

5 - Teaching-Learning Sequences as Innovations for Science Teaching and Learning | Empirical

SP - (16055) - EFFECTS OF PRESENTATION MODES OF LAB INSTRUCTION AND OF SELF-EFFICACY ON LEARNING PERFORMANCE

Valerie Amacker (Switzerland)¹; Markus Wilhelm (Switzerland)¹; Dorothee Brovelli (Switzerland)¹

1 - University of Teacher Education Lucerne

Short Abstract

In this study with 821 schoolchildren between the ages of 12 and 16, the influence of the mode of presentation of a laboratory instruction and the self-efficacy for experimenting on learning performance is determined. For this purpose, a 90-minute workshop was developed about visible and infrared optics. The students already had a certain level of prior knowledge on visible optics, while the subject of infrared radiation had not yet been dealt with in class. In this workshop the learners carry out six different experiments in one of three experimental groups with lab instructions which include either pictures and text or pictures and oral instructions or videos. The three modes of lab instructions contain the same text and image material and only differ in the presentation mode.

The results of the investigation indicate how lab instructions should be designed so that pupils with different levels of self-efficacy for experimenting can independently and successfully carry out simple experiments. The analysis of the data suggests that pupils with low self-efficacy in conducting science experiments show better learning progress when they work with video instructions or picture-oral instructions. Picture-text instructions are particularly suitable for learners with high expectations of self-efficacy. With an average expectation of self-efficacy, all three modes of instruction lead to the same learning performance.