

## Student Self-Efficacy in The Teaching and Learning Environment of Undergraduate Natural Sciences

Dr. Roné Vorster-de Wet, Lynette van der Merwe, Lindi Nel

University of the Free State, South Africa

### Abstract

**Introduction:** An in-depth study was conducted on student self-efficacy in the teaching and learning environment of undergraduate Natural Sciences students at the University of the Free State. The aim was to develop guidelines to improve student self-efficacy. Self-efficacy refers to people's beliefs in their capabilities to achieve. Self-efficacy theory postulates a bi-directional influence between self-efficacy and achievement. This research originated in response to the recognition of a gap regarding guidelines to improve student self-efficacy. Self-efficacy theory, in conjunction with its determining issues, provided the platform to develop guidelines to improve student self-efficacy. **Methodology:** A mixed-methods sequential explanatory research design was used with a quantitative and qualitative phase and answered the research questions within a pragmatist paradigm. The research methods in the quantitative phase comprised the instrument development and a questionnaire to identify factors that influence the status of self-efficacy. In the qualitative phase, semi-structured interviews with students and lecturers were conducted to identify factors influencing student self-efficacy. **Results:** The quantitative phase identified the factors used to compile the questions for the semi-structured interview. The qualitative data emphasized self-regulated learning, self-regulated motivation, student engagement, student autonomy and future careers in the teaching and learning environment as interrelated issues with self-efficacy. **Conclusion:** This study generated comprehensive knowledge of issues interrelated with self-efficacy among undergraduate Natural Sciences students. This culminated in development of three guidelines to assist lecturers in supporting student self-efficacy in the classroom. The guidelines may improve student self-efficacy and academic achievement in undergraduate Natural Sciences students.

**Keywords:** academic achievement; guidelines; mixed-methods research; semi-structured interview; student support