PART II

Curriculum theory and development

Introduction

Why does anyone need to learn about curriculum? Everyone knows what a curriculum is; after all we have all been to school, some of us for many years. We have all experienced a curriculum so we might say we know curriculum, if not intimately, certainly experientially. Interestingly, curriculum is one of those topics that the more you know, the more you don’t know and the more you need to know to begin to have a comprehensive understanding of schools. As a curriculum specialist, myself, I would assert arguably that curriculum is the center of the educational universe! Because educational programs reflect the values and beliefs of the curriculum developers and the societies in which they live, they are the generators for all other pedagogical process associated with content, teachers, students, teaching, and assessment – to name only a few.

As you get to know curriculum better, you find that there are explicit ties or relationships between and among each of its pedagogical “parts” explicitly and implicitly embedded in a curriculum. Curriculum developers must blend their beliefs and values with an understanding of content to answer key curriculum questions, such as “What knowledge and skills are of most value to my students in this school setting?” and “Why will this unit or lesson be meaningful to my students (that is, all of my students, not just the ones ‘like me’)?” Answers to these questions also require curriculum developers to understand the historical, cultural, political, and economic situations or contexts in which the curriculum will be implemented, who will implement and who will experience it. In many instances, although not all, it is probably easier to experience a curriculum than design one; one that is relevant and meaningful for these students within this very complex educational situation.

In this Handbook, the Curriculum Theory and Development part consists of six chapters that reflect both curriculum development – or how content and teaching are planfully integrated to form a coherent unit – and curriculum theory – the theoretical frameworks that bind together the working parts of a curriculum. While curriculum development is often quite concrete and focused on pedagogical information, curriculum theory is often more abstract. Developers work on the nuts and bolts of curriculum content or scope such as the topics to be taught in units and lessons. Developers also are responsible for deciding the order in which the content topics will be presented, described traditionally as sequence. Curriculum theorists define critical
elements in the educational process and how they are linked or related to form a coherent plan of study that students will perceive as relevant and meaningful. At times, the theory precedes the development, but usually teachers work iteratively … back and forth between the theoretical plan and actual student experiences to find just the “right” way to present a topic, invite and encourage student engagement with meaningful tasks, and find authentic and appropriate ways for students to learn and demonstrate their understandings.

In the first chapter (3) in this part, Donetta J. Cothran provides a primer of curriculum development, defining and explaining the curriculum process and how it often works in schools in the United States. She examines the complexity involved in defining traditional curriculum terms and process, the steps involved in curriculum planning, the role of standards in the curriculum process, and the challenges of authentic curricular assessment. Cothran critiques the traditional curriculum design process in the US that has been strongly influenced by the Tyler Rationale. Although incremental and logical, it does not actually reflect the dynamic processes teachers use in contemporary design. She continues to explain a more authentic contemporary, standards-based “backward” design model, Understanding by Design.

Ash Casey’s chapter (4) on models-based practice provides an important perspective on theory-based curriculum development. Casey provides an in-depth analysis of ways that “big ideas,” described as curriculum themes, can be used as theoretical frameworks to design models. Physical education curriculum models typically have a limited focus on one in-depth physical education content area, such as games, fitness and physical activity, or social justice, to name just a few. Casey problematizes the current implications, issues, and constraints of models-based practice and suggests the need to both understand the longitudinal impact of a model on practice and conduct research to examine multiple model implementation. He concludes by suggesting that future research should clarify the place of curriculum models in our physical education teacher education and school programs.

While Casey’s chapter focuses on curriculum models, the next two chapters by Peter Hastie and Isabel Mesquita (5) and Malcolm Thorburn (6) provide descriptions and critiques of two “families” of curriculum models currently influencing physical education worldwide. Hastie and Mesquita’s chapter delves deeply into the origins, philosophy, essence, and research associated with Sport Education as well as a number of other games-based approaches, such as Teaching Games for Understanding. Looking critically at “gaps” in games-based research, they suggest future designs and topics ripe for exploration. Thorburn, in turn, focuses on model-based approaches to fitness and physical activity curriculum. He analyzes the policy context in which these models have gained prominence and argues that a strength-based approach to fitness and physical activity emphasizing personal growth would best serve the longer term interests of physical education learners.

The part concludes with two chapters that explore contemporary theories that can help to explain curriculum complexity and constructs impacting implementation. In Chapter 7, Alan Ovens and Joy Butler describe the physical education curriculum implementation process from a complexity theory perspective. They begin with explanations of the terms and processes thought to work within dynamic, complex systems and conclude with three case studies that ground and illustrate complexity thinking in concrete and current practices of physical educators. Mauerberg-deCastro (Chapter 14) later will discuss complexity theory as dynamic systems theory instrumental in adapted physical education practices for students with disabilities.

In the final chapter (8) in this part, I look at the impact of context and the global political process to begin a discussion of curriculum within a globalized world. The world can be a perilous place where neoliberal political policies of privatization, accountability, and resource redistribution can hijack democratic curriculum discourse under the auspices of globalization.
Despite cautions, I argue that as scholars and teachers we have much to learn from each other in a globalized world. I conclude by elaborating the role of external funding to design, scale, and implement themes in globalized curriculum, providing examples using the themes of fair play, culturally sustaining and revitalizing dance curricula, and the central place of knowledge in physical education as a foundation to promote and facilitate positive, nurturing perspectives on youngsters’ health and well-being.

As you continue reading through the parts and chapters in this Handbook, you will find that the themes introduced in these introductory chapters will be repeated, elaborated, and contradicted by the distinguished scholars who have contributed to this text. Hopefully, the curriculum seeds planted here will be nurtured as you conceptualize your own understanding of physical education pedagogies.

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Think back to your favorite PE memories from your K-12 school years. Was it a favorite sport that still makes you smile or was it a piece of equipment like the parachute or scooter that first came to mind? Now reflect on that experience and exactly what made it your favorite. Did you learn something specific that changed how you moved for a lifetime? Is your memory more about a positive emotion that came from being with friends, experiencing a novel task, or expressing yourself in a creative activity? Perhaps your memory is of competence and victory and having your status as a skilled mover publicly acknowledged? Do you believe everyone in the class experienced the unit in the same way you did? Why do you think your teachers even chose that content for your class? What did they hope you learned, if anything, and did they attempt to measure that learning? Did your parents know about that unit and what did they think about your participation in it? These are all questions of curriculum and the goal of this chapter is to discuss key curricular questions like these and offer recommendations for effective practices.

Curriculum definition

The definition of “curriculum” varies across time, theory, and educational settings. The word’s Latin root, currere, refers to a course to be run and one common definition of curriculum stays true to that meaning with curriculum being described as a series of prescribed courses students must complete to achieve the finish line of graduation. Those Latin roots also show in the plural form of the word as the plural of curriculum is curricula. Sometimes curriculum is defined as the “what and why” of what schools teach with instruction being the “how” that material is taught. In curriculum theory, many scholars broaden the definition significantly to capture more of the students’ educational experiences. These definitions often vary on two points. First, is a curriculum only planned experiences or does the curriculum include everything the student experiences while at school, planned or unplanned? One aspect of these unplanned experiences is the hidden curriculum (Bain, 1975; Kirk, 1992). For example, in PE students often experience very powerful learning about gender and sport. No formal curriculum has ever stated as a learning outcome, “Students will identify specific sports as boy or girl sports and engage more in their gender appropriate sports.” Yet many students do believe that volleyball is a girls’ team sport and football is for boys, and their participation patterns vary in the two sports accordingly (Azzarito
D. J. Cothran

& Solmon, 2009). These beliefs and behaviors clearly represent student learning, but it was not officially planned for, so should it be considered part of the student experience and therefore part of the curriculum? Second, curricular definitions differ with regard to the impact on the student. Does the student actually have to learn or demonstrate mastery of the content for that content to be considered part of the curriculum or does the fact that the teacher taught it and students participated make it curriculum? A good working definition of curriculum is provided by Lund and Tannehill (2015) who define curriculum as including, “all knowledge, skills, and learning experiences that are provided to students within the school program” (p. 6).

Curricular levels

The concept of a curriculum is an abstract idea and it can be hard to understand and measure without examining it from different perspectives. Glatthorn, Boschee, Whitehead, and Boschee (2015) suggest two ways to think about curriculum levels. One is by viewing it as prescriptive, what should happen, or descriptive, the curriculum in action as experienced by the participants. Another way to examine curriculum is the level from which the individual is viewing the curriculum. Glatthorn and colleagues (2015) suggest looking at the different levels of a curriculum via these six frames: the recommended curriculum, the written curriculum, the supported curriculum, the taught curriculum, the tested curriculum, and the learned curriculum. See Figure 3.1.

The recommended curriculum can be thought of as the “external expert” level of the curriculum. At this level, the curriculum is a formal and political document that provides a framework for programs but rarely does it prescribe specific learning content or activities. For example, most state departments of education provide curricular frameworks for various subject matters, including PE. In Chapter 11, Penney and Mitchell point out a number of factors external to schools, teachers, and students that impact the recommended curriculum.

![Figure 3.1 Glatthorn et al. (2015) levels of curriculum](image-url)
Designing effective programs

The written curriculum (Glatthorn et al., 2015) generally focuses on expanding the expert recommendations into a detailed master plan for use by multiple teachers. Often the goal of the written curriculum is to standardize practice within a more defined setting, perhaps a school district. That standardization can sometimes be perceived as an attempt to control the individual teacher’s decision making (see Petrie’s Chapter 12 for discussion of this perspective). In addition to standardizing, Glatthorn et al. suggest the written curriculum also tries to serve as a mediator between the realities of a local environment and the ideals of the recommended curriculum.

Resources as enhancers and constraints on what can and will be part of a planned program are key considerations at the supported curriculum level. For example, how much time is given to PE and what class sizes will be allowed and what equipment is available for use? Numerous authors have noted the challenges associated with resources and class size in PE (e.g., Bevans, Fitzpatrick, Sanchez, Riley, & Forest, 2010; Dyson, Covelli, DiCesare, & Dyson, 2009).

The taught curriculum may or may not resemble the written and supported curriculum, particularly in a content area like PE which, at least in the United States, does not currently have widespread use of standardizing protocols like textbooks and formal testing that often direct classroom teachers in their practice. It is anticipated that teachers will adapt, not adopt a curriculum based on personal values and individual school and student needs and resources, but how much adaptation can be made and still reflect the recommended or written curriculum varies widely across settings (e.g., Cothran, McCaughtry, Kulinna, & Martin, 2006; Curtner-Smith, Hastie, & Kinchin, 2008).

The tested curriculum is revealed by the content and range of assessment tools used. Those include teacher-made tests as well as formal, standardized tests that may be mandated by the school district or state department of education. A common curricular misalignment in PE occurs at this level as many teachers use fitness testing as a primary assessment even though their curricular content is sport skill or participation based. Increasingly student results on the tested curriculum are being used as an indicator of teacher effectiveness (see McCullick, Gaudreault & Ramos, Chapter 25 in this volume; Rink, 2013).

Glatthorn et al. (2015) suggest thinking about the recommended curriculum as what “ought” to happen while the written, supported, taught, and tested levels are what educators intend to happen in a class. The planned and unplanned changes to students’ knowledge and skills are the learned curriculum. It includes intentional items from the prior levels of curricular planning as well as unintended learning via the hidden curriculum. Students are not passive recipients at this level as they are actively involved in negotiating the class content (Cothran & Ennis, 1997; see Solmon’s Chapter 33 in this volume), and accountability systems (Carlson & Hastie, 1997).

Thus, we can define a curriculum by examining different events or outcomes at each of Glatthorn et al.’s (2015) levels. Thinking about curriculum within levels also assists in assessing outcomes or program quality. By analyzing the curriculum at each level, we can determine if the outcomes listed at the recommended and written curriculum levels, for example, are the same as those students actually experience (learned level) and achieve (tested level). Comparing the teacher’s purpose and content (taught level) with students’ experiences (learned level) gives us a better idea of curricular implementation and concrete reasons why students may or may not have learned (tested level).

Curriculum design and planning

Historically, physical educators have often started their educational planning at a local level with a list of possible activities they might want to teach. Depending on the season as well as time and resources, teachers then decide what will be taught in a school year. Within each of those
D. J. Cothran

typically short units (the multi-activity model is discussed more fully in Hastie & Mesquita, Chapter 5) teachers might have educational goals in mind but rarely is the curriculum developed comprehensively beyond perhaps offering a variety of activities (e.g., dance, individual/dual sports, team sports, fitness). In this multi-activity planning model, the content or activity comes first in planning, not student learning. After selecting the activity, the teacher then decides what specifically the student needs to learn about the sport or movement form and plans the unit. Alternately, the planning starts and stops with the unit selection and the program is largely recreational in nature with no specific learning objectives in mind beyond student engagement. Placek (1983) described these programs as having goals of keeping students “busy, happy, and good.”

The Tyler Rationale

Until recently, programs that did attempt an educational focus likely used the Tyler Rationale (Tyler, 1949, see also Ovens & Butler, Chapter 7) to guide their planning. Tyler’s work was the culmination of over 50 years of American education’s focus on a scientific system of efficiency that originated in factory work analysis. The Tyler model dominated educational planning for decades and is still influential today. He suggested these four questions should guide curricular design:

1. What educational purposes should the school seek to attain?
2. What educational experiences are most likely to achieve these purposes?
3. What is the most effective organization of those experiences?
4. How can it be determined if the purposes have been attained?

Part of the scientific analysis of learning was the goal of identifying independent, discrete aspects of learning that could be taught and measured to document teaching effectiveness and student learning. This desire to articulate the specific sub-components of observable learning led to a second extremely influential publication by Bloom (1956). In Bloom’s Taxonomy of Educational Objectives six levels of student understanding are identified in the cognitive domain. Later work by Bloom and others revised and expanded the original taxonomy of student learning to all three domains.

Standards-based planning

More recently, curricular planning is often guided by a standards-based approach. For teachers who have traditionally started planning with content or by thinking about the activities students will participate in during today’s lesson, the standards-based curriculum is a very different way of looking at the curricular planning process. Planning starts not with activities but rather with broad student learning outcomes, and the design moves backward from outcomes to the tasks/activities needed to attain them. This concept of backward design will be described more fully in the next section. The Tyler Rationale also shares a focus on student learning outcomes, but the philosophical underpinnings of the two approaches (e.g., behavioral vs. constructivist learning, designing up vs. designing down, linear vs. inter-relational) are arguably quite different.

Both Tyler’s (Tyler, 1949) historical focus on educational purposes and the more recent use of educational standards reflect a key question in curriculum design: What is the knowledge of most worth? (Broudy, 1982; Young, 2013). In the past those most valued purposes have often
been called goals. In the United States today, broad student learning outcomes are more likely to be called standards. Internationally the terms may differ, but many countries have developed similar guiding principles for PE programs. (See MacPhail [2015] for an overview of different national standards.) Regardless of the nomenclature the basic principle is the same: curriculum planning starts at the end of the learning process by defining what students should know, value, and be able to do. These expectations are made explicit when planning is directed toward these student learning outcomes. In the Society of Health and Physical Educators (SHAPE) America K-12 Standards for PE (Table 3.1, SHAPE America, 2014) note the repeated use of the term physically literate individual. The term physical literacy is a relatively new one in PE curriculum theory and it is meant as a comprehensive term that captures the multi-faceted nature of student learning in PE (Whitehead & Duncan, 2010). PE is not just about the psychomotor domain, although that contribution does make the content area unique in the school setting, but also is about student learning in the cognitive and affective domains. Incorporating the term literacy into the national standards also parallels the terminology used in the broader educational community to reflect student learning outcomes in other content areas.

Additionally, national standards in most countries often include student outcomes at specific points prior to the final year. These are sometimes called benchmarks or levels, and in the SHAPE America standards (SHAPE America, 2014) are referred to as grade level outcomes. Sometimes the benchmarks are provided in groupings of student grades (e.g., K-2, 3-5, 6-8, 9-12) and at other times, yearly guidance is provided. The goal of these sub-standards is to provide checkpoints along the way to guide educators in the planning process. Table 3.2 provides one example from the SHAPE America standards of how the grade level standards are linked building blocks that extend student learning across the years. Notice how the grade level

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<tr>
<th>Table 3.1 SHAPE America national standards for K-12 physical education (reproduced with permission)</th>
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<tr>
<td>1. The physically literate individual demonstrates competency in a variety of motor skills and movement patterns.</td>
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<tr>
<td>2. The physically literate individual applies knowledge of concepts, principles, strategies, and the tactics related to movement and performance.</td>
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<tr>
<td>3. The physically literate individual demonstrates the knowledge and skills to achieve and maintain a health-enhancing level of physical activity and fitness.</td>
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<td>4. The physically literate individual exhibits responsible personal and social behavior that respects self and others.</td>
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<td>5. The physically literate individual recognizes the value of physical activity for health, enjoyment, challenge, self-expression, and/or social interaction.</td>
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<tr>
<th>Table 3.2 Examples of SHAPE America grade level outcomes (reproduced with permission)</th>
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<tr>
<td>SHAPE America (2014) National K-12 Standards</td>
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<tr>
<td>Standard 1: Demonstrates competency in a variety of motor skills and movement patterns</td>
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<tr>
<td>Kindergarten: Strikes a lightweight object with a paddle or short handled racket</td>
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<td>Fifth Grade: Strikes an object consecutively with a partner using a short handled implement over a net or against a wall in either a competitive or cooperative environment</td>
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<td>Eighth Grade: Strikes with a mature overhand pattern in a modified game for net/wall games such as badminton, volleyball, or pickleball</td>
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<tr>
<td>9-12 Grade: Refines activity-specific movement skills in one or more lifetime activities</td>
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outcomes provide some specific topical guidance but they are not prescriptive with regard to specific content or instructional methods.

**Using standards to guide curriculum design**

National standards offer a valuable but general direction of intended student learning that represents the totality of student learning across the K-12 educational program. Although standards are not a curriculum, they do supply a foundation and framework from which decisions are made. Often a first step in a school’s attempts to offer a standards-based curriculum is to approach the task by adding a link from the newly considered standards to the current curriculum guide and lesson plans. In this approach, the school takes its current curriculum and then looks to see what standards might be addressed by the current structure. For example, if a school offers a weight training unit, the teachers might then declare that unit to be a match for Standard 3 (SHAPE America, 2014) which relates to students’ fitness, while the basketball unit is designated as meeting Standard 1’s (SHAPE America, 2014) focus on movement skills. This haphazard, after-the-fact standard assigning process is not an appropriate way to build a standards-based curriculum that maximizes student learning. With this approach, the real questions of student learning and curricular decision-making remain unanswered (O’Shea, 2005).

Why is weight training an essential life skill for these students to learn in this time and place? What skills are to be learned in basketball and why … and how do those basketball skills relate to other sports in the year’s plan, much less how do they relate to the individual student’s ability to be a healthy, active mover for a lifetime?

**Understanding by Design**

To answer those questions and to fulfill the potential of the curriculum to offer meaningful, high impact learning experiences for students, a process of intentional design, starting with the standards, must be undertaken. One comprehensive model for this process is Understanding by Design (UBD; Wiggins & McTighe, 2005). UBD integrates curriculum, assessment, and instruction with an overarching goal of creating a learning environment that produces students who leave school as active problem solvers with understandings and skills relevant to real life. A key tenet of UBD is the concept of backward design. Just as a driver starts a trip with a destination in mind, a UBD approach to curriculum starts at the end with the final destination in mind and the rest of the trip is then planned to ensure arrival at the final destination. There are three steps in the UBD backward design process (Wiggins & McTighe, 2005): 1) identify desired learning results via unpacking the standards, 2) determine acceptable evidence of learning, and 3) plan the instruction, a phase often called delivering forward.

**Identify the desired results via unpacking the standards**

In UBD, the desired student learning results must be identified first in the planning process. Although the national standards are an important influence on defining outcomes or results, they are just a starting point. The next step in the process is to ask, “What are the enduring understandings and essential questions that underlie the standards?” The essential question is NOT “What do students need to know about basketball?” rather essential questions and enduring understandings examine complex and interconnected links. Instead, an essential question might be, “Why and how do people choose to move?” and throughout the PE class specific
content, like basketball, is examined from the lens of why might someone want to engage in basketball and how do they do that in their community? In this design step, teachers also examine specifically what skills and understandings do we want our students to know, do, and value? This reflective step is often referred to as “unpacking the standards.”

When teachers unpack standards, they identify significant educational values and context that play an influential part in decision making (Lund & Tannehill, 2015). Chapter 36 (Kulinna & Cothran, this volume) discusses in detail teacher beliefs and the role they have in decision making. Although educational values and context influence the development of national standards, in the unpacking stage local stakeholder input starts to differentiate the curriculum. Sometimes that differentiation is influenced by community values and opportunities. One might ask, “What does it mean to be a mover in this time and place in this community?”

For example, it may be a common choice to include cross country skiing in a curriculum for students in Maine but skiing is probably not going to be a curriculum choice for schools in southern California. Too many curricular guides ignore the reality of their setting and offer extremely detailed comprehensive plans for multiple sport and movement forms, yet those plans are totally unrealistic. One of the greatest constraints on curriculum development is the instructional time available to teach content to students (Kelly & Melograno, 2004). For example, a secondary student might only have one semester of PE which would be 90 days in most communities. Over the course of a semester that equates to 75 instructional hours (assuming 50 minute classes), not including instructional time lost to locker room time (probably 15 of the 50 minutes) nor the time lost to circumstances outside the teachers’ control (typically 10% of the available school year) like school assemblies, field trips, and fire drills. What can be realistically accomplished in the remaining 45 instructional hours each year? Limited time and other factors like class size and available equipment also place constraints on what can be accomplished. Keep in mind the focus of the curriculum is on what students can actually learn in the time available, not what the students were exposed to or what the teacher talks about over the course of the year! Thus, when the curriculum is focused on learning outcomes, limited instructional time becomes a major constraint.

Given the limited time available in PE, difficult decisions must be made as to what student learning to prioritize. In addition to community values and resources, a curriculum planner also analyzes student needs and characteristics (Darst, Pangrazi, Brusseau, & Erwin, 2015). What knowledge, experience, attitudes, strengths, and needs do students bring to the program? Probably the biggest change in student needs in the last 15 years is the increasing incidence of overweight and obese students in the K-12 setting. Due to those demographic changes many teachers are actively re-thinking their curriculum to focus more on physical activity than physical skill development and the inclusion of additional wellness and nutrition knowledge in their classes (e.g., Hastie, 2003; Metzler, McKenzie, van der Mars, Barrett-Williams, & Ellis, 2013; for differing views on this topic see Chapter 38 by Weidong Li and Chapter 23 by Cameron, Norman, & Petherick). Other key stakeholders in the curricular decision making process include parents, school administrators, and other teachers. Teachers developing a curriculum attempt to account for all these factors and more when developing their program philosophy and curriculum.

Let us examine an example from a real world curriculum guide. The state of North Carolina (USA) has developed a state level curriculum guide that helps teachers with backward design and curriculum planning. In this guide, the 8th grade essential standard for personal and social responsibility is, The Student will: Use behavioral strategies that are responsible and enhance respect of self and others and value activity (North Carolina Department of Public Instruction, n.d.). What
D. J. Cothran

does this standard mean that a student will know and be able to do? The guide suggests these as possible answers to that important question:

- willingly join others of diverse culture, ethnicity, and gender during physical activity;
- work cooperatively with peers of differing skill to promote a safe school environment;
- recognize causes and then demonstrates potential solutions to issues as related to a safe school environment and the physical activity setting;
- work cooperatively with a group to achieve group goals in competitive as well as cooperative settings;
- display empathy to the feelings of others during physical activities;
- recognize the diversity and/or different cultures differences in participation in physical activity. (p. 25)

Even these unpacked meanings of the standard can be further analyzed for specific student learning competencies. As one example from the North Carolina document (p. 25), a more specific learning outcome is: “demonstrate conflict resolution skills; importance of positive attitude, sportsmanship, etiquette, fair play, and support to teammates and opponents whether you win or lose during group physical activity.”

**Determine acceptable evidence of learning**

After key ideas and essential learning questions have been developed, the second step in the UBD planning process is to determine acceptable evidence of the learning (Wiggins & McTighe, 2005). How will teachers, students, parents, and any other interested stakeholders know that the essential learning has occurred? In UBD, assessment comes before instructional decisions. Instead of looking at the standards and asking “What would be a fun activity to do related to the standards?”, the UBD planner asks “What performance task and/or other assessment tools would demonstrate real understanding by students?” and the answer to that question then guides the instructional decisions. The learning evidence should include a continuum of tools from informal checks on understanding, through traditional observations and tests, to more real world performance tasks and projects to provide multiple perspectives, not a single measure, of student learning (Wiggins & McTighe, 2005). For example, instead of a single fitness assessment of a mile run time, a teacher might collect information about the students’ fitness in the form of an outside-of-class physical activity log, in class pedometer or heart rate information, and a test on cardiovascular fitness principles and planning in addition to the mile run time. For an even more authentic assessment task, the student could train for a local 5k race while keeping a training log and running journal. Some curricular documents identify acceptable levels of performance on assessments. When a content standard also includes performance criteria it is called a performance standard.

**Planning instruction, or delivering forward**

The third and final step in UBD is to plan the instructional activities (Wiggins & McTighe, 2005). Now that the teacher knows what students need to know, and how they will demonstrate their knowledge, learning activities are designed. This phase is often called the “delivering forward” step where the backward design process starts to move forward to the standards where the planning process began. When designing student experiences, Wiggins and McTighe (2005, pp. 197–222) suggest keeping in mind the acronym W. H. E. R. E. T. O.:
Designing effective programs

W = Help the students know Where the unit is going and What is expected? Help the teacher know Where the students are coming from (prior knowledge, interests)?
H = Hook all students and Hold their interest?
E = Equip students, help them Experience the key ideas, and Explore the issues?
R = Provide opportunities to Rethink and Revise their understandings and work?
E = Allow students to Evaluate their work and its implications?
T = Be Tailored (personalized) to the different needs, interests, and abilities of learners?
O = Be Organized to maximize initial and sustained engagement as well as effective learning?

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All these planning steps are designed to change the educational focus from what will be covered to what will be learned. Although presented linearly in this discussion, the process is actually quite iterative and related as the teacher works to build a coherent, cohesive plan that links essential student learning with assessment and educational experiences (Tannehill, van der Mars, & MacPhail, 2015). The process includes much discussion, reflection, and trial and error to find the right balance and links in the final product … which is never final. Effective teachers are constantly monitoring their students and learning and making adjustments to maximize student engagement and learning.

Curriculum mapping

A related planning strategy that some teachers and schools use to ensure the right balance and complete links between curriculum, assessment, and instruction are actually in place is the use of curriculum mapping (Jacobs, 1997, 2004; Udelhofen, 2005). Curriculum maps provide an overview of what occurs in a class with regard to what content is covered, how, when, and for how long. Comprehensive maps also include resources used and assessments. You may already have started to think how valuable a document a curriculum map can be. For example, it would be extremely helpful for the middle school PE teachers to know what learning experiences students had in their elementary PE program. With information about what happened previously in the students’ learning journey, the teacher is better prepared to design the next learning experience. Vertical sequencing is the term used to describe the year-to-year planning process. When the year-to-year planning includes revisiting key concepts that intentionally build on earlier student experiences and competencies, the process is known as curricular spiraling. Rather than a content area being a “one and done” topic, spiraling allows for revisiting a topic, systematically deepening students’ knowledge and experience over the course of several years. Comparing maps across grade levels is an example of a vertical view or articulation of curriculum. Maps also provide a tool for horizontal analysis, a comprehensive look at a single year. For example, the curricular map can show linked concepts of invasion game strategies across units or how fitness is infused throughout the different units to ensure full coverage of the various fitness topics over the course of the year. A horizontal analysis of curricular maps also can provide information to teachers at the same grade level, but in different subject matter areas, about what students are experiencing in other classes. This information can be the start of interdisciplinary planning or supportive activities in multiple areas.

At their most basic level, curriculum maps serve as a curriculum inventory of what was actually taught as teachers record specific lesson content, time spent on the content, and resources used when teaching (Kelly & Melograno, 2004). When used in this way the curriculum map is constructed after the instructional episode and provides a “real time” scope and sequence of how the curriculum was enacted. The scope of a curriculum is the intended content; what students will learn and how deeply they will learn it. The sequence of a curriculum focuses on
the question of timing, specifically when will a topic be taught and how much time will be spent on it (Shimon, 2011). It also includes the order of topics and prerequisites for learning, all of which serves to lay the foundation for knowledge growth. When used in this way the curriculum map can serve as a check on the fidelity of the curriculum implementation, or the “accuracy” in which curriculum was enacted. When maps are used as a curriculum diary, they can also serve as a tool for curricular revision. By having access to what happened in class with regard to the content and time needed for instruction, teachers can develop more accurate and effective future curricular versions.

More commonly, however, curriculum maps are more complex documents that provide a mechanism for teachers to align curricula with standards and share their curriculum with other teachers in meaningful ways (Jacobs, 2004). Instead of being done after the fact as with the curriculum inventory approach, curriculum maps can also be a valuable planning tool where key aspects of the learning process are documented and linked to one another (Jacobs, 2004). A number of templates are available online for schools and teachers to use when developing maps. Simple maps tend to be more calendar style with designated learning topics, assessments, and standards shared in a column method as in Table 3.3 while more complex maps include essential questions for a unit, standards, student skills/understandings, assessment, activities, and resources like the example items in Table 3.4. A well-structured curricular map should help teachers identify repetition or gaps in a program, prompt conversation and reflection among teachers, and support alignment between standards, curriculum, assessment, and instruction (Udelhofen, 2005). The maps are not static documents and are constantly being evaluated, altered, and shared with other stakeholders. Creating a curriculum map is a time consuming process but the potential for curricular coherence exists not just between standards and teacher practices but between standards, teacher practices, assessment, and student learning.

**Table 3.3 Basic curriculum map – organized by month**

<table>
<thead>
<tr>
<th>Month</th>
<th>Content</th>
<th>Skills &amp; knowledge</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>Volleyball</td>
<td>-Serving: underhand and overhand</td>
<td>-Teacher observation skill checklist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Forearm pass</td>
<td>-Rules quiz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Set</td>
<td>-Video self-analysis of game play</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Floor spike</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Rules</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-4-2 offense</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>Weight training</td>
<td>-Equipment use and safety–basic muscle anatomy</td>
<td>Safety quiz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Training principles</td>
<td>Anatomy notebook</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Progression</td>
<td>Training log</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Overload</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Free weight technique</td>
<td>Peer and teacher observation skill checklist</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Lunges</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Squats</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Bench press</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Biceps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Triceps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Overhead press</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Bent row</td>
<td></td>
</tr>
</tbody>
</table>
Designing effective programs

**Table 3.4 Possible items and examples to include in an expanded curriculum map**

<table>
<thead>
<tr>
<th>Enduring understanding</th>
<th>Movement plays an essential role in lifetime wellness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential questions</td>
<td>What is wellness and how does movement play a role in it?</td>
</tr>
<tr>
<td></td>
<td>What wellness resources are available to me and my family?</td>
</tr>
<tr>
<td></td>
<td>How does my current wellness affect my quality of life?</td>
</tr>
<tr>
<td></td>
<td>How can I improve an area of wellness in ways I find meaningful and practical?</td>
</tr>
<tr>
<td>What will the student know and do?</td>
<td></td>
</tr>
<tr>
<td>1. Identify wellness components and explain the role of physical activity in wellness.</td>
<td></td>
</tr>
<tr>
<td>2. Use personal wellness assessment tools to develop a baseline status of current wellness practice in physical activity, stress management, and nutrition.</td>
<td></td>
</tr>
<tr>
<td>3. Create one SMART goal for each area of the wellness evaluation and a four-week plan for attaining each goal.</td>
<td></td>
</tr>
<tr>
<td>4. Maintain a weekly wellness journal that includes analyzing home and community resources to explore physical activity options.</td>
<td></td>
</tr>
</tbody>
</table>

**Link to standards:** This section would include links to specific curriculum standards and grade level outcomes both within and outside of physical education.

**Assessment**

- **Formative:** daily training logs, individual assessment tool results, teacher observation, self-assessment via personal fitness plan rubric
- **Summative:** 1) Wellness quiz focused on fitness components and training principles; 2) Personal fitness plan and evaluation; and 3) Community resource brochure

**Resources:** physical education websites, Fitnessgram and Activitygram, wellness portfolio notebook

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**Curriculum assessment**

Similar to an effective assessment and evaluation plan for individual students, a curricular evaluation plan includes a range of tools used in various ways at multiple times throughout the school year. Given that the purpose of the curricular planning process is student learning, the starting point in program evaluation should be focused on the collected evidence of student learning. These individual student learning evaluation tools also provide program insights. For example, if individual students were evaluated on a tennis skill rubric during that unit, a holistic analysis of the various student tennis scores can reveal program strengths and weaknesses. Perhaps the students generally scored acceptable or higher on the forehand and backhand but their serving scores were much lower than desired. Those results suggest needed changes to next year’s plan with more time designated for the serving skill and/or different teaching methods. Similarly, if the students’ end of semester individual fitness plans show a strong understanding of cardiovascular fitness but less mastery of flexibility concepts and life integration, the curriculum can be altered.

The curricular mapping process is both a planning and an evaluation tool (Jacobs, 2004). A thorough curricular map provides ongoing evaluation as the actual class events are constantly being compared to the original plan with adjustments being made and notes recorded about needed changes for the next time the topic is taught. At a more formal level, the United States Centers for Disease Control developed the Physical Education Curriculum Analysis Tool (PECAT) to provide physical educators with a formal assessment tool specific to the
US national standards. The current version of the PECAT form (available at www.cdc.gov/healthyyouth/pecat/) is based on the 2012 national K-12 standards that included six student standards instead of the current version with five standards. The tool, however, is still quite useful to teachers and school districts interested in a comprehensive analysis of their program’s strengths and weaknesses.

Given that there are numerous stakeholders involved in the formation of the curriculum, those same groups should also be involved in the evaluation (Jewett, Bain, & Ennis, 1995). The primary stakeholders, the students, are rarely asked what they think about the curriculum yet their engagement is critical to any curriculum’s success (Tannehill et al., 2015; Chapter 20 by Oliver & Kirk). Student surveys can easily reveal preferred content, problems in the program, and insights into what students find meaningful in class and outside of school. Focus groups of students can provide immediate and ongoing feedback about program strengths and weaknesses, as well as options. Similar tools could also be used with parents and other community members.

The curriculum of the future

This is an exciting time in PE curriculum design. Although the standards-based movement in the United States has not come without some pitfalls, it has also offered teachers new ways of thinking about, planning for, and achieving long lasting, meaningful student learning. The standards movement and related evaluation metrics are likely to become even more important in PE and teacher evaluation (Rink, 2013). Already several states in the United States have developed state-wide assessment tools that must be used by every school and those test results are shared with parents and other stakeholders. Another trend is that as a field we are actively moving away from a largely ineffective yet dominant model (multi-activity) and are developing new models that show great promise in promoting student learning and engagement (Ennis, 2000; Chapter 4 by Casey). For example, Sport Education (Siedentop, Hastie, & van der Mars, 2011), Teaching Games for Understanding (Griffin & Butler, 2005), and Teaching Social and Personal Responsibility (Hellison, 2011) are all models that have proven effective in a variety of settings. Some of those models are addressed more fully in this handbook (see Chapter 5, by Hastie & Mesquita and Chapter 6 by Thorburn). It seems likely that those models will continue to evolve and new models will be developed to meet the needs of learners in the twenty-first century. Based on current health trends and public health needs, it seems likely and necessary that the field will develop more curricular models to address student wellness specifically. One example of this is a Health Optimizing PE (HOPE) (Sallis et al., 2012) approach to PE that focuses on physical activity as a public health and PE goal.

It also seems likely that current and future models will need to incorporate more technology to enhance planning, instruction, learning, and assessment (Tannehill et al., 2015). How might content, instruction, and evaluation change if every child in class had access to a personal computer or tablet in class? That scenario is already true in some school districts. Do students even need to attend a regularly scheduled PE class during the school day to learn about PE? Already 30 of the 50 US states (National Association for Sport & Physical Education & American Heart Association, 2012) have versions of online PE programs for K-12 students. What should the content of those lessons be? Right now the online courses are designed for individual students but how might online education be an avenue for bringing people together to create a community of likeminded and motivated movers from across a school district, state, or country?
Designing effective programs

Summary of key findings

• Curricular definitions vary greatly. Lund and Tannehill (2015) provide a representative definition of curriculum by describing it as: “all knowledge, skills, and learning experiences that are provided to students within the school program.” (p. 6)
• The hidden curriculum is not part of the school’s intended curriculum but is nonetheless student learning. It is often related to unstated expectations about rules and behavior.
• Curricula are developed, implemented, and understood from a variety of perspectives. They often begin with development by experts and then the curriculum is interpreted and adapted by stakeholders including implementation by an individual teacher and meaning making by students.
• Although the Tyler Rationale and the standards-based movement both claim a focus and starting point on student learning outcomes, the underlying assumptions and methods of the two differ.
• The Understanding by Design (UBD; Wiggins & McTighe, 2005) model is a comprehensive tool to help teachers implement content standards in ways that result in significant and meaningful student learning for a lifetime. The three steps are often presented in a linear fashion but the refining and aligning process is continuous and circular.
• The first step in UBD is to identify desired results. If content standards are guiding the process, the standards must be “unpacked” to identify specific meaningful learning components and links.
• The second step in UBD is to identify acceptable evidence of student learning. Multiple assessment tools are recommended.
• The third step in UBD is to plan instructional activities to engage students in mastering the essential knowledge. This step is sometimes referred to as “delivering forward.”
• Curricular mapping provides a mechanism for aligning essential questions for a unit, standards, student skills/understandings, assessment, activities, and resources as they apply to a specific unit of time.
• Just as an effective student assessment evaluation plan includes multiple tools and checkpoints in time, a curricular evaluation plan should follow a similar multi-step process and include the perspectives of various stakeholders.

Reflective questions for discussion

1. Think about the curriculum you are currently teaching or enrolled in as a student. Analyze those learning experiences from Glatthorn et al.’s (2015) levels of the curriculum: recommended, written, supported, taught, tested, and learned. Identify consistencies and inconsistencies across the levels and suggest reasons why those might occur.
2. Review the SHAPE America K–12 Standards in Table 3.1. Think of a specific school setting that you are familiar with and rank order those standards based on your knowledge of those specific students and their needs. Now create a list of essential questions based on your top two rankings. Using Tables 3.3 and 3.4 as a guide, create a curricular map for one of your essential questions.
3. Select a specific movement form you would like to teach/currently teach (e.g., volleyball passing, personal walking program). Use the W.H.E.R.E.T.O. (Wiggins & McTighe, 2005) acronym to identify specific strategies you could develop to engage students in more meaningful and deeper learning.
4. The curriculum of the future likely includes more evaluation and technology as well as the development of additional curricular models. Are there any features of today’s curriculum that we should be sure to maintain? What do you believe the curriculum of the future will look like?

References


Designing effective programs


