


# Chapter 4

## From Zoom to Bloom: Developing the Self- Efficacy of Physics Teachers Through Collaborative Online Professional Development

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### ABSTRACT

*The study examined how Collaborative Online Teacher Professional Development (COTPD) can best improve the Technological Pedagogical Content Knowledge (TPACK) and Self-Efficacy (SE) of physics teachers. Focus group data collected from participants of the Frontiers International e-School, through which physics teachers were supported in bringing Nobel prize-winning physics to the classroom. The study set out to understand the benefits and challenges of COTPD through the participants' socially constructed subjective perspectives. A thematic map of findings identified key elements and considerations for best utilising online platforms*

DOI: 10.4018/979-8-3693-3338-9.ch004

*to facilitate COTPD. The study found improvement in TPACK and SE for both experienced physics teachers and out-of-field physics teachers through the Frontiers International e-School's COTPD model.*

## **INTRODUCTION**

A severe shortage of teachers in physics exists (Department of Education and Skills, 2017), denying students access to specialist physics teachers and high-quality learning experiences. This shortfall of highly trained teachers of physics is contributing to the deficit of skilled STEM workers required by industry. The shortage of qualified physics teachers has resulted in many teaching roles being filled by out-of-field (OOF) teachers from other science backgrounds, resulting in 20-30% of physics teachers having not studied physics at university (Price et al., 2019; Caldis, 2017; Banilower, Trygstad and Smith, 2015).

This study set out to learn how Collaborative Online Teacher Professional Development (COTPD) may help enhance the technologically integrated teaching practice and the Self-Efficacy (SE) of physics teachers, including OOF teachers. By exploring the experiences of physics teacher who had participated in a multi-day COTPD, this study developed a thematic map of the key elements and considerations for best utilising online platforms to facilitate collaborative teacher professional development.

### **Teacher Professional Development**

Teaching can be an isolating profession (Hertz et al., 2022), providing little opportunity to learn collaboratively from other teachers. Many teachers struggle to access and benefit from professional development training (OECD, 2019), with 54% reporting a conflict with their work schedule being a barrier. With 76% of teacher professional development provision taking place on-site, geographical and time barriers prevent teachers from accessing support and additional training.

In response to these challenges, Hollebrands and Lee (2020) argued that teachers facing the challenge of integrating pedagogical practices, digital tools and curricular resources with limited access to professional development opportunities need additional online professional development supports. Online teacher professional development can reduce geographical boundaries for teachers in accessing training (Elliott, 2017), while also providing the opportunity for teachers to collaborate with other professionals from distant locations with whom face-to-face interaction would be impossible.

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