MC Test for Assessing Teachers' Digital Competencies: AI-Supported Development and Results of the Pre-Pilot Study

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Abstract

Digital competencies form a central and growing part of the curriculum for prospective science and technology teachers. DiKoLAN-CH specifies the subject-specific digital competencies relevant for teaching science and technology in Switzerland. To assess the digitalization-related competencies of pre-service science teachers according to DiKoLAN-CH, a multiple-choice (MC) test was developed. In a pre-pilot study, university students from Switzerland trialed a multiple-choice test based on DiKoLAN-CH. The aim was to test the comprehensibility and psychometric suitability of the MC test for the target population. AI was used to develop the MC test with the aim of shortening the process of finding items and distractors and, if necessary, improving its quality. The goal was to develop literature-based and content-structured prompts for generating tasks, correct solutions, and plausible distractors. The generated items were then subjected to an expert rating and tested for their psychometric suitability.

The presentation will discuss possible applications of AI in the development of MC tests, introduce the test instrument, and present selected results from the pre-piloting phase.

Keywords: digital skills, multiple, choice test, piloting, prompt engineering

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