Conceptualizing and Teaching Content Knowledge in Physical Education

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Our research goals:

Helping teachers to teach better, and teacher educators to train future teachers.
Today’s agenda

• Introduction to concepts, principles and scope of the problem.

• Introduction to the teaching tools
  • The Content Map
  • The Knowledge Packet

• Using Content Maps and Knowledge Packets in teaching & teacher education.
An introductory task…
WORKBOOK TASK 1

1. Describe the technique of the sit up.
2. List a sequence to learn the sit up starting with a simple abdominal exercise like chin to chest and finishing with a rather challenging one like an inclined sit up with your head below your feet!
3. Which task progressions would you exclude if you were teaching 8th graders who were quite fit?
4. Which task progressions would you exclude if you were teaching 1st graders who may not have performed a sit up before?
What kinds of knowledge did you just use?

Content Knowledge (CK)

Common Content Knowledge (CCK)

Specialized Content Knowledge (SCK)

Ball, Thames & Phelps (2008)
Rules & Etiquette

Technique & Tactics

Error Detection

Tasks & Representations

CCK

SCK
The technique of the sit up!

Think about the sequence of task progressions for the teaching the sit up!

Which task progressions would you exclude if you were teaching 8th graders?

Which task progressions would you exclude if you were teaching 1st graders who little experience
The technique of the sit up!

Think about the sequence of task progressions for the teaching the sit up!

Which task progressions would you exclude if you were teaching 8th graders?

Which task progressions would you exclude if you were teaching 1st graders who little experience

Common Content Knowledge (CCK)
Specialized Content Knowledge (SCK)
Pedagogical Content Knowledge (PCK)
Pedagogical Content Knowledge (PCK) Informed by:

CCK
Knowledge of the technique of the lay-up

SCK
Knowledge of 7 extension tasks to teach the lay-up

PCK
Choosing 3 extension tasks that match the learners you are teaching

Grossman (1990)
Pedagogical Content Knowledge

Is context specific
- Teaching beginners gymnastics in a well equipped gymnasium versus teaching them in a less equipped gymnasium

Is content specific
- Teaching tennis versus teaching soccer

Is developmentally specific
- Teaching middle school youth to pitch versus teaching children in grade one to throw

Is child specific
- What works for one child may not work for another
Pedagogical Content Knowledge

• **Representations of content** (e.g., demonstrations, instructions, concepts) that teachers provide to students

• **Instructional tasks** (e.g., What the teacher asks students to do).
Viewing the PCK as a series of inter and intra lesson tasks
Lie on your back on the floor, bend your knees 90 degrees, and plant your feet flat. Tuck your chin slightly toward your chest...
Common Content Knowledge

- Tossing up to the best hitting point,
- Changing the swing for spin, slice, and flan serve, using a snap of the wrist

Specialized Content Knowledge

1. Throw overhand a ball as far as possible
2. Self-toss
3. Hit a ball by starting from L-shape arm
4. Keep left arm as long as possible
5. Going back to the base line
6. Work on hitting point and left-arm
7. Emphasize bending knees before hitting a ball
8. Aim at different targets

Pedagogical Content Knowledge

Never served

Basic Serve
The Forward Roll

Common Content Knowledge

• Hands close to feet,
• Chin tucked
• Stay in a ball
• Roll like a ball

Specialized Content Knowledge

Pedagogical Content Knowledge

Kindergarten /first grade

Kindergarten /first grade

2-4th grade

2-4th grade
Common Content Knowledge

B.E.E.F.’
Balance, Elbow, Eyes, and Follow through …

Specialized Content Knowledge

Imagine a wall don’t hit the wall.
Lie on back self toss

“Hand in the cookie Jar”
Walk through, add dribble

Problem

Elbow out to the side in shot
Poor follow-through
Wrong arm for Non dominant hand lay-up
How Big a Problem is Poor Content Knowledge?
Health-related fitness knowledge among in-service teachers (n = 23), preservice teachers (n = 54), and graduate students (n = 21) in physical education and exercise physiology.

Both in-service and pre-service teachers scored poorly on the 40-item knowledge test with mean scores below 66%.
Castelli and Williams (2007)

Studied 73 middle school physical education teachers who reported being very confident in their knowledge of health-related fitness.

62% of the teachers did not meet the standards expected of ninth grade students.
Disch, Santiago, and Morales (2012)

• 40-item health-related fitness knowledge instrument.
• Pre-service (n=89) and in-service (n=61) teachers
• Scores of 54.8% and 57.5% respectively
Soccer Knowledge Comparison

Stuhr 2009
Basketball Knowledge Comparison

Stuhr (2009) 116 Physical Education Teachers. 24 item MC test
How Well Do Teacher Education Programs teach Content Knowledge?
All Teacher Education Programs in the State of Ohio and South Korea

- All universities in South Korea with a PE program (N = 28).
- All universities in Ohio with a PE program (N = 24)
- Examined course content using syllabi
- Predominate focus in both settings:
  - Mostly CCK, little SCK
  - Korean universities (17 CCK courses) much more CCK than Ohio universities (1-7 CCK courses)

(Ward, Li, Kim & Lee, 2012)
A Sample of 26 US. PETE programs Date from Syllabi. 2 per institution

Our Study Locations

USA  WALES  ENGLAND  BELGIUM  TURKEY  CHINA

Ward, Ince Iserbyt, Kim, Lee, Li,, & Lui (2013)
Li, Ward, Sutherland, Foster, Cho (2012)
Can Content Knowledge be Improved?
Teaching teachers SCK, to impact PCK
Basketball Group Comparison

Basketball Level 2 Knowledge Questions

Stuhr 2009
Iserbyt, Ward, & Li, (in Press).
Sinelnikov, Kim, Ward, Curtner-Smith, & Li, (2015)
Ward, Kim, Ko, & Li (2015)
Tools to Teach Content Knowledge?

- The Content Map
- The Knowledge packet
WORKBOOK

TASK # 2

Design an instructional sequence
Follow up task

How you would connect that task sequence to another task sequence?
Tool # 1 The Content Map

A content map is a diagram that describes the SCK to be taught and its relationship to other SCK. It’s a blueprint of what might be called a scope and sequence but is different in the way it shows relationships.
Relational knowledge involves a teacher’s use of a set of fundamental principles to organize the content.

In your groups could you talk about when you would begin to combine or integrate the skills and tactics for the skills of your subject area.
Volleyball Sequences

Relational development

Sequential development

2v2 Captain’s Toss Pass/Set and Return Game

Partner Toss/Pass/Set/Catch (add movement to toss)

2v2 Pass Only Game

Partner Toss/Pass/Catch with Movement (toss long/short & increase distance)

Partner Toss/Pass/Catch (increase number of passes)

Self-Toss

Shadow

2v2 Set Only Game

Partner Toss/Set/Catch with Movement (toss long/short & increase distance)

Partner Toss/Set/Catch (increase number of sets)

Self-Toss

Shadow
3v3 Cone Serve Game (catch allowed)

3v3 Captain's Toss over Pass/Set and Return Game (catch allowed)

Triangle Toss over Set/Pass/Return and Catch with Movement

Triangle Toss/Pass/Set/Catch (add movement)

Line Serves (underhand or overhead)

Cone Serves (underhand or overhead)

Wall Serves (underhand or overhead)

Figure 2. 4th grade volleyball content map
Figure 4. Elementary volleyball content map
Content Maps

Workbook examples: not by grade, but by ability
Using Content Maps to Assess Knowledge

Workbook Examples
1. Written critical element tests – PT’s provide the cues and an explanation of the cues.

2. PT’s verbally present the CE’s of some of the skills. PT’s need to know all of the CE’s of the skills, but are asked to explain a randomly selected set.

3. There is a performance aspect where PT’s are observed playing the game and they are assessed on how well they perform the CE’s of skills (see Rubric).

4. The traditional sport information is covered in the weekly on-line quizzes that cover the material in the textbook (Human Kinetics Steps to Success series).
Some Elements of Deep Understanding

- Specialized Content Knowledge (SCK)
- Relational nature of the SCK
- Use of SCK for error correction
The Problem:
How to help PT’s acquire knowledge?
Tool #2
We Use Knowledge packets
Knowledge Packets

- Features of KP’s
- Who creates them?
- How to use them
Contact information and resources are in your packet.

We would also appreciate any feedback you have either in person or via email.