

An Empirical Study Of Introductory Lectures In Informatics

Abstract:

Before carrying out an empirical study in the area of didactics, one has to clarify the quantity to be measured. Often it is measured to which extent a student has acquired the basic concepts of the respective field; for example, the mathematical part of the PISA-study defines the modelling abilities of the students as the basic concept to be measured. However, in Informatics this is a problem, since the question of the basic concepts is still discussed controversially. This paper first proposes a taxonomy for the definition of both conceptual and didactical measurable quantities and then discusses the results of the study.

Four introductory lectures in Informatics are analysed by discussing the learning targets of these lectures. Afterwards, these learning targets are related to the fundamental concepts proposed by Schwill. The result is a sequence of basic concepts representing one dimension of the taxonomy. The other dimension categorises the complexity of the problems. This two dimensional matrix of categories is the basis of the analysis. Each element of this matrix represents a measurable quantity.

The individual problems of the final examinations of the above mentioned lectures are categorised using this two dimensional taxonomy. Therefore, each measurable quantity of the matrix is related to a number of problems.

Using the marks the students achieved in the problems, a statistical analysis is carried out for each such measurable quantity. Thereby, the analysis is performed both for the students as a whole and for male and female students separately. A detailed discussion of the results completes the paper.

Major research findings:

- The definition of measurable quantities to evaluate lectures in Informatics
- The evaluation of lectures in Informatics according to these quantities for
 - the students as a whole,
 - male and female students.

Overview of the research project: This paper results from the evaluation of four introductory lectures in Informatics, held from 2000 to 2004 at the Technische Universität München. The data collection, statistical analysis and interpretation was done by the author of the article.

Literature:

Schwill A.; Fundamentale Ideen der Informatik, Zeitschrift für Didaktik der Mathematik, 1993/1

Artelt et al.; Pisa 2000, Zusammenfassung zentraler Befunde, Max-Planck-Institut für Bildungsforschung, Berlin 2001