**The Role of Volunteers in Early Childhood STEM**

Coral Campbell, Chris Speldewinde - Deakin University

In 2018, we developed materials and resources for a volunteer-aided STEM package of activities for 3-5 year old kindergarten children. The package of material included: Program General Guide booklet that provides an overview of the program, linking into current research around children’s developing understanding about STEM; Activities Guide for Volunteers with activities and strategies for getting started, engaging children, using children’s play experiences to highlight STEM, building on ‘everyday’ STEM explorations, and using appropriate and effective questions; and Facilitators’ Guide - Workshop for Volunteers for training the volunteers.

The research was evaluative in nature, using both quantitative and qualitative data to provide information on the effectiveness of the program. Specifically, the evaluation provides evidence of the impact of the Curious Young Minds STEM Literacy Program on educators/teachers, volunteers and children of the program in terms of effectiveness and sustainability. However, for the purpose of this presentation, the following question will be considered:

What impact has the delivery of the Program had on Volunteers’ understanding of STEM?

This presentation will discuss the research undertaken and its limitations. Evidence suggests that the volunteers’ STEM understandings and capacities to teach STEM to very young children improved across the life of the program.

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**Critiquing collaborative CoRe design as an effective professional development intervention for developing teachers’ PCK for teaching science**

Jared Carpendale - Monash University
Anne Hume - The University of Waikato

Using empirical research, this presentation critiques collaborative Content Representation (CoRe) design as a professional development (PD) intervention for developing teachers’ pedagogical content knowledge (PCK) for teaching science. The research design evolved from previous research that explored how collaborative CoRe design could develop pre-service teachers’ PCK (see Hume & Berry, 2011, 2013) and the researcher’s own professional experiences. Data focused on the knowledge transformations and experiences of three case study teachers as they engaged in authentic professional discussions with six others teachers. These teachers’ PCK was examined before and after the workshop, using interviews and lesson observations.

To improve trustworthiness, two analytical methods were used to critique the effectiveness of the workshops: a deductive approach guided by key characteristics of effective PD from the literature (i.e., content focus, active learning, coherence, duration, and collective participation); and, a comparison of case study participants’ pre- and post-CoRe design PCK. The two sets of findings corroborated and revealed that collaborative CoRe design is an
effective PD intervention for developing teachers’ PCK for teaching science. For the case study teachers, the workshop embraced those key PD characteristics identified, and their PCK developed as a result of working collaboratively, although, each teacher’s development was unique.

References:


Teaching Practice for Enhancing Students’ Scientific Communication Skill Using STS approach

Kannika Chaithong, Sasithep Pitiporntapin, Pramote Chumnanpuen - Kasetsart University

The purpose was identifying the best practices for students’ scientific communication skill (SC skill) improvement, focusing on writing and speaking skill. Classroom action research was performed to investigate the effect of student relationship and their preferable group work through Science Technology Society (STS) approach. The data were obtained from 36 of tenth grade students using students/teacher reflective journal and semi-structured interview. Data were analyzed in three components according to Kulgemeyer and Schecker’s (2009) and Burns’s (2003) frameworks. Approximately 62 percent of students’ reflective journal commented activities which contribute sharing ideas are the most important part. The results point to teaching practices: 1) teacher should provide group discussion after topic implemented, 2) showing students’ worked with commenting help students improve using representation form, and 3) classroom presentation can be a pair/group work depends on students’ relationship. Students preferred to work with their close friends since they can freely share opinions and get feedbacks would make them improved. Furthermore, doing laboratory helps students learn systematically thinking which affect to the data management for creating proper representation form. Overall, the study sheds light on creating activities using STS approach for developing students’ SC skill and the effect of students’ relationship is discussed.

Reference:

Identifying ways that students construct and visualize explanations in scientific drawings: From the perspective of “Norms”

Jina Chang, Joonhyeong Park, Kok-Sing Tang, David Treagust, Mihye Won - Curtin University