NEW STATISTICS: Elements for blended learning

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1. Background

In the project NEW STATISTICS we are creating a multimedia-based and web-supported virtual learning environment for basic studies in statistics. Statistics as an academic discipline is often considered as boring and hardly comprehensible by the students. Our basic approach is to establish a different, more explorative way of teaching and learning statistics in German universities. The learning environment NEW STATISTICS is designed in order to be used in different academic disciplines like economics, social sciences, medicine and geography. Therefore, CeDiS (Center for Digital Systems) cooperates with partners at 13 academic institutes and 10 German universities.

2. New Statistics

We believe that the quality of the statistical education in particular can be improved by the blended learning approach. Blended learning is an educating method, which connects e-Learning with the traditional instructor-led classroom interaction. This kind of "method-mix" offers the possibility to combine the advantages of both worlds: the directness of face-to-face support and social interaction in the classroom and the flexibility of web-based learning. The learning environment NEW STATISTICS has been developed to enrich the existing educational methods with new multimedia-based, interactive material. NEW STATISTICS is built upon five pillars: learning modules, case studies, flash animations, java applets and the statistical laboratory.

Learning modules contain the basic concepts of descriptive statistics, probability theory and inferential statistics. They also include various components like examples, exercises, illustrations, links and other resources.
Case studies deal with realistic statistical problems and are developed for different academic disciplines like economics and medicine.
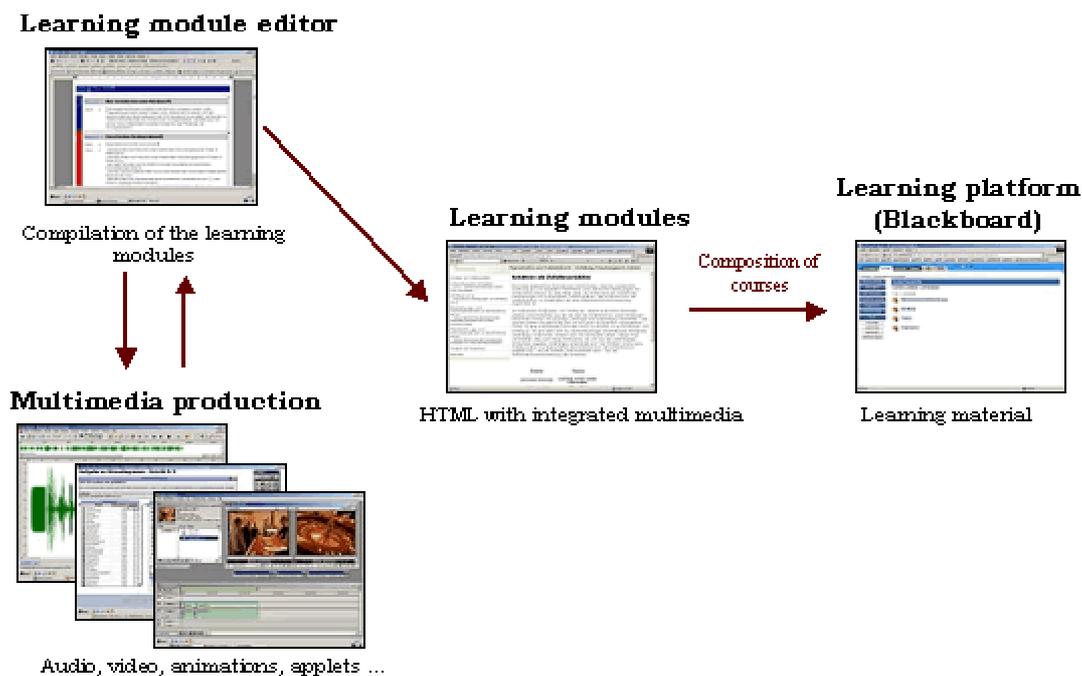*Flash animations* visualize specific statistical issues and make them easier to understand.
Java applets are interactive statistical experiments which also visualize specific statistical issues.
The Statistical laboratory is one of the most important elements of NEW STATISTICS. The laboratory is an interactive and explorative application based on the statistical programming language R. The laboratory enables an authentic, problem-based approach to statistical methods.

3. Production process

The NEW STATISTICS content is produced by 10 distributed working groups. The authors compose the learning modules with the "learning module editor", a tool we have developed based on MS-Word. CeDiS and the University of Hagen produce the multimedia material according to the concepts prepared by our authors. After generating web-based learning modules with the editor, they can be composed to personalized courses. Specific concepts, case studies and examples can be exchanged by the instructors according to the main focus of the course or for different academic disciplines. In this way, instructors are free to arrange their courses individually.

Learning module editor

Compilation of the learning
modules

Multimedia production

Audio, video, animations, applets ...

Learning modules

HTML with integrated multimedia

Composition of
courses

**Learning platform
(Blackboard)**

Learning material

4. Learning scenarios

The elements of NEW STATISTICS are already in regular use in courses with hundreds of students at several German universities. At the Universities of Bielefeld, Nuremberg, Hamburg, Berlin and the European-University Viadrina in Frankfurt/Oder the NEW STATISTICS material is in use in blended learning scenarios: Java applets, animations and the statistical laboratory are being used for visualization purposes in face-to-face courses. Assisted by supervisors in "multimedia tutorials", students learn to work on complex assignments and solve statistical problems with the statistical laboratory. Within our learning platform "Blackboard" the NEW STATISTICS material is available to students for preparations and self study purposes. Several other types of educational settings can be put into practice with the NEW STATISTICS material at further interested Universities.

REFERENCES

The project NEW STATISTICS: http://www.neuestatistik.de (only German)

RÉSUMÉ

Au sein du projet "La Nouvelle Statistique" nous sommes en train de créer un environnement virtuel d'étude basé sur Internet, environnement comprenant l'ensemble de l'étude de base en matière de statistique. "La Nouvelle Statistique" regroupe différents éléments d'étude interactifs basé par multimédia tels que modules d'étude, cas pratique, animations flash, applications java et le laboratoire statistique. Ces éléments ont été développé afin d'établir et de pratiquer une facon plus explorative pour enseigner et apprendre la matière statistique et pour faire en sorte que le "blended learning" puisse s'établir. Les matériaux développés par le projet "La Nouvelle Statistique" font déjà partie intégrante de l'éducation universitaire dans diverses universités allemandes.