

SYMPAB - (16067) - DIAGNOSING TELEOLOGICAL MISCONCEPTIONS: CAPTURING DECLARATIVE AND PROCEDURAL PEDAGOGICAL CONTENT KNOWLEDGE OF BIOLOGY PRE-SERVICE TEACHERS

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Short Abstract

Diagnosing and confronting teleological misconceptions in biology classrooms is particularly relevant for supporting students toward learning scientific concepts about evolution. Important for this is the pedagogical content knowledge (PCK; knowledge about student understanding) of pre-service teachers, which can be differentiated into two types of knowledge - declarative and procedural PCK. Here, the declarative PCK includes factual knowledge ("knowledge that") and the procedural PCK comprises action-oriented knowledge ("knowledge how"). In order to capture both types of knowledge adequately, a questionnaire on evolution (declarative PCK) and a simulated classroom environment - the Simulated Classroom Biology (SCR^{Bio}; procedural PCK) are used. Within the SCR^{Bio} the pre-service teachers can take on the role of teachers and interact with virtual students in a simulated classroom environment. For this purpose, evolutionary biological questions, which can be selected by the teacher, and corresponding student answers (anthropomorphic, teleological, use or disuse, scientific) were integrated into the SCR^{Bio}. The task of the pre-service teachers is to address evolutionary biology questions to the virtual students and to diagnose their answers. The sample comprises 51 pre-service teachers. The aim of the study is to investigate, (1) To what extent are pre-service teachers able to diagnose and differentiate teleological misconceptions from other specific misconception categories (anthropomorphic, use or disuse)? and (2) To what extent is there a relationship between declarative and procedural PCK of pre-service teachers? The results show that teleological misconceptions were diagnosed in only 57.5% of the virtual student answers. Furthermore, there is only a slight correlation ($r = 0.279$; $p < 0.05$) between the declarative PCK shown in the questionnaire and the diagnosis of teleological misconceptions in the SCR^{Bio} (procedural PCK).

Keywords: Misconception in Evolution, PCK of Pre-Service Teacher, Simulated Classroom Environment