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Strengthening Teaching Presence in Specialized E-Learning: Moving from Self-Paced to Instructor-Led Training on Deuterium Dilution

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Abstract

This study reports on the first design cycle of an instructor-led online course on the deuterium dilution technique for early-career nutritionists, postgraduate students, and junior researchers. Informed by studies suggesting that higher teaching presence in online courses is associated with improved engagement and satisfaction compared to purely self-paced formats, the course was conceived to complement existing self-paced modules by providing clearer structure, higher interaction, and instructor/facilitator support. Using a design-based research (DBR) approach organized around the Analysis, Design, Development, Implementation, Evaluation (ADDIE) model, this cycle explored: the feasibility of introducing instructor-led components in a specialized, globally offered course and participants' perceived value of the added teaching presence. The four-week programme combined self-paced lessons with three online sessions and weekly learning activities, including community-building, reflective discussions, problem-based and application-related assignments. Twenty participants from ten countries across four continents enrolled; fourteen completed the course and post-course survey, with responses indicating high perceived value for course components—content relevance (93% agreeing), well-structured design (86%)—and strong appreciation of instructor-led elements—with participants most frequently selecting the weekly study plan (79%), webinars (71%), and instructor/facilitator support (57%/50%) as advantageous. Challenges centred around lower perceived value of peer interaction and webinar timing. From these findings, we outline emerging design principles: reducing coordination demands in collaborative activities, aligning synchronous activities with participants' schedule, ensuring visible teaching presence through webinars, frequent feedback, and support channels. These insights inform subsequent DBR cycles, offering transferable guidance to enhance online teaching presence in specialized training on stable isotope techniques.

Keywords: design-based research; instructor-led online learning; nutrition education; teaching presence; online course design