

The thesis is focused on four levels of the Inquiry-Based Science Education (IBSE). The first chapter describes IBSE in detail and also highlights the studies focused on the efficiency of IBSE.

Pendulum and hydrostatic pressure experiments worksheets were created on the four levels of IBSE. A questionnaire reflecting some aspects of students' personalities were created and students were split into groups according to their answers. Another questionnaire about experiments and understanding of the physical phenomena was created.

The central theme of this thesis focuses on the students' activities while they were working on the created worksheets. First year students from high school experimented following the created worksheets and they were recorded on the video during their work. We used codes to describe and differentiate the activities in the videos and we studied their distribution afterwards. From the recordings we then obtained information about the students' activities during experimentation at different levels of IBSE.