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Orientations to Studying in Engineering Education and their Relations to Study Engagement and Well-being

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When students enter the lecture halls and laboratories, they entertain various kinds of conceptions in their minds. For instance, they may differ in terms of how they think about learning and knowledge. We investigated what kind of student groups can be identified on the basis of students' motivational strategies and conceptions of learning and knowledge. These variables, when clustered into orientations, have been shown to relate to students well-being and study success [1]. Their relation to study engagement is less clear. We wanted to see, what kinds of orientations could be identified in electrical engineering students by using cluster analyses. Further, it was of interest, whether such clusters of students would differ in terms of study engagement and well-being.

The context was electrical engineering, and the participants were Bachelor students ($n = 224$) at Aalto University School of Electrical Engineering. The students filled in a questionnaire in the beginning of the spring semester 2012. The majority of the sample was of first and second year students. Furthermore, they were from five different courses in the Degree Programme of Electronics and Electrical Engineering. The questionnaire [2, 3] measured study engagement, motivational strategies, and epistemological beliefs. The data were analysed with quantitative methods, and cluster analysis and analysis of variance (ANOVA) were conducted.

We identified three clusters of students, labelled as *dysfunctional students*, *theorists* and *reflective professionals*. "Dysfunctional students" were the least optimistic, appreciated certain and practical knowledge and were not interested in reflection. "Theorists" scored high on optimism and they emphasized the value of reflection. "Reflective professionals" were optimistic, appreciated certain and practical knowledge but were also interested in reflection. It appeared that "dysfunctional students" expressed the lowest levels of study engagement and well-being. Our further inquiries shall reveal, whether different student groups vary in terms of learning outcomes in the context of electrical engineering. Likewise, our aim is to study how different student groups experience their learning environment. They may react differently in new educational innovations in engineering. ■

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