fall and spring each year from September 2009 to June 2012. All students in Grade 4 at both the intervention school and the control school were asked to participate in the study. Parental consent forms were sent home in the month prior to beginning the data collection. Only those students whose forms were returned to the teachers were allowed to participate in the study. The return rate was 98 per cent for the two schools. In the first year of the study, 130 students were included in the step count data analyses. In the second and third years, 69 and 44 students respectively were included in the step count analyses.

Additionally, all students who received parental consent were asked to complete a qualitative survey that sought responses dealing with daily physical activity behaviours and opinions regarding the use of pedometers. Throughout the study, the Grade 4 teachers at the intervention school received professional development opportunities and curricular support to enhance their teaching strategies to embed physical activity and movement throughout the school day and how to support a quality physical education program. Teachers at the control school did not receive any professional development or curricular support during the three-year study.

An additional piece of the data collected for this study had the students keep track of their physical activity during the week that they wore the pedometers. These physical activity diaries were to be updated daily, and a few minutes of time at the start of each school day was set aside to allow all students the opportunity to record which activities they had participated in the day before, if they had.

Study Design

Each phase of data collection provided seven full days of data. Pedometers were worn on the right hip, directly in line with the right knee. Pedometers were worn during all waking hours, unless showering, swimming or participating in activities for which an adult deemed it unsafe to wear. During each phase of data collection, students kept a diary of their daily physical activities including the duration of each activity and whether or not the pedometer was worn. The students' actual steps, as recorded by the pedometers, were complemented with nonambulatory activity step equivalents. These steps were estimated from activities recorded in students' activity diaries. Data were collected from students who wore the pedometer for a minimum of eight hours per day on at least two school days and one nonschool day to provide accurate and reliable measures of physical activity.

Results

Steps Achieved at Baseline and Follow-Up

Table 1 shows the mean number of steps achieved during a typical week of five school days and two weekend days, and on school days and weekend days at baseline and follow-up. Table 1 also shows the baseline and follow-up mean number of steps achieved during school hours and outside of school hours. Results are reported separately for intervention and control schools.

Table 1. Mean and standard deviation (SD) of steps taken among Grade 4 students at baseline and follow-up for intervention school and control school

	Intervention School Mean (SD)		Control School Mean (SD)	
	Baseline	Follow-up	Baseline	Follow-up
Typical average, steps/day	10,485 (2,902)	12,100 (4,223)	9,731 (3,387)	11,382 (3,483)
School days, steps/day	10,898 (2,889)	12,466 (3,899)	9,823 (3,760)	11,747 (3,356)
Weekend days, steps/day	9,453 (4,431)	11,183 (6,418)	9,499 (3,765)	10,472 (5,801)
Steps during school	6,768 (1,627)	7,190 (2,021)	5,780 (1,849)	6,611 (1,787)
Steps outside school	4,130 (2,062)	5,277 (2,716)	4,043 (2,209)	5,135 (2,395)

Changes in Steps Achieved from Baseline to Follow-Up

On average at follow-up in the spring, students attending both the intervention and control schools took more steps per day during a typical week and on school days. Students took more steps outside of school hours. In the spring, at follow-up, students from the intervention school also took more total steps per day on weekend days relative to their baseline measures. Additionally, at follow-up, students from the control school took more steps during school hours than they did at baseline.

Intervention Effect

The change in steps among students attending the intervention school relative to the change in steps among students attending the control school represents the intervention effect. Table 2 shows the intervention effect for steps achieved during a typical week, during school days and weekend days. Differences in steps between school hours and nonschool hours were not statistically significant.

Table 2. Effect of the intervention on step counts among Grade 4 students 9 months from baseline

	Intervention School		Control School		Intervention Effect	
	Mean Change	P-Value	Mean Change	P-Value	Mean Change	P-Value
Typical average, steps/day	1,881	<0.001	1,617	0.006	264	0.731
School days, steps/day	1,780	0.001	1,944	0.002	-164	0.838
Weekend days, steps/day	2,081	0.005	792	0.379	1,290	0.269
Steps during school	453	0.111	832	0.015	-379	0.395
Steps outside school	1,297	<0.001	1,104	0.012	193	0.736

Note: Results are adjusted for year of data collection.

Students at the control school took more steps during school hours than they did at baseline.

Hourly Steps Achieved on School Days and Weekend Days:

On school days, the hour with the largest accumulation of steps was between 12 PM and 1 PM (Figure 1). On weekend days, the hour with the largest accumulation of steps was between 4 PM and 5 PM (Figure 1).

Steps Achieved on School Days and Weekend Days

Overall, students took significantly more steps per day on school days than on weekend days (school days: 11,481 ± 3,601 steps/day; weekend days: 10,307 ± 352 steps/day; $p<0.001$).

Steps Achieved During School and Outside School on School Days:

Overall, students took significantly more steps during school hours than before or after school hours (school hours: 6,711 ± 1,886 steps; outside school hours: 4,769 ± 2,452 steps; $p<0.001$).

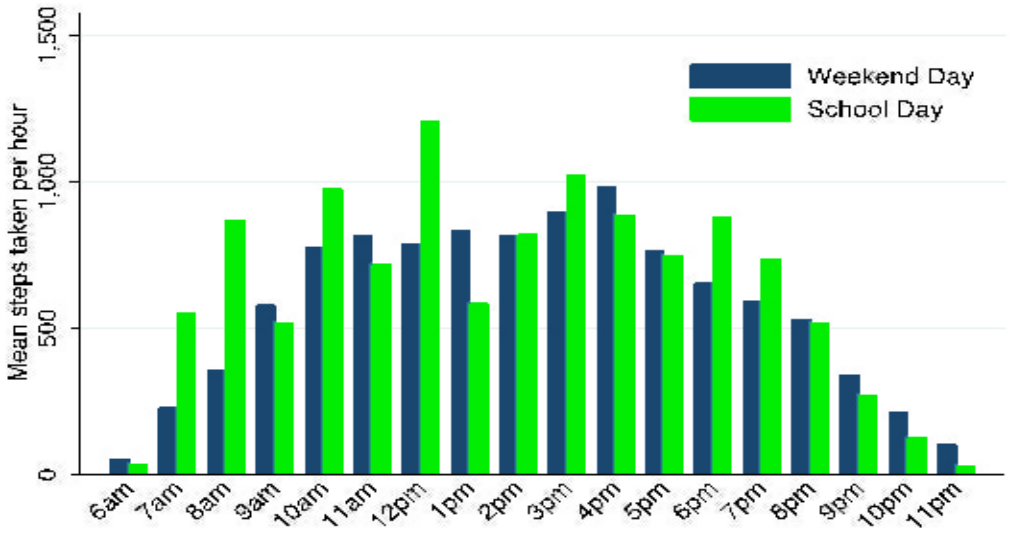
Steps Achieved Before Lunch, During Lunch, and After Lunch on School Days

In the hours from 8 AM to 12 PM, students took an average of 3,080 steps ± 974 steps. Between 12 PM and 1 PM, students took an average of 1,204 steps ± 454 steps. In the hours from 1 PM to 3 PM, students took an average of 1,404 steps ± 684 steps.

Survey

Each student in both the control and intervention school completed a 10-item survey that reflected the student's knowledge and attitudes about being physically active during physical education, physical activity, recess, in the classroom, outside of school and the wearing of the pedometer. Students had the choice to strongly agree, agree, disagree or strongly disagree with each of the 10 questions. Each year (2009–12), it was evident from the responses that students from both the intervention and the control school liked to wear pedometers more often because they liked the feedback on the numbers of steps that they completed during the week that they wore them. The majority of the students from both schools chose the question response option of either "strongly agree" or "agree" when responding to the question about their activity level when they were wearing the pedometer. Students reported and seemed to feel as though they were more active while wearing the pedometer. One of the questions asked in the survey examined whether students felt that in the classroom they did activities that got them out of their chairs to be more active. The results from this question displayed a considerably higher rate each year of "strongly agree" from the intervention

Figure 1: Mean number of hourly steps on school days and weekend days



school than from the control school. The intervention school had a higher rate of "strongly agree" or agree" when responding to the question that states "My teacher talks to us about being active outside of school." Throughout each year of the survey, students from both schools stated that they enjoy physical education.

Discussion

The current study measured the pedometer steps of Grade 4 students during school time and during leisure time on weekdays and weekend days. The purpose of the study was to determine whether the technology justifies the investment of time for professional development and curricular support for teachers and whether it will affect student activity levels during school and nonschool days.

In a typical week, students at the intervention school had higher levels of physical activity than those at the control school. The pedometer served as a motivational tool in both schools: students wanted to wear pedometers more often because they received instant feedback about their step count. The most noteworthy finding was that in the intervention school, the teachers were able to apply their learning about how to increase physical activity levels throughout the school day. Additionally, students from the intervention school were more conscious of being active in the classroom throughout the school day. Therefore, the findings do support the investment of time for the teachers at the intervention school to receive professional development to increase their knowledge of, skills in and attitudes about increasing physical activity levels of students both during school hours and nonschool hours. Additionally, the technology was demonstrated to increase student activity levels.

Previous research (Cox et al 2006; Tudor-Locke et al 2006; Vincent and Pangrazi 2002) has demonstrated that on weekdays overall step counts were considerably higher before and after school hours than during school hours. This study demonstrates that students took significantly more steps during school hours than before or after school hours. Evidence from this study suggests that future interventions may be necessary to target parental understanding about providing opportunities for their children to be physically active outside of school hours. Tudor-Locke et al (2006) had demonstrated through their research that students are typically active only during recess times and physical education. Through targeted professional development time in the intervention school, teachers commented that they felt more knowledgeable about how to support student physical activity levels in physical education classes and through a cross-curricular approach throughout the school day. The number of steps consistently increased from baseline to follow-up in all areas: typical average, school days, weekend days, during school hours and after school hours. Previous research indicates that children's physical activity is higher in summer than winter (Rowland and Hughes 2006). The step counts were collected in the late fall in a large Canadian city in western Canada, and this time of year proved to have colder temperatures than the spring data collection period. This may account for the higher numbers in the spring during both school and nonschool days.

The student survey demonstrated that the students viewed the pedometer as a motivational tool for being more physically active. The results given to the students with their step counts provided immediate feedback regarding their results over the week. The importance of immediate feedback is that it may provide students with external motivation for being physically active. For students with high step counts, it may be instant gratification, but students who might have forgotten to wear their pedometer on certain days might find the feedback disappointing.

Conclusion

The data collected in this study strongly supports the connection between the technology and the time for teachers to build on their pedagogical practices in the classroom and gymnasium to increase student knowledge, skills and attitudes about the importance of physical activity for all students. It is strongly evident that teachers need to be supported in their teaching so that students can learn the importance of being physically active throughout each day. Given continual changes in curriculum and available resources and technologies, a teacher must create an environment that places importance on being physically active for a lifetime.

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After-School Programming That Provides the Daily Physical Activity Recommendations for Children

Nicholas M Taylor and Angela M Kolen

Why After-School Physical Activity Programs?

Over the past few decades, there has been a combination of a decrease in physical activity and an increase in obesity and related comorbidities among Canadians, including children and youth. Therefore, the Canadian Physical Activity Guidelines for Children (5–11 years) and Youth (12–17 years) recommend that boys and girls should accumulate at least 60 minutes of moderate or more intense physical activity per day for optimal growth, maturation and development, and for extensive physical and mental health benefits (Canadian Society for Exercise Physiology nd). Although the recommendations are for seven days a week, a national survey that used objective measures to collect data regarding physical activity found that that only 9 per cent of Canadian children and youth meet these recommendations on just six days of the week (Colley et al 2011).

Given the structure of the teaching and learning environments in Canadian schools, most of the time children are in school they are sedentary, with little time specifically allocated for physical activity. Physical education, recess and lunchtime provide some opportunities for physical activity. However, these opportunities are insufficient in terms of overall time and intensity for children to meet the previously stated physical activity recommendations. For example, one study reported that boys and girls in Grade 3 spent less than 5 minutes in moderate or more intense physical activity during their 15-minute recess (Kolen-Thompson et al 2013), and another study reported that in an average physical education class, children spent only 8.6 per cent of their time in moderate or more intense physical activity (Simons-Morton et al 1993). Although physical education provides an excellent opportunity for movement, it is important to keep in mind that it is a mandatory subject with curriculum objectives to develop motor skills and coordination, and even with the most efficient and effective teachers, about 50 per cent of the time is spent in lighter-intensity physical activities. Thus, it is clear that a 60-minute physical education class is not equivalent to 60 minutes of moderate or more intense physical activity and that children and youth need other opportunities to be physically active to meet the minimal Canadian physical activity recommendations. The time period immediately after school is recognized as an ideal time to provide children with opportunities for physical activity (Active Healthy Kids Canada 2014). As previously mentioned, only 9 per cent of Canadian children meet the minimal recommended level of physical activity, but a much higher percentage (53 per cent of boys and 35 per cent of girls) obtain at least 60 minutes of moderate or more intense physical activity on at least three days of the week (Colley et al 2011). One can infer from these findings that the minimal physical activity recommendations could be met, then, by providing opportunities for children to increase their physical activity on a few more days of the week. The after-school time period may be an ideal time to do so—76 per cent of 5- to 19-year-olds in Canada are currently participating in unorganized physical activities during this time (Canadian Fitness and Lifestyle Research Institute 2013).

One program that may provide the much-needed opportunity to be physically active for children is Fit 4 Life, a physical activity program offered three days per week after school for boys and girls in Grades 3, 4 and 5 at St Francis Xavier University, Antigonish, Nova Scotia. Children who participate in this program are walked from their school to the university, where low-organized games and activities

designed for maximum participation and high levels of engagement are played. Previous research showed that participating in this type of program was effective in reducing body fat and increasing cardiorespiratory fitness, muscular strength and endurance in the elementary school participants (Moylan, Faloon and Thompson 2007). Although this earlier research indicated an increase in the health-related parameters of physical fitness in the elementary school participants, there has been no objective measurement of the participants' physical activity. Thus, the purpose of this study was to determine the amount and intensity of physical activity that children obtained while taking part in the Fit 4 Life after-school program.

Research Procedures

Participants

Parents/guardians of the boys and girls in the Fit 4 Life program were invited to provide written informed consent for their child to participate in this study. A convenience sampling method was used, with all children whose parents/guardians provided consent included. The children were 8 to 12 years old, in Grades 3, 4 and 5, and registered for one, two or three days of the program each week for 10 weeks. The children themselves were asked to provide oral assent for their participation in the study each day prior to the placement of the accelerometers used in the study. Research ethics approval for this study was obtained from the St Francis Xavier University Research Ethics Board.

Fit 4 Life Program

As previously mentioned, Fit 4 Life is an afterschool physical activity program offered to children in elementary school on Tuesdays, Wednesdays and Thursdays for 10 weeks in the fall and winter. Data collected for this study were obtained during the winter term, specifically in the last week of January and first week of February. At least 30 children participated in the program each day, with individual registration varying from one to three days per week, based upon parental preference and convenience. There were also at least 10 university student-volunteers who assisted with the delivery of the program; the participant–leader ratio was 3:1. The elementary school students were picked up from their school and walked 20 to 25 minutes at a relatively brisk pace to the university, where the program operates. Upon arrival, the participants and leaders engaged in about 10 to 15 minutes of free play using scooters, balls, skipping ropes, hoops and other available equipment. Participants then washed their hands and ate a small snack of fresh fruit or vegetables. Following snack, the leaders took turns teaching low-organized games or activities. The games and activities chosen included those that required little instruction, were inclusive and high energy, and did not involve high levels of skill or motor proficiency. At least five or six different games and activities were taught during these 60 to 65 minutes to maintain high levels of enthusiasm and participation. The session usually ended with a lighter activity that involved stretching and cooperative efforts. On each day of the program, the leaders encouraged high levels of participation from the elementary school students, in addition to being active participants themselves.

Protocol

Actigraph GT3X triaxial accelerometers were used to objectively quantify the physical activity of the participants. This accelerometer measures acceleration or movement in the three anatomical axes: vertical, anterioposterior and mediolateral. Given that the 60-second epoch, or time period, has been demonstrated to provide an accurate representation of physical activity and is commonly used to quantify physical activity in children and adolescents (Hislop, Bulley and Mercer 2012; Meyer et al 2015), it was also used in this study. The acceleration data were then digitized, and further processed to obtain an activity count for each 60 seconds. The activity counts were then categorized into one of five intensities where 1–100 = sedentary, 101–905 = light, 906–3,520 = moderate, 3,521–6,129 = hard and 6,130 or greater = very hard (Freedson, Pober and Janz 2010).

Accelerometer data were collected on six consecutive Fit 4 Life days (ie, Tuesday, Wednesday, Thursday, Tuesday, Wednesday, Thursday) from all participating children. As per convention, an accelerometer was placed over each participant's right hip in a small

Velcro pouch attached to a belt, and worn over or under the participant's clothing (based on personal preference) (Vanhelst et al 2009). The accelerometers were put on at approximately 2:30 PM at the participants' school, prior to the 20- to 25-minute walk to the university, where the Fit 4 Life program was held. The accelerometers were taken off at the end of the program at approximately 4:30 PM, thus providing 120 minutes of data for each participant.

Data Analysis

The average minutes of physical activity intensity (light, moderate, hard, very hard) per day were calculated for each participant, taking into account the number of days the accelerometer was worn. Descriptive statistics (mean ± SD, range) were then calculated from these data. Comparisons were made between the boys and girls using independent *t*-tests with significance set at $p \leq 0.05$.

Findings

Twenty-nine children (16 boys and 13 girls) in Grades 3, 4 and 5 participated in this study. Table 1 shows the number of participants from whom data were collected for each of the six days. Each participant wore his or her accelerometer between one and six days, as presented in Table 2. On average, the girls provided 3.0 days of data and the boys 3.4 days. Only 4 children provided data on each data collection day.

Table 1: The number of participants that provided accelerometer data for each Fit 4 Life session of data collection

Day	Possible Sample	Total	Boys	Girls
1. Tuesday	30	16	8	8
2. Wednesday	30	16	7	9
3. Thursday	30	15	9	6
4. Tuesday	30	16	10	6
5. Wednesday	30	17	7	10
6. Thursday	30	18	13	5

Table 2: The number of Fit 4 Life sessions of accelerometer data provided by the participants

Number of Session	Total	Boys	Girls
1	6	4	2
2	3	1	2
3	6	3	3
4	6	3	3
5	4	3	1
6	4	2	2

One accelerometer malfunctioned and three were not worn for the full two hours; these data were not included in the final analyses. Thus, in total, 95 Fit 4 Life sessions of data were used in the final analyses.

The data presented in Table 3 shows the average time spent in moderate-, hard- and very hard-intensity physical activity for the total sample and for the boys and girls separately. On average, 87.7 ± 8.8 minutes, or 73.1 per cent of the total program time, was spent in physical activities of moderate or greater intensity. There were no significant differences ($p = 0.415$; $t(27) = 0.829$) between the boys (89.3 ± 11.2 min) and girls (85.6 ± 11.1) in the average minutes of moderate or more intense physical activity obtained.

What Do These Results Mean?

The purpose of this study was to determine the amount and intensity of physical activity children obtained while participating in an after-school program called Fit 4 Life. Results indicated that the elementary school participants were engaged in moderate or more intense physical activity for approximately three-quarters of the 120-minute program, or almost 90 minutes. This level of participation was sufficient for the children to meet their physical activity recommendations for the days they were involved in Fit 4 Life. Thus, the results of this study clearly indicate that the Fit 4 Life program not only effectively motivates children to move, it also keeps them moving at intensities that allow them to meet the recommended level of physical activity participation.

Table 3: Minutes (X ± SD) of moderate, hard, very hard, and moderate and more intense physical activity for the participants during the two-hour Fit 4 Life after-school program

	Moderate (min)	Hard (min)	Very Hard (min)	Moderate and More Intense (min)
Total Sample (n = 29)	68.5 ± 6.7	17.3 ± 7.4	1.8 ± 1.9	87.7 ± 8.8
Boys (n = 16)	68.3 ± 10.4	19.0 ± 9.1	2.0 ± 3.5	89.3 ± 11.2
Girls (n = 13)	66.6 ± 8.6	17.0 ± 8.6	2.0 ± 2.7	85.6 ± 11.1

The participants' accumulation of more than the recommended 60 minutes of moderate or more intense physical activity during their participation in the Fit 4 Life program was not due to chance but attributable to the program and how it is delivered. Low-organized games and activities such as tag or other chasing and fleeing games, four-corner soccer, football-basketball, relays and obstacle courses provided considerable opportunity for inclusive and relatively continuous participation at a moderate or greater intensity. Further, the low participant-to-instructor ratio provided considerable motivation and encouragement for participation. Depending on the game or activity played and the participant, the physical activity intensity was most frequently moderate (57.1 per cent of total time) with shorter bursts of hard- (14.5 per cent) and even fewer bursts of very hard-intensity (1.5 per cent) physical activity. This low level of very hard-intensity physical activity is consistent with Canadian (Colley et al 2011) and Nova Scotian data (Thompson and Wadsworth 2012). Since the philosophy of the Fit 4 Life program is to maximize participant involvement and encourage high levels of physical activity participation, it was likely that the light-intensity physical activity (8.7 ± 2.8 min; 7.3 per cent of total time) comes from the short breaks between the games/activities played when the next activity/game was explained. The finding of no significant differences between the amount and intensity of boys' and girls' physical activity participation in the Fit 4 Life program is not surprising and supports research that shows that discrepancies between the sexes' physical activity levels do not appear until about Grade 7 (Thompson and Wadsworth 2012; Tremblay et al 2011). This lack of significant difference in amount and intensity of physical activity accumulated during the Fit 4 Life program may also indicate that boys and girls were equally motivated and encouraged to participate fully.

A provincial surveillance study of the physical activity of children and youth in Nova Scotia noted that between the hours of 3 and 6 PM, or the after-school time period, boys and girls in Grade 3, on average, obtained 38.6 ± 1.37 and 38.7 ± 1.13 minutes of moderate or more-intense physical activity respectively (Thompson and Wadsworth 2012). Based on these results alone, it can be inferred that participation in the Fit 4 Life program (or other similarly run programs) more than doubles the amount of physical activity children obtain in the after-school time period, particularly when one keeps in mind that this program was only two hours long and not three, the length of time reported on by Thompson and Wadsworth. Further, the results of this study suggest that the after-school time period can be effectively used to promote physical activity in children and might imply that increased funding, awareness and opportunities for these types of programs could be beneficial not only for obtaining the Canadian recommendations for physical activity, but also for the reported benefits for children's physical and mental health in both the short and long term.

This was the first study to objectively measure the physical activity levels of children in the Fit 4 Life program. Accelerometers are often considered the "gold standard" for measuring physical activity levels; therefore, the most notable strength of this research is the fact that results were obtained using a state-of-the-art measurement tool. While past attempts at quantifying children's physical activity have been limited to self-reporting or even subjective observation, the use of triaxial accelerometers provides objective, quantitative affirmation of their participation.

In conclusion, elementary school children who participated in the Fit 4 Life program for two hours after school were able to effectively meet their physical activity recommendations for that day. As such, Fit 4 Life provides an impressive template on which to base other after-school physical activity programs aimed at providing children with an opportunity to increase their participation in physical activity. Although the number and variety of games/activities played led to high levels of involvement, it is clear that the management and design of this program were equally important in providing sufficient and effective opportunities for children to be physically active: short, quick instructions were delivered between games/activities, and the program deliverers were highly encouraging and supportive in addition to participating in the program themselves. It is also important to keep boys and girls grouped together at this age or grade level and in programs such as Fit 4 Life, which provide gender-unbiased opportunity for physical activity, since boys and girls achieved equally high levels of participation.

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Perceptions of Multiplayer Exergames Within PE: A Mixed Method Study

Brett Barron and David Chorney

Introduction

Playing video games is a popular free-time activity among adolescents and an influential medium within youth culture (Nippold, Duthie and Larson 2005; Sweeny 2010). While this is traditionally seen as yet another contributor to the sedentary lifestyles of youth, some scholars have found reason to investigate the curricular implications of this ever-evolving technology, particularly with respect to physical education (PE) (Yang, Smith and Graham 2008). Recently, a new wave of gaming known as *active gaming* or *exergaming* is showing that it can be an educationally functional and enjoyable method of learning for participants who find a traditional PE setting unappealing (Papastergiou 2009). Sheehan and Katz (2010) describe exergames as "videogames with an interface that requires active involvement and exertion of physical force by participants" (p 13). Exergames go beyond the simple finger movements of conventional videogames by requiring the participants to engage a virtual space with their entire body (Mears and Hansen 2009).

Since then, many quantitative studies have concluded that dance and rhythm exergames (D&RE), such as Konmai's Dance Dance Revolution and Ubisoft's Just Dance, consistently raise the heart rate of participants to a moderate or vigorous level (depending on duration and style of game play), thus improving the participants' overall health and fitness (Foley and Maddison 2010; Murphy et al 2009). However, little is known about the impact these devices would have within a school setting. The intent of this concurrent mixed methods study was to explore students' experiences while using a D&RE and decide whether or not these devices are suitable for use within a PE classroom.

Method

In this study, Konami's Dance Dance Revolution Classroom Edition (DDRCE), made up of 48 wireless dance mats and a computer tower, was rotated among six schools within an urban school district in Alberta. A post survey was used to determine students' attitudes toward PE after using the device for approximately three weeks. Concurrently, the usefulness of D&REs within a school setting was explored, using two separate group interviews of six students from two different schools.

Participating Schools

It may be argued that in the early developmental years of life there is no school subject that has more appeal to elementary-aged children than PE. However, all too often, students lose the motivation to take part in a traditional PE class, and their attitude toward the subject becomes negative and uncomplimentary (Deacon 2001). Typically, somewhere between the ages of 8 and 15 students lose the motivation to participate in PE; for this reason, the study included only elementary and junior high schools. Next, participating sites also needed an area to securely store the device—the DDRCE is a bulky piece of equipment and required additional storage over and above what already existed within a school. Also, due to the responsibilities associated with the care and maintenance of the equipment, only schools that were interested in the project and had the ability to provide a lead teacher to oversee the data collection procedures pertaining to the research were considered.

Responsibilities of Lead Teachers

All lead teachers were given a complete breakdown of each of the DDRCE's components, as well as an

opportunity to learn the functions and commands of the device. A schedule was also established so each school had the device for approximately three weeks, during which the multiplayer D&RE was to be used by the entire student body during regularly scheduled PE classes. The DDRCE system would be set up in the morning before classes started, then taken down and charged overnight.

Data Collection

Survey Protocol

After students had used the D&RE for approximately three weeks, lead teachers administered a post survey based on the enjoyment levels, attitude and participation of students in PE while using the device. Although the entire student body used the D&RE while it was housed at their school site, the only students surveyed were the ones in the lead teacher's homeroom (approximately 25 students per site).

Group Interview Protocol

The research project included three elementary schools and three junior high schools; one school from each age cohort was selected at random to provide three students who would take part in the group interview. Hence, a total of two group interviews took place, one to represent each of the age demographics within this study.

Students who received the surveys and indicated they were interested in taking part in the interview portion of the study became eligible participants. Suitable group interview participants were chosen based on their ability to demonstrate a competent understanding of the English language and their ability to proficiently articulate thoughts and feelings. Due to the unique position of the lead teachers at each individual school site and the in-depth understanding of potential participants, it was the lead teacher's responsibility to select three participants to take part in the interview. Additionally, the individuals within the group interview consisted of students from the same classroom, which helped establish a comfort level during the group interview.

Results

Survey questions were all based on a five-point Likert-type scale in which circling a one indicated that the participant never agreed with the statement offered in the survey, circling a three indicated that the participant sometimes agreed with the statement, and circling a five meant that he or she always agreed with the statement.

Table 1. Survey Responses of All Participants

	Mean	SD	N
How often did you play D&REs before they were introduced to your school?	2.88	1.152	121
How often did you enjoy PE while using the D&RE?	4.26	.911	121
Did you look forward to using the D&RE in PE?	4.22	.953	121
How often did you participate in PE when the D&RE was in use?	4.52	.788	120
Were you motivated to use the D&RE?	4.15	.950	120
Did you feel safe when using the D&RE in PE?	4.55	.796	121
Did you have a positive attitude toward PE while using the D&RE?	4.41	.833	121
How often would you like to see a D&RE as a part of your PE class?	4.03	1.032	121

Note. Survey results based on a five-point Likert-type scale. SD = standard deviation; N = number of responses; D&RE = dance and rhythm exergames. 1=Never; 3=Sometimes; 5=Always.

Overall, students who came into contact with DDRCE approved of the device and its insertion into regularly scheduled PE class. Mean scores based on enjoyment, motivation and attitude toward PE all stayed above a 4.0 on the five-point Likert-type scale (see Table 1). The lowest mean score among all participants surveyed was the amount of D&RE experience an individual had before using it in the PE classroom (mean = 2.88); at this juncture it is unclear whether that is a result of being uninterested in the exergaming devices or not having the opportunity to use a similar exergame at home or elsewhere. Yet, with a mean score sitting right above the halfway mark of the five-point Likert-type scale coupled with the highest standard deviation, it is clear that, much like any other activity or game introduced in a PE setting, there is a large discrepancy between the experience levels of the participants.

When students were asked how often they participated in PE while the multiplayer exergame was in use, the category yielded the lowest standard deviation (SD = 0.788) and the second-highest mean score (mean = 4.52). These results are clear evidence that students were consistently able to engage the exergame in a PE setting. However, when this result is compared to enjoyment (mean = 4.26) and/or motivation (mean = 4.15), a slightly lower mean total is noted. Therefore, even if an individual was not highly motivated to use the exergaming equipment, more often than not he or she would still participate in PE while the device was in use.

This may partially explain the larger standard deviation when participants were asked how often they would like to see the D&RE as a part of PE class (SD = 1.032), although this question maintained a relatively high mean score (mean = 4.03), indicating that most students would like to see the multiplayer exergaming devices within their PE classes in some capacity.

Discussion

The Device

Initially, the research team debated whether the dance interface would unintentionally harm students who were unable to reach a certain level or mastery within the gameplay, or embarrass individuals who may appear awkward while using the device. However, it was finally agreed that this form of instruction would not put students at risk more than any other PE unit. Concurrently, interview participants initially reported wishing to be placed at the back of the class when doing the activity, but soon came to the conclusion that the exergaming interface limited opportunities to comment on the way others used the game, because "you just look at the screen, you're not looking at anyone else" (junior high female 1). Another participant insisted that "nobody had time to laugh at anyone 'cause they were too focused on the game" (junior high male 2). Perhaps this is also why survey responses indicated that participants felt overwhelmingly safe, either emotionally or physically, when using the D&RE in a school setting, giving it the highest mean score (mean = 4.55) when comparing responses from all participants (see Table 1). The feeling of safety coupled with high scores related to participation and motivation while the device was in use allowed for the vast majority of students to genuinely enjoy their PE class while the D&RE was in use.

Comparable to other videogame consoles, the DDRCE provided synchronous feedback for each individual dancer; hence, students were given immediate and personal feedback based on their performance and had the option of choosing at which pace to engage the game. Not only were there several difficulty levels from which each student could choose, but individual results also enabled participants to track their progress and gauge their skill improvement. The formative assessment is meaningful to students and offers further insights to the very high mean scores for students who expressed having a positive attitude toward PE while the D&RE was in use. As an individual received feedback from the exergame, he or she was able to respond by trying to improve his or her performance and attain a greater level of mastery within the game. Typically, formal and objective feedback regarding skill improvement is difficult and time consuming to deliver within a PE setting, and it is most likely left up to the student to gauge whether or not he or she has made any progress.

During D&RE sessions students tracked their score via a pseudonym assigned to their dance mat; these names would alternate among dance mats on a daily basis and, therefore, would rarely be given to the same student twice (unless that individual sought out a specific name). Hence, students were afforded a layer of anonymity, as only students who played in close proximity to each other would be able to make an immediate connection between a person and his or her gameplay pseudonym. This may have aided in the development of "friendly competition" (junior high male 2) while the exergame was in use. If students choose to use dance mats that were located among their friends or people they felt comfortable with, as indicated by the qualitative results, they would often engage in competitive behaviours to see who could attain the highest score. Concurrently, competitive spirits within the classroom would only promote higher levels of physical activity while the multiplayer D&RE was in use.

Linking Curriculum

The multiplayer exergame creates obvious links with the dance component of the program of studies, and offers the additional bonus of adding enjoyment to this particular aspect of a PE program. Due to beliefs and prejudices of both teachers and students, dance is a subject that often receives minimal attention in PE due to the importance placed on sport and other recreational activities (Vlasic, Oreb and Katovic 2012). Dance is sometimes considered an activity that is best suited for young children and females, and as a result is often deemed a bottom priority, with little attention given to the creation and delivery of the topic (Sanderson 2001). As noted in the results section, both interview cohorts had compared the use of the D&RE to traditional dance units in which they had participated in previous years. In both elementary-aged and junior high interviews, previous dance units were considered to be an activity that was boring and unsavoury. Students felt a traditional dance unit "was really awkward" (junior high male 2), or just "wasn't very fun" (elementary male 1).

Comparing a traditional PE unit with one that used a DDRCE as its main curricular instruction tool, students' attitudes seemed to move in a positive direction in support of the device. For instance, when interviewees were asked if they enjoyed using the device as part of PE one participant said, "lots—it was awesome"; another interviewee from the junior high cohort explained, "I thought it was really fun and it did add a lot to our class" (junior high male 2). Pairing these comments with the survey results, it was evident that a much more positive attitude is accredited to the D&RE intervention than to a traditional dance unit.

Whether the positive responses were due to a lack of quality planning in previous dance units, the novelty of using exergames in a PE setting or a combination of additional factors would be difficult to ascertain. However, according to both quantitative and qualitative results, students would be willing to swap out or use in conjunction with, perhaps only for a brief period of time, their current dance program and continue using the D&RE.

Conclusions

When considering the inclusion of an exergame device within a school setting there are a variety of factors that must be accounted for when making what can be a very expensive purchase. This study was performed to gain a better understanding about how students perceive a multiplayer D&RE in a PE setting and whether or not these devices are a sustainable and worthwhile investment. Overall, the use of a multiplayer D&RE in a PE setting was a safe and enjoyable experience for the majority of participants. While not every single individual thoroughly enjoyed using the DDRCE, both the qualitative and quantitative data sets echoed responses of enjoyment and a positive attitude to the use of this exergaming device. Moreover, students indicated that they would welcome a multiplayer D&RE in their PE classroom in the future. However, it is strongly recommended that schools investigate the cost of an exergaming system before purchasing anything. The device used in this study cost approximately $25,000, and of the 48 mats that were originally purchased 16 needed replacing. Although we were not charged for the replacement mats,

this could become an issue of contention between the purchaser and the company providing the equipment. Not only should purchasers deal with companies and sales representatives they feel comfortable with, but they should also familiarize themselves with the warranty of the devices they intend to purchase.

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*Uetus et Nouum**

Ten Tips to Help You Incorporate Sit-Ups into Your PE Classes

Tim Norman

The reason that the abdominal muscles are important is that they counteract the erector spinae muscles, which parallel the spine and pull the trunk upright. If the abdominal muscles are weak, the pull or continual contractions of the erector spinae group result in an exaggerated pelvic tilt. Swayback, a common term for pelvic tilt, often leads to periodic episodes of lower back problems. A program designed to strengthen the abdominal muscles and enhance their endurance can prevent and/or reduce pelvic tilt, significantly reducing lower back pain.

Abdominal Program Hints

Here are 10 helpful hints for your abdominal strengthening program:

1. Do a variety of sit-ups in the class throughout the year. Progress from easier sit-ups, such as partial curls, to more demanding sit-ups, such as the bench crunch, by the end of the year.
2. Do not use sit-ups as punishment, because this will develop a negative attitude toward abdominal exercises.
3. Do sit-ups at different times in the class—not just at the beginning in the warm-up. Do them in the middle of the class or, even better, at the end of the class as a good way to cool down and relax.
4. Sit-ups must be done slowly and rhythmically, not fast and jerky. Emphasize quality, not quantity. Use relaxed, paced music or count out slowly (for example, up in one and down in a four count).
5. Emphasize breathing out on the way up. This teaches the proper breathing habits when forcing or contracting a muscle. Don't hold your breath.
6. Build up in sets of 8, 10 and 15; three sets is the ideal, but two sets of 12 is fine for a PE class.
7. Stretch the abdominal wall after each set. For example, stretch out on the floor.
8. Use mats where possible to ease the pressure on the tailbone, making the exercises less painful and developing the idea that sit-ups need not hurt. Note that the bent-knee partial curl requires no pad and is very safe.
9. Incorporate sit-ups with other strengthening or stretching exercises—for example, 12 partial curls followed by a hamstring stretch, repeated twice. This saves time and can make sit-ups more fun, especially if there is music.
10. Last, stop if there are any sharp, sudden pains.

Tim Norman of Mecatina School, La Tabatiere, Quebec, originally wrote this article for the teachers of the Lower North Shore of Quebec in their magazine, Coasting. *It was also published in 1989 in the* Physical Education Digest *6, no 1, p 24.*

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*Latin for *old and new*

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