Abstract

Designing Online Educative Curriculum Material about Chemical Compounds in Grade Seven and Exploring Its Effects on Teachers' Pedagogical Content Knowledge.

Educative Curriculum Materials (ECMs) help teachers to implement the curriculum and achieve its goals. The Teacher Guide (TG) which promotes teacher learning as well as student learning is one of the forms of ECM. Research about designing and exploring how ECMs affect teachers' knowledge is still limited. In the Palestinian Educational context, there is no official TGs for Science curriculum. Teaching the "Chemical Compounds" unit in the seventh grade would be considered as an important opportunity and big challenge as well, for new science teachers especially for those whose field of specialization is not Chemistry .

The aim of this study is to design a TG as an ECM for the "Chemical Compounds" unit in grade seven according to the Palestinian Curriculum. The design is based on Hashweh's model of Pedagogical Content Knowledge (PCK), and Davis & Krajcik framework for designing ECMs. The designed ECM would help to answer the following two questions. First, what are the changes in the PCK of the participants after using the TG for planning? Second, what TG features were relatively beneficial for the science teachers?

I followed a single iteration, design-based research process in my study. It took eight months to design an online ECM. The design process comprises four parallel stages: a literature review, a small study with veteran Palestinian Science teachers, writing the content of the TG, and developing the TG web site. Next, six teachers used the TG for preparing the lessons of the unit. The instruments of the study were semi-structured interviews, open-ended questions tests, open-ended questionnaires, lesson preparations, website stats, and a focus group interview.

The results revealed that there were positive changes in teachers' PCK. The most significant changes happened with teachers whose content area is not Chemistry and have more experience. Those teachers spent more time on the TG website and browsed more pages. The most significant changes occurred in teachers' knowledge about aims, content, curriculum, learners, and teaching strategies. In addition, the results revealed that the useful features in the TG were (1) Using PCK as an explicit framework to organize teacher's knowledge. (2) TG targeted teachers' PCK. (3) TG was related to the context of the teachers. (4) Presenting educational concepts and terms explicitly. (5) Designing the TG as an online resource.

In light of these results the main recommendation of the study is to develop ECMs for different Science topics and to investigate its potential benefits for teachers and students.