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ABSTRACT

The pedagogical content knowledge (PCK) of six high school biology teachers was investigated using an interview, a questionnaire and class observations. The interview investigated the teacher' content knowledge by proving their view of the organization of biology and the levels of importance that they associate with the topics included within the scope of the subject matter. The data from the interview was used in the construction of a diagram of the teachers' subject matter structures (SMS), while the levels of importance identified was used as a basis for class observation. A questionnaire was used to determine teacher knowledgeableability in the various biological topics and to produce a background profile of each of the teachers.

Class observations were conducted to determine if differences exist in the way teachers teach topics associated with their levels of importance and those in which their knowledgeableability varies.

Not all of the teachers had a well-developed PCK. The data show that the teachers with a more developed PCK tend to vary their teaching methodologies slightly, from teacher-dominated to student-centered strategies when teaching topics that they perceive as important for students to learn. The major ideas of biology that they expressed in their SMS are also perceived as the most important topics for students to learn. These are most often also the topics wherein they had high knowledgeableability...

The teachers with a less developed PCK do not vary their teaching methodologies. Their SMSs appear to reflect textbook sequences or logic of presentation rather than their perception of relationships between topics.

Instructional designs are generally behaviorist, following traditional teaching methodologies. The instructional designs and teaching practices of teachers with more developed PCKs show a very close correspondence.

The factor that appears to have the greatest influence on the development of PCK is a strong knowledge of content. This is made possible by continuing education. The teachers who have master's degrees and have attended more in-service training appear to have better-developed PCKs. They have a deeper understanding of the relationships between the topics in biology.