

Online teacher professional development: A research synthesis on effectiveness and evaluation; (Technology, Knowledge and Learning) *Research focus and methods used in OTPD studies analyzed (N=115)*

First Author	Research Focus	Method	Notes
Al-Balushi (2015)	OTPD effectiveness (teaching practice)	Mixed methods (pre-/post-design; observation)	
An (2018)	OTPD effectiveness (attitudes/perceptions, self-efficacy/self-confidence)	Mixed methods (pre-/post-design; content analysis*)	
Arifani (2020)	OTPD effectiveness (teaching practice)	Quantitative (questionnaire)	self-reports from students on teachers' practice
Arifani (2019)	OTPD effectiveness (competencies)	Quantitative (questionnaire)	self-reports from students on teachers' practice
Aykan (2022)	OTPD effectiveness and evaluation	Qualitative (case study; interview; observation; content analysis)	focus on lesson study approach in OTPD
Barquero (2018)	OTPD effectiveness (attitudes/perceptions)	Qualitative (case study; observation; questionnaire; content analysis; analysis of activity patterns)	
Boltz (2021)	OTPD effectiveness (competencies, attitudes/perceptions)	Mixed methods (questionnaire; analysis of activity patterns)	
Bosch (2019)	OTPD effectiveness	Quantitative (pre-/post-design; questionnaire)	
Boulay (2013)	OTPD evaluation	Qualitative (interview)	
Boumadan (2020)	OTPD evaluation	Quantitative (questionnaire)	
Brennan (2018)	OTPD evaluation	Qualitative (interview)	interview one year after intervention
Brodahl (2016)	OTPD evaluation	Quantitative (questionnaire)	focus on perceptions of podcasts for pd
Budiastra (2020)	OTPD effectiveness (competencies, student learning)	Quantitative (pre-/post-design; test)	
Bustamante (2013)	OTPD effectiveness	Qualitative (case study; interview; questionnaire; content analysis)	effectiveness assessment including instructor evaluation
Chaipidech (2022)	OTPD effectiveness (competencies)	Quantitative (pre-/post-design; questionnaire)	self-assessment of competencies
Chien (2022)	OTPD evaluation (attitudes/perceptions)	Mixed methods (questionnaire)	quantitatively and qualitatively analyzed
Ching (2014)	OTPD effectiveness	Mixed methods (content analysis; analysis of activity patterns)	
Choi (2014)	OTPD effectiveness (competencies, teaching practice)	Mixed methods (observation; content analysis)	quantitative analysis of discussion posts
Clary (2017)	OTPD effectiveness (competencies; engagement/social presence)	Quantitative (pre-/post-design; test)	
Compen (2021)	OTPD effectiveness (student learning)	Mixed methods (pre-/post-design; test; observation)	teacher tests and student tests (testing students' financial literacy before and six weeks after OTPD)

Correnti (2021)	OTPD effectiveness (teaching practice, student learning)	Mixed methods (pre-/post-design; test; observation)	
Dahri (2022)	OTPD effectiveness (competencies, attitudes/perceptions)	Quantitative (pre-/post-design; test)	comparison mode
Dahri (2021)	OTPD evaluation	Quantitative (questionnaire)	
De Santo (2016)	OTPD evaluation	Mixed methods (observation; questionnaire; content analysis; self-observation)	
Diac (2014)	OTPD evaluation	Mixed methods (questionnaire)	quantitatively and qualitatively analyzed
Ding (2015)	OTPD effectiveness and evaluation	Quantitative (case study; questionnaire; analysis of activity patterns)	
Engeness (2020)	Engagement/social presence	Mixed methods (questionnaire)	quantitatively and qualitatively analyzed
Francis-Poscente (2013)	OTPD effectiveness (engagement/social presence)	Qualitative (pre-/post-design; interview; observation; content analysis)	transferring lesson study into OTPD; effectiveness assessment including instructor evaluation
Gamrat (2014)	Engagement/social presence	Qualitative (case study; pre-/post-design; interview; content analysis; analysis of activity patterns)	
Giberti (2022)	OTPD effectiveness (competencies) and evaluation	Qualitative (questionnaire)	
Golding (2018)	OTPD evaluation	Qualitative (focus groups; interview; content analysis; observation)	comparison mode; including instructor evaluation
Gunawan (2021)	OTPD effectiveness (competencies) and evaluation	Mixed methods (case study; test; questionnaire; observation)	
Gunter (2017)	OTPD effectiveness (teaching practice, engagement/social presence, attitudes/perceptions)	Mixed methods (pre-/post-design; questionnaire)	quantitatively and qualitatively analyzed
Gynther (2016)	Program design analysis, OTPD effectiveness	Qualitative (observation; interview); DBR	relationship between design elements and intended outcomes/comparison mode; including instructor evaluation
Hafour (2022)	OTPD effectiveness (teaching practice) and evaluation	Mixed methods (pre-/post-design; questionnaire)	quantitatively and qualitatively analyzed
Hall (2013)	OTPD effectiveness (competencies)	Mixed methods (questionnaire; interview; content analysis)	
Hanline (2013)	OTPD effectiveness (teaching practice, self-efficacy/self-confidence)	Mixed methods (case study; pre-/post-design; questionnaire; content analysis)	
Herbert (2016)	Teachers' needs, attitudes/perceptions (NO PROGRAM)	Qualitative (case study; interview)	including instructors' perceptions
Hinostroza (2021)	OTPD effectiveness (competencies, teaching practice)	Mixed methods (pre-/post-design; test; analysis of activity patterns; observation; interview)	
Ho (2016)	OTPD effectiveness (competencies, self-efficacy/self-confidence)	Mixed methods (pre-/post-design; test; questionnaire)	comparison mode; quantitatively and qualitatively analyzed

Hrytsenchuk (2021)	Teachers' (tech) attitudes, OTPD effectiveness (competencies)	Mixed methods (pre-/post-design; questionnaire)	quantitatively and qualitatively analyzed
Huilcapi-Collantes (2020)	OTPD effectiveness (competencies) and evaluation	Quantitative (pre-/post-design; test)	
Irfannuddin (2021)	OTPD effectiveness (teaching practice)	Mixed methods (pre-/post-design; test; questionnaire; content analysis)	
Jen (2022)	Program design analysis, OTPD evaluation	Qualitative (questionnaire); DBR	
Jimoyiannis (2013)	OTPD effectiveness (teaching practice) and evaluation	Mixed methods (questionnaire)	quantitatively and qualitatively analyzed; six weeks after OTPD
Jocius (2022)	OTPD effectiveness (attitudes/perceptions, self-efficacy/self-confidence)	Mixed methods (pre-/post-design; questionnaire; interview)	pre-/post-survey and additional six-month follow-up surveys; effectiveness assessment including instructor evaluation
Joubert (2020)	OTPD effectiveness	Qualitative (case study; observation; content analysis; questionnaire)	implementing lesson study in a BL approach
Kandlhofer (2021)	Program design analysis, OTPD evaluation	Mixed methods (observation; interview; questionnaire; test; pre-/post-design); DBR	pre- and post-questionnaires for instructors for feedback on the training system
Kao (2014)	Teachers' overall self-efficacy/self-confidence and attitudes/perceptions (NO PROGRAM)	Mixed methods (questionnaire; interview)	
Kaul (2018)	OTPD effectiveness (engagement/social presence)	Qualitative (case study; content analysis)	
Kennedy (2019)	OTPD effectiveness (competencies)	Mixed methods (case study; pre-/post-design; questionnaire; analysis of activity patterns; interview; content analysis)	
Kim (2020)	Teachers' motivation, self-efficacy/self-confidence, engagement/social presence (NO PROGRAM)	Quantitative (questionnaire)	relationship between these variables
Knie (2022)	Program design analysis, OTPD effectiveness (teaching practice) and evaluation	Quantitative (within-subject design; pre-/post-design; questionnaire)	
Krasnova (2019)	OTPD effectiveness	Quantitative (questionnaire)	
Laurillard (2016)	OTPD effectiveness	Mixed methods (case study; pre-/post-design; content analysis; questionnaire)	
Lazarinis (2019)	Program design analysis, OTPD evaluation	Quantitative (questionnaire)	
Lee (2020)	OTPD effectiveness (teaching practice, attitudes/perceptions)	Mixed methods (analysis of activity patterns; content analysis; questionnaire)	multiple questionnaires and six-month follow-up survey
Lee (2014)	OTPD effectiveness (engagement/social presence)	Mixed methods (content analysis; analysis of activity patterns)	
Lee (2016)	OTPD effectiveness (competencies, engagement/social presence) and evaluation	Mixed methods (analysis of activity patterns; content analysis; interview)	

Luebeck (2017)	OTPD effectiveness and evaluation	Mixed methods (pre-/post-design; test; questionnaire; interview; content analysis)	pre-/post self-assessment; content analysis of teachers progress reports
Lynch (2021)	OTPD effectiveness (competencies) and evaluation	Quantitative (pre-/post-design; test)	
Mailizar (2021)	Teachers' attitudes/perceptions (NO PROGRAM)	Quantitative (questionnaire)	
Marchak (2021)	Program design analysis; OTPD effectiveness and evaluation	Mixed methods (content analysis; questionnaire)	feedback questionnaire and five-month follow-up questionnaire
Marocco (2019)	Teachers' needs, program design analysis, OTPD effectiveness	Mixed methods (questionnaire; focus groups)	training needs analysis; needs questionnaire and feedback questionnaire
Martínez (2020)	OTPD effectiveness (competencies, engagement/social presence) and evaluation	Mixed methods (questionnaire)	quantitatively and qualitatively analyzed
Mavroudi (2018)	Teachers' needs, OTPD effectiveness (competencies, self-efficacy/self-confidence)	Quantitative (case study; questionnaire)	
McConnell (2013)	OTPD effectiveness (competencies, engagement/social presence)	Qualitative (case study; observation; focus groups; interview; content analysis)	comparison mode; content analysis of instructors' reflections for both modalities; effectiveness assessment including instructor evaluation
Michos (2020)	Program design analysis, OTPD effectiveness (teaching practice)	Mixed methods (case study; analysis of activity patterns; content analysis; questionnaire; interview); DBR	comparison mode
Milewski (2018)	OTPD effectiveness (competencies, engagement/social presence)	Qualitative (observation; content analysis)	
Moen (2018)	OTPD evaluation	Qualitative (case study; interview)	focus on perception of videos for pd
Mswazie (2019)	Teachers' motivation, OTPD effectiveness and evaluation	Qualitative (case study; interview)	
Murai (2020)	Program design analysis, OTPD effectiveness and evaluation	Mixed methods (pre-/post-design; questionnaire; observation; content analysis; interview); DBR	
Mystakidis (2021)	OTPD evaluation	Mixed methods (case study; questionnaire; focus groups)	
Ndlovu (2014)	Program design analysis, OTPD evaluation	Mixed methods (questionnaire); DBR	quantitatively and qualitatively analyzed; including instructor evaluation
Onguko (2014)	Program design analysis, OTPD effectiveness	Qualitative (interview); DBR	including analysis of OTPD potential for challenging contexts; follow-up interviews one year after intervention
Papadakis (2012)	OTPD evaluation	Mixed methods (questionnaire)	quantitatively and qualitatively analyzed
Pombo (2016)	Program design analysis, OTPD effectiveness (teaching practice)	Qualitative (questionnaire; observation); DBR	
Power (2016)	OTPD effectiveness (attitudes/perceptions)	Quantitative (pre-/post-design; questionnaire)	

Ramírez-Montoya (2016)	OTPD effectiveness (competencies, teaching practice) and evaluation	Mixed methods (questionnaire; content analysis)	
Ravitz (2017)	Program design analysis, OTPD effectiveness (competencies, attitudes/perceptions)	Quantitative (case study; pre-/post-design; questionnaire)	course characteristics associated with different outcomes
Reeves (2017)	Teachers' tech readiness and attitudes/perceptions, OTPD effectiveness (competencies)	Quantitative (pre-/post-design; questionnaire)	
Riel (2012)	OTPD effectiveness (teaching practice, student learning)	Quantitative (analysis of activity patterns; pre-/post-design; questionnaire)	student self-assessment questionnaire
Russel (2021)	OTPD effectiveness	Mixed methods (test; questionnaire; teacher log (analysis of activity patterns))	comparison mode; questionnaires for teachers and students (students commented on teachers' practice)
Sahin-Topalcengiz (2020)	OTPD effectiveness (teaching practice) and evaluation	Qualitative (case study; interview)	
Saiful (2020)	Teachers' attitudes/perceptions (NO PROGRAM)	Mixed methods (questionnaire; interview)	
Sánchez-Narváez (2017)	OTPD effectiveness (competencies)	Qualitative (interview; observation; content analysis; questionnaire)	
Schreiber (2020)	OTPD effectiveness (engagement/social presence)	Qualitative (content analysis; interview)	effectiveness assessment including instructor evaluation (self-report of instructor = researcher)
Şenel (2021)	Program design analysis, OTPD effectiveness (competencies, attitudes/perceptions)	Quantitative (questionnaire); DBR	
Simpson (2016)	OTPD effectiveness	Qualitative (interview; content analysis)	
Situmorang (2022)	OTPD effectiveness and evaluation	Quantitative (questionnaire; test)	
Siyamta (2020)	OTPD effectiveness (competencies)	Quantitative (pre-/post-design; questionnaire)	comparison mode; teachers self-rated their competencies
Sompong (2016a)	Program design analysis, OTPD evaluation	Mixed methods (questionnaire; focus groups)	
Sompong (2016b)	Program design analysis, OTPD evaluation	Mixed methods (questionnaire; test; pre-/post-design)	quantitatively and qualitatively analyzed
Stevenson (2019)	OTPD effectiveness (competencies, teaching practice) and evaluation	Mixed methods (observation; pre-/post-design; questionnaire; interview)	
Syamsuri (2020)	OTPD effectiveness (competencies)	Mixed methods (observation)	comparison mode; quantitatively and qualitatively analyzed
Tahiri (2019)	OTPD effectiveness (engagement/social presence)	Mixed methods (interview; analysis of activity patterns)	Teachers' engagement in df (relation to program success)
Tamani (2021)	OTPD effectiveness	Mixed methods (interview; observation; analysis of activity patterns; questionnaire)	effectiveness assessment including instructor evaluation; instructor interviews, teacher questionnaires
Terrazas-Arellanes (2019)	OTPD effectiveness (student learning)	Quantitative (pre-/post-design; questionnaire; teacher log (analysis of activity patterns); test)	pre-/post- surveys (teachers) and tests (students)

Tinoca (2013)	OTPD effectiveness and evaluation	Mixed methods (case study; questionnaire; content analysis)	
Topuzov (2021)	Program design analysis, OTPD effectiveness	Quantitative (pre-/post-design; test)	
Ulmanc-Ozoluna (2019)	OTPD evaluation	Quantitative (questionnaire)	
Ung (2022)	OTPD effectiveness (competencies, self-efficacy/self-confidence), teachers' expectations	Not stated	
Urban-Woldron (2013)	OTPD effectiveness (competencies, engagement/social presence)	Mixed methods (questionnaire; content analysis)	relationship between engagement and effectiveness (competencies)
Vezetiu (2020)	OTPD effectiveness	Quantitative (content analysis; questionnaire)	statistical analysis of teachers' grades for completed projects
Vinagre (2017)	OTPD effectiveness (competencies, engagement/social presence)	Mixed methods (case study; content analysis; questionnaire)	
Vu (2014)	OTPD effectiveness	Mixed methods (questionnaire; teacher logs (content analysis))	
Walkington (2021)	OTPD effectiveness and evaluation	Qualitative (case study; pre-/post-design; questionnaire)	
Wathne (2017)	OTPD evaluation	Mixed methods (case study; questionnaire; interview)	focus on perception of videos for pd
Weinhandl (2020)	Program design analysis, OTPD evaluation	Qualitative (questionnaire); DBR	
Wuryaningsih (2019)	OTPD effectiveness	Quantitative (pre-/post-design; test)	comparison mode
Xie (2017)	OTPD effectiveness (competencies)	Mixed methods (questionnaire; interview; content analysis)	context factors related to effectiveness; content analysis of teachers' self-reflections
Zacharias (2017)	Engagement/Social presence	Quantitative (questionnaire)	differences in social presence and autonomy/comparison mode
Zhang (2019)	Relationships among teachers' motivational beliefs, motivational regulation, and engagement	Quantitative (questionnaire)	
Zhou (2020)	OTPD effectiveness (self-efficacy/self-confidence)	Quantitative (pre-/post-design; test)	add purpose: developing a computer science teaching self-efficacy instrument
Zimmer (2022)	OTPD effectiveness (competencies, teaching practice, self-efficacy/self-confidence)	Mixed methods (questionnaire; pre-/post-design; analysis of activity patterns; focus groups)	including questionnaires for personal needs analysis

*content analysis: content analysis of discussion posts, materials, artifacts created, protocols, conversations, etc.