21st Century PE: Changing the Paradigm

with

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Imagine our profession’s future?

“If we hadn’t inherited the way we currently do physical education, how would we design it?”. This question seems to me to get to the crux of the challenge we face today at every level of professional activity: From NASPE, district, and state associations, to university PETE programs and K-12 school based physical education. If we could have a “do-over” what would physical education look like?
Objectives

- Process for thinking about and sharing our beliefs. Improved understanding of where we’ve been as a profession and introspection upon where we want to go. What is our purpose?
- How exercise/physical activity positively affect learning
- Reflect on the PETE process – what can we do better
- Strategies for 21st century assessment
- Promotion/marketing of New PE – getting students and parents to buy-in
- Aspects of building school community
Perception vs. Reality

- We know the reality ...
- But parents, school boards, administrators, colleagues all had physical education experiences
- ...and unfortunately many of them were negative
- Hollywood hasn’t done us any favors with “gym teacher” stereotypes
We’ve Changed…but

- Not everyone has changed. PETE prevalence of sport based models and contradictory philosophies
- Is it working? Are we (PE and Public Schools) making kids healthier, lifelong movers?
- If we’re doing such a good job physically educating our population, how come we have an obesity crisis in the US?
- Why is health NOT a priority to our nation?
- Why are we losing athleticism?
When did we leave the responsibility up to public education to teach our children how to live active lifestyles?
Global Perspective

- I grew up in Switzerland, and it is mandatory to be involved in soccer before school, and often on weekends go skiing in the Alps with your school mates. Kids play in the street skateboarding, going to the park to play a quick game of pull ups or dips set up as "stations" for fun fitness. We had a ropes course set up in our school playgrounds so kids built agility and stability strength early on, often we arrived to school early to play on the ropes before classes started. This is not happening in America and it's sickening to see people so inactive and having little if NO sport skills. Parents play a role in kids standards in Switzerland, my parents took us hiking each weekend in the mountains and forests. The schools should have "outlet" stations for kids to learn to play and enjoy sports but this is certainly not the case. America is falling to bits... take responsibility for your kids, as the governments and schools cannot do it for you.
Most Americans will become overweight, 90% of men and 70% of women.

An email from a German doctor who had gone to a conference in Illinois: 'One afternoon I decided to go for a walk. I noticed there were hardly any sidewalks on this road. On two occasions people stopped their car and asked if I was OK. The second stopper was a police car. The policeman found it hard to believe I was just going for a walk.'
In the U.S., we are reaping exactly what we sow.

We're fatter than ever

Preventable injuries on rise (both in competitive athletes and the general population)

No longer the international sports powerhouse we once were.

Our academic performance has also slipped considerably as compared to other countries around the world, and while there are loads of socioeconomic factors that influence this, I think it's safe to say that healthier, active kids are smarter kids.

Clearly, what we're doing isn't working.
How Did We Get Here?

- 1890’s – 1930’s development of normal schools for PETE

- This position supported the thesis that physical education contributed to the physical well-being of children, as well as to their social, emotional, and intellectual development. However, Charles McCloy argued against this expanded role of physical education, arguing that *education of the physical*, which emphasized the development of skills and the maintenance of the body, was the primary objective of physical education. The testing of motor skills was a part of McCloy's contribution to physical education, and his philosophy of testing paralleled the scientific movement in education.

- Many colleges required Physical Training for all students three periods a week during the first two years of study.
Nation in Decline?

- Throughout the early twentieth century, into the 1950s, there was a steady growth of physical education in the public schools. During the early 1920s many states passed legislation requiring physical education.

- The emphasis in physical education shifted from games and sport to physical conditioning.

- 1953 when the Kraus–Weber study found that American children were far less fit than their European counterparts.

- During the 1950’s and the 1960’s, physical education at the elementary level experienced tremendous growth.
“We are under exercised as a nation. We look instead of play. We ride instead of walk. Our existence deprives us of the minimum of physical activity essential for healthy living.”

- John F. Kennedy
1980’s & 90’s

- However, since the 1970s the number of schools offering daily physical education has drastically decreased—1995 statistics from the Centers for Disease Control and Prevention (CDC) show a drop from 43 percent in 1991 to 25 percent in 1995.

- In the 1990s three national reports—*The Surgeon General's Report on Physical Activity and Health* (1996), *Healthy People 2000* (1990), and the CDC's *Guidelines for School and Community Programs* (1997)—have focused on the deplorable physical condition of Americans. These reports cited physical inactivity as a national health risk, based on statistics such as: (1) 13 percent of young people are classified as overweight; (2) only half of all youths are physically active on a regular basis (and this percentage decreases with age); and (3) inactivity and poor diet cause at least 300,000 deaths per year.
Losing Our Priorities

(2012) In its biennial survey of high school students across the nation, the Centers for Disease Control and Prevention reported in June that nearly half said they had no physical education classes in an average week. In New York City, that number was 20.5 percent, compared with 14.4 percent a decade earlier, according to the CDC.

That echoed findings by New York City’s comptroller, in 2012, of inadequate physical education at each of the elementary schools that auditors visited. Researchers at the University of California, San Francisco, found just 20 percent of elementary schools in San Francisco’s system were meeting the state’s requirements: 20 minutes per day.
“How best to resolve this dilemma is less obvious. At this particular time, perhaps the main point that needs recognition and would move our profession forward is that change in physical education is vital and cannot be delayed. The consequences of delay and resistance are grave and foreboding.”

~ S. Jefferies from PE2020
PE 2020

- Technology
- Connecting K-12 Physical Education Programs and Community Physical Activity Programs
- Physical Education Teacher Education (PETE)
- Curriculum / Content
- High School Physical Education
Self-Assessment / Evaluate Our Profession

- What are our beliefs and philosophy regarding PE?
- How can we better serve the needs of students and society in the rapidly changing world we find ourselves in?
"The serious problems we face today cannot be solved with the same level of thinking that produced them."

~ Albert Einstein
Generally Resistant to Change

• describes practice in physical education as "generally resistant to change".
What Do We Want?

- The current NASPE standards of U.S. physical education involve:
  - Competency in motor skills and movement patterns
  - Understanding of movement concepts
  - Participates regularly in physical activity
  - Achieves and maintains health-related fitness
  - Responsible behavior in physical activity settings
  - Values physical activity

- The success key factor of any physical education program is ensuring that adequate time is devoted to physical education. Current recommendations are at least 150 minutes/week for elementary school and 225 minutes/week for middle school and high school.
Quality PE

- Quality physical education is the most effective tool for providing all children, regardless of individual differences and capabilities with skills, attitudes, values, knowledge, and understanding for lifelong participation in physical activity.
What is Quality PE?

What will it look like 5 years from now? 10 years?
Highly Qualified

Highly qualified physical education teachers possess the skills and knowledge to facilitate improved teaching practices, strengthen the quality of physical education instruction, and empower students to achieve and maintain healthy, active lifestyles”

~ NASPE (2007)

- designing and delivering the physical education program, professional development, and pre-service preparation
Goals for Positive PE

● Establish a positive, safe learning environment for all students.

● Teach a variety of physical activities that make physical education class enjoyable.

● Create maximum opportunities for students of all abilities to be successful.

● Promote student honesty, integrity and good sportsmanship.

● Guide students into becoming skillful and confident movers.
Goals for Positive PE

- Facilitate the development and maintenance of physical fitness.
- Assist students in setting and achieving personal goals.
- Provide specific, constructive feedback to help students master motor skills.
- Afford opportunities for students to succeed in cooperative and competitive situations.
- Prepare and encourage students to practice skills and be active for a lifetime
What are your barriers?

- To getting your ideal program?
- What issues can we imagine encountering in the remainder of this century?
1st Year PE Teacher Issues

- Inadequate facilities / space / equipment
- Classroom management challenges & discipline
- Meeting the needs of students in special populations
- Schedule interruptions
- Personal fatigue
- Dealing with parents
- Student assessment
PETE Reform

• Urgency of reform – Quote from Forum participant, “If PETE does not respond and change candidate preparation to reflect topics addressed today, not only will we keep creating Gym Teachers we will be standing alone watching students (K–12) move away from us.”
PETE Student Teaching

# PETE Credit Hours

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<td>Major</td>
<td>54.57</td>
<td>15.5</td>
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<td>Professional Issues</td>
<td>8.73</td>
<td>6.1</td>
<td>2 - 42</td>
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Ayers, SF, Housner, LD. (2008)
What would you tell you during student teaching?

Elementary, Middle, or High School?
Evaluation

- The long-standing “busy, happy, good” approach to supervision and evaluation is not uncommon among non-PETE supervisors and our principals and VP then providing evaluation with no PE experience.

- How can one grow, develop and learn as a professional without evaluation of practice from master PE evaluators?
PETE Standards

- Recent updates
- Physical education content
- Curricular issues
- Technology
- Cultural diversity
Curriculum

- Still debate on what to follow, use, implement
- SPARK, PECAT, PE Metrics, NASPE
- Health-related models such as sport, play, and active recreation for kids and curricular materials published by Physical Best
- Depends on situation, space, time, class size...
- In many PETE programs they offer 1 credit course in sport/activity (badminton, soccer, basketball, tennis, dancing)
Curriculum

- Teaching games for understanding
- Classifying sport skills into categories (e.g., invasion, net/wall, target, fielding/run scoring) to teach conceptual game similarities instead of providing single-sport courses is one way to manage the volume of sport skill-related courses typically provided in PETE programs
- The model most emphasized at the elementary level was the skill themes approach and the most emphasized secondary model was the sport education curricular model
Content

- What do you think? Could this be better?
- Was the content relevant to what you ended up teaching?
- Wall/Rock Climbing
- Kinetic video games (DDR, Just Dance, etc.)
- Rollerblading
- Spinning
- CrossFit
- Kickboxing
Factors that support more fitness in PE curriculum:

- Obesity crisis in America (Dietz, 2004)
- Sedentary behavior is a risk factor for diseases such as heart disease, stroke, cancer, diabetes (U.S. Department of Health and Human Services, 1996)
- Increasing health care costs associated with diseases related to inactivity (Pratt, Macera, & Wang, 2002)
- Research indicating physical education programs may lead to increased levels of physical activity in childhood that extend into adulthood (Silverman, 2005).
- Exercising in the target heart rate zone for 20+ minutes helps to prepare the brain to learn brain (cognition, executive functioning, processing speed, etc.) (Thornton, Thornton, Gilbert, Ratey, Hillman, et al.)
JOHN RATEY M.D.  
Harvard Psychiatry

• Compiled research

• Naperville Central 203 LRPE

• Clinical practice / experience

• Relationship with our Supt.

• Inspired our KMS Fitness class

• Ratey was keynote speaker at DAY ONE for NPS staff 2009
We Need to Move to Learn

Keeping Children In Their Seats

When you look at this in the evolutionary context of Heinrich’s endurance predator, it makes elegant sense:

While tracking their prey our ancestors needed to have the patience, optimism, focus & motivation to keep at it.

All these traits are influenced by serotonin, dopamine, and norepinephrine
The Prefrontal Cortex
Major Role in Executive Function

- EXERCISE particularly affects our Executive Function
  - Planning
  - Organization
  - Initiate or delay a response
  - Consequence evaluation
  - Learning from mistakes
  - Maintain the focus
  - Working Memory

- Dysfunction in these areas leads to disruption in the organization and control of behavior

http://www.driesen.com/prefrontal_cortex.htm
Average composite of 20 students' brains taking the same test

BRAIN AFTER SITTING QUIETLY

BRAIN AFTER 20 MINUTE WALK

Research/scan compliments of Dr. Chuck Hillman University of Illinois
How the Brain Changes

Research suggests exercise spurs growth in a brain structure associated with memory, possibly leading to improved function. An overview:

**BLOOD VOLUME IN THE BRAIN:** NEUTRAL  
INCREASED

**THE EVIDENCE:** When new nerve cells form in the brain, their growth is accompanied by the creation of blood vessels. Researchers found that exercise increased blood volume in the dentate gyrus (a region of the hippocampus, which is used in memory), implying new cells were forming in the area.

**Relative blood volume in the brain with exercise**

Here we rely on the coupling between neurogenesis and angiogenesis and test whether MRI measurements of cerebral blood volume (CBV) provide an imaging correlate of neurogenesis.

Eleven healthy subjects (mean age 33, ranging from 21—45 years; two males and nine females) participated in the study, completing a 3-month aerobic exercise regimen.

Cognitively, individuals performed significantly better on trial 1 learning (F 7.0, P 0.027) after exercise, with a trend toward improvement on all-trial learning (F 5.0, P 0.053) and delayed recall (F 5.0, P 0.057). There was no effect on delayed recognition (F 0.19, P 0.67) or source memory (F 0.15, P 0.25) (Fig. 4a). To test that cognitive improvement was related to exercise per se, we found that individual changes in trial 1 learning were correlated with individual changes in VO2max (0.660, P 0.037).

Fitness

Hippocampus size & Memory

- Kids who were fit and who had better memory, also had larger hippocampi
- Fitness increases neurons, connectivity - 28 fit 21 non

Nerve Cells Wiring =
The Building Block of Learning

- By increasing neurotransmitter activity, improving blood flow and producing Brain Growth Factors that I call Miracle Gro or Brain Fertilizers, exercise readies our nerve cells to bind more easily and stronger.
- Exercise does this better than any other factor we are aware of at the present time.
Exercise Improves Learning by Increasing NEUROPLASTICITY

- Increased Vascular Bed - More Oxygen & Glucose available; Easier removal of the breakdown products.

- Increased Serotonin, Dopamine, BDNF (Miracle Gro) and other nerve fertilizers that strengthen the wiring of cells together.

- IGF-1, FGF, VEGF - Body/Brain Interaction: Muscles send off these messengers which travel to and impact the brain: They potentiate the release of Neurotransmitters.
The Association between School-Based Physical Activity, including Physical Education, & Academic Performance

A CDC Report, April 2010
Losing Athleticism

- Fellow strength coach 39 year old client story ...
- Born and raised in Ukraine (Soviet Union)
- “It was in our school curriculum. I've been able to do it since I was little.”
- learning to move like this was an integral lesson in each day of school
“Very few American kids are exposed to the rich proprioceptive environments that not only makes them good athletes, but also sets them up for a lifetime of good movement.”

~ Eric Cressey
Losing Athleticism

- Now, compare that to the current model for "physical education" or "athletic development" in the United States. Fewer and fewer kids have physical education classes in school, and many programs still have sport skill based model rather than athleticism and we have earlier and earlier sports specialization taking place.

- Rather than throwing, catching, striking, etc... emphasis

- More multi-joint, multi-planar, compound movements

- Kids are already getting sport skill at team sports
Fitness Testing

- How’s it working for you?
- Students? Staff? Admin? Parents?
- PACER / One – Mile
- Push-ups
- Sit and Reach for flexibility
- Curl-ups for muscular endurance
- Body Composition
New Model?

- Only 1–2% of PE teachers indicated that their PETE programs offered certification in physical best, strength and conditioning, personal training, or aerobics. PETE (programs) need to consider the new role of physical educators in contemporary K–12 programs when selecting health–related and lifetime activity components for their curricula.
21st Century Screening

Baseline

1. Squatting
2. Stepping
3. Lunging
4. Reaching
5. Leg raising
6. Push-up
7. Rotary stability
SPAR-Q

- Potential to use athletic performance testing for healthy conditioned populations
- Vertical jump
- Single leg hop to jump (injury predictor)
- 5 – 10 – 5 agility
- L.E.F.T. test
- MB toss
Technology

- HOW DO WE USE IT TO IMPLEMENT CURRICULUM?
- LCD Projector, SmartBoard, White board paint on wall
- Sound system – mobile microphone – voice activated
- Courts are lined using projection (can be changed instantaneous)
- Automatic equipment set up (rotates out of the walls; use robots)
- Video movement analysis systems and use of still cameras. (DartFish)
- SmartPhone, tablet, PDA for Teacher (automatic attendance)
- Sensors in equipment for analysis
- Floor and equipment collects energy and is fed back into the electricity grid
Technology

- Develop an Action Plan for K-12 Physical Education. Sample topics to address include:
  - Develop a position statement on Exergaming Labs and their role in promoting PA
  - Physical activity monitoring (GPS, HRM, Pedometer, Accelerometer)
  - Biometric activated fitness schedule
  - Physiology monitoring (Blood Pressure, Body Composition Analyzer, Lipids, Blood Sugar, Hydration, Brain Data, Exertion) working with medical community
  - Calorie Intake (monitoring sensors)
  - Virtual Reality (virtual immersion; virtual field trips, virtual snowboard, virtual rock climb, virtual surfing, and others)
  - Hologram demonstrations of motor skills.
- Use of social networking
Promotion Ideas

- Need to publicize model physical education programs so that it’s clear what effective physical education looks like.

- Use technology to create online tours of exemplary physical education practices.
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STAY CALM and EXERCISE

- I’ve shared with you...
- Brain science and the positive role exercise plays in helping prepare students to learn
- PA in school/classroom
- Community involvement ideas
- Nothing is perfect
- *Stay positive and do what you believe is good for students, change takes time
Thank You!

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