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Creating Technological Pedagogical Content Knowledge (TPACK) Through Instructional Consultation

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Abstract: Teachers' knowledge for technology integration is termed as technological pedagogical content knowledge (TPACK)(Mishra & Koehler, 2067). It is contextualised knowledge that emerges through lesson design. One avenue for TPACK creation is instructional consultation which involves dialogic problem-solving between the faculty and academic developer. This paper describes three cases of how the theoretical vocabulary of the TPACK framework can be used to describe the teaching knowledge created through instructional consultation sessions. It then discusses how this can inform the design of faculty development programmes for educational technology.

Reference

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher lnowledge. *Teachers' College Record, 108*(6), 1017-1054. doi:10.1111/j.1467-9620.2006.00684.x

Paper: Introduction

Lecturers' use of technology for pedagogical transformation has not kept pace with the corresponding progress in technology infrastructure at higher education institutions (Kirkwood & Price, 2014). There is a need to consider how lecturers' knowledge for technology integration, termed as technological pedagogical content knowledge (TPACK) (Mishra & Koehler, 2006), can be enhanced. TPACK has been described as a contextualised knowledge form that emerges as teachers design technology-based lessons for their teaching contexts (Koehler, Mishra, & Yahya, 2007). The dialogic processes of instructional consultation involve faculty members discussing and solving teaching problems collaboratively with academic developers (Piccinin, 1999; Rosenfield, 2002). It can be an avenue for supporting TPACK creation. This paper first describes the TPACK framework and illustrates the kinds of TPACK that could emerge through the instructional consultation process. It then discusses how the TPACK framework can be used by higher education institutions to construct their institutional knowledge for teaching with educational technology.

The TPACK framework

The TPACK framework describes technology integration as a complex endeavour that involves teachers engaging and synthesising their technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) in different ways. Teachers could firstly draw upon their PK and CK to formulate pedagogical content knowledge (PCK), which is their unique know-how of teaching without technology. Secondly, teachers could engage their TK and PK through technological pedagogical knowledge (TPK) which describes their knowledge for enacting various pedagogies (e.g. collaborative learning, case-based learning) with technology tools (e.g. online discussion forum, wikis). Thirdly, teachers could use their technological content knowledge (TCK) to create different ways of representing subject content with technology (e.g. concept animations, scientific simulations). These intermediary forms of knowledge embody the different facets that teachers may need to consider as they formulate TPACK, or their synthesis of technological, pedagogical, and content considerations into actual technology-based lessons (Mishra & Koehler, 2007). The processes and outcomes of instructional consultation have been examined (Kebaetse & Sims, 2016; Piccinin, Cristi, & McCoy, 1999) but its potential for facilitating the creation of teaching knowledge such as TPACK has yet to be articulated. These seven TPACK constructs provide theoretical lenses for decoding such kinds of knowledge creation processes.

Methodology

Data for this study was collected through regular instructional consultation sessions conducted by the researcher. Faculty members were invited to sign up for consultation sessions to discuss their plans for technology integration and were informed that meeting notes will be made of the ideas that were discussed and co-constructed during the session, and their informed consent was sought for study participation. After the meeting, the notes were sent to the participants for member checking. Only the notes of consenting participants were analysed and the rest were archived as a record of consultation. To analyse the data, the notes were broken down into sentences as a unit of analysis and coded using the seven TPACK constructs defined by Mishra and Koehler (2006). The findings from three consultation sessions are described in this paper.

Results

Case 1 – Active distance learning

Lecturer 1 conducts distance learning courses through video conferencing and desires to enhance students' active learning. The researcher first developed the lecturer's TK by demonstrating various features of the video conferencing tool such as annotation, file sharing, and breakout room creation. Drawing upon this knowledge, the lecturer and researcher dialogued and generated various forms of TPK for supporting active learning. These include doing formative evaluation with online polls, using problem-based learning to structure students' breakout room meetings, and organising resources in the learning management system to support students' self-directed learning.

Case 2 – Student lecture engagement

Lecturer 2 teaches a content-heavy course and wanted to explore if introducing clicker quizzes could

enhance engagement during lectures. The researcher asked the lecturer to first consider the pedagogies that support factual learning and several PCK-related ideas were co-constructed, including using flipped learning to facilitate pre-class content learning; using case-based instruction to introduce students to abstract concepts; using role-plays to immerse students in the realities of the conceptual ideas; and rotating these approaches flexibly based on content suitability. Several forms of TPK then emerged out of these ideas. The lecturer realised that game engines such as Kahoot™ need not be restricted to content quizzes but could be used as a way to poll students about their opinions. Students could also use digital storytelling to articulate their personal narratives of the concepts they have learnt.

Case 3 – Redesigning online assessment

Several lecturers teaching a programme attended by practicing professionals wish to explore how the assessment of students' online participation could be expanded beyond online discussions. Considering the students' profile, the group first constructed PCK-related ideas for authentic assessment. TPK-related ideas were then constructed to strengthen the connections between online assessment and their overall course deliverables. These included awarding marks for the completion of online quizzes, pair-based creation of mindmaps, online peer critiques, and quick reflections with online sticky programmes such as Padlet™.

Discussion and future work

Existing studies of instructional consultation has described the process as one involving coaching, modelling, scaffolding, and exploration (Kebaetse & Sims, 2016). The three cases analysed in this study illustrate that contextualised teaching knowledge can be created through instructional consultation. Educational technologies are viewed as critical for supporting pedagogical transformations in higher educations (Englund, Olofsson, & Price, 2017) but there is a general dearth of established models for its practice (Ertmer & Ottenbreit-Leftwich, 2013). The TPACK framework can provide higher education institutions with the theoretical vocabulary to construct their institutional knowledge for teaching with educational technology. This provides a grounds-up perspective to understand faculty development needs for educational technology. Further work through thematic analysis will be carried out to identify common patterns of TPACK required to support different teaching and learning contexts faced by higher education faculty.

References

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