EDITORIAL

PCK for dummies. Part 2: Personal vs Canonical PCK

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Abstract In a previous editorial (Garritz, 2013), we started presenting some features on Pedagogical Content Knowledge considered for “dummies”. In this occasion we will be going further, presenting new recent attributes to the construct. We will present two different conceptions of PCK: the “canonical” PCK (substantiated by systematic research) that can be shared and applied by many teachers, and personal PCK (substantiated by personal experience and beliefs/orientations of a single teacher)."

Conocimiento pedagógico del contenido (CPC) para bobos. Parte 2. CDC personal frente a canónico

Resumen En un trabajo editorial previo (Garritz, 2013), empezamos a presentar algunas características del Conocimiento Pedagógico del Contenido (CPC) consideradas “para bobos”. En esta ocasión iremos más allá, al presentar otros atributos más recientes del CPC, entre ellos dos concepciones diferentes del constructo: el CPC canónico (sustanciado por investigación sistemática), que puede ser compartido y aplicado por muchos profesores, y el CPC personal (basado en la experiencia personal y las creencias y objetivos de la enseñanza de un profesor determinado).

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Introduction

The teachers professional knowledge base is composed of a complete set of knowledge, that include subject matter, pedagogical, assessment, curricular and knowledge of students. All of them impact their conceptions of student needs, the selection of a given textbook and of teaching methods, the presentation of the content at the classroom and questioning patterns, among other things. One teacher does not only need to dominate content knowledge for showing teaching excellence, but he/she needs a model structured for pedagogical purposes, which is related to PCK.

Shulman (1987, p. 8) said about PCK: “It represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction”. In other place, Shulman (1987, p. 9) speaks of “an amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding”. We dare to say that this special physical mixture mentioned by Shulman through the terms “blending” and “amalgam” may be reinterpreted instead as a “chemical change” in which the result of reacting “content” and “pedagogy” makes a new substance that we call PCK (Farré & Lorenzo, 2009). The characteristics of the new substance are absolutely different from those of the reactants as it serves much better than the other two to lead a good class in practice on a specific topic. In this sense, we can assure that PCK is integrative, instead of transformative, as has been discussed by Gess-Newsome (1999).

All of these features related to PCK are treated in a new book that will appear next March (Berry, Friedrichsen, & Loughran, 2015).

Personal PCK

In a recent meeting (The PCK Summit) in Colorado Springs, USA, in October 2012, a set of experts on PCK were discussing about definitions, applications and interpretations of this construct, and the following description was proposed by one of the groups under discussion, that at the end of the meeting was approved by consensus: PCK is a “personal attribute of a teacher, considered both a knowledge base and an action. It is the knowledge of, reasoning behind, planning for, and enactment of teaching a particular topic in a particular way for a particular reason to particular students for enhanced student outcomes” (Carlson & Gess-Newsome, 2013).

It was also approved the Figure 1 that represents the set of professional knowledge base of a given teacher which

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**Figure 1** The teacher knowledge base consists of a series of knowledge that goes to a topic specific subject matter professional knowledge to lecture in a class. There are amplifiers and filters related with teacher beliefs and orientation and the context in which the class is given, going to the classroom practice in which it is displayed the Personal PCK of the teacher. After that practice, it is supposed to become in students’ learning, mainly with another set of amplifiers and filters, given the characteristics of students’ beliefs, prior knowledge and behavior.
culminates in the practice of teaching, through the personal PCK.

The most generalized set of components of PCK are those
given by Magnusson, Krajcik, and Borko (1999), and are
those shown in Figure 2.

Nevertheless, the orientations component has been
recently criticized by Friedrichsen et al. (2011). These
authors proposed three dimensions for science teaching
orientation, instead of the seven ones presented by
Magnusson et al.: a) beliefs about the goals or purposes of
science teaching (learning science, learning to do science, and
learning about science); b) beliefs about the nature of
science (what counts as knowledge, how this is produced and
warranted or justified), and c) beliefs about science teaching
and learning (the role of the teacher, the learner, how
students learn science, how to teach science to make it
comprehensible).

** Canonical¹ PCK **

Sean Smith and Eric Banilower (2012) mentioned in their
extended paper to attend PCK Summit: “We believe that PCK
is a knowledge base shaped by other knowledge bases (e.g.,
content knowledge and pedagogical knowledge). We also
believe that there is both ‘canonical’¹ PCK (substantiated by
systematic research) that can be shared and applied by many
teachers, and personal PCK (substantiated by personal
experience and beliefs/orientations) that may or may not
apply across learners. All teachers have personal PCK,
whether tacit or explicit. Not all teachers possess canonical
PCK”.

How a collective PCK shall be constructed? Park and Oliver
(2008, p. 266) cited that “to employ PCK effectively, teachers
must have knowledge on what students know about a topic
and areas of likely difficulty. ‘Knowledge of students’
derstanding in science’ is a PCK component that includes
knowledge of students’ conceptions of particular topics,
learning difficulties, motivation, and diversity in ability,
learning style, interest, developmental level, and need”.
Further they say (p. 278) that teachers develop their PCK
through a relationship that is in the dynamics of knowledge
acquisition, new applications of that knowledge and reflection
on its application in practice. This assertion also supports the
idea that teachers do not simply receive knowledge that
others create to teach, but produce knowledge for teaching
through their own experiences. In occasions teachers gather
in departmental meetings to discuss on the effectiveness of
certain representations used by some of them, constructing in
this way a Canonical PCK. This characteristic is essential to
view teachers as professionals.

¹ This term has had a religious connotation, but now it has some other
interpretations. For example, in the Webster’s Third International
Dictionary (1971) it is defined as “2: Like or conforming to a general
rule: accorded wide acceptance; SANCTIONED, ORTHODOX,
AUTHORITATIVE”; and as “5: Relating to various of the simplest and
most significant forms or schemata to which general equations,
statements or expressions may be reduced without loss of
generality; STANDARD, BASIC.”

![Figure 2](image.png)

The author of this editorial has developed a Canonical PCK
for teaching acid and bases (Alvarado et al., submitted) by
extracting the most important features of the content
representation exposed by a set of ten-selected High School
teachers on this topic. It was constructed by characterizing
the topics first as conceptual (historical aspects, importance
for learning, relations with the daily environment, knowledge
and skills required for learning, difficulties in the teaching/
learning process, representations and resources to motivate
students, assessment); second as procedural (logical skills,
mathematical skills, experimental skills, communication and
dissemination skills), and, finally, as attitudinal (related to
teachers and with regards to students).

** References **

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