

## STATISTICS EDUCATION AND BULGARIAN MANAGEMENT TRAINING INSTITUTIONS DEVELOPMENT PROJECT

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*This paper introduces the realization of the Bulgarian Management Training Institution Development Project in the Faculty of Economics, University of Veliko Turnovo: the aims and objectives, methodology, specific outcomes, and investigation of students' opinion. Developing statistical education for business-students, we focus on using the Internet as an agent of socialization of statistical information, specifically in the context of the Bulgarian situation. Analysis of teaching in the distance module "Statistics in Internet" shows that students do not have appropriate computer skills. We discuss importance of improving computer facilities and using computer based approach for training students in how to apply their statistical knowledge and literacy.*

### INTRODUCTION

The Bulgarian Management Training Institution Development Project is a joint project of Department for International Resource Development of British "Know How" Fund and four Faculties of Economics in Bulgarian Universities. As a contractor of the above project, Professor Nigel Healey, Head of Department of Business Studies, Faculty of Management and Business, Manchester Metropolitan University, invited lecturers in Statistics, Quantitative Methods and Econometrics to visit his university as representatives of the Faculty of Economics, University of Veliko Turnovo 'St. Cyril and St. Methodius'. Assistant Professor Nadezhda Tsankova as a visiting fellow, and her mentor Professor Stephen Bainbridge (responsible for the coordination of the undergraduate program at the University of Veliko Turnovo) together prepared an action plan for the period of the visit and for three years, 1997-2000, joint work. As we wrote in the Report of Visiting Lecturers (Tsankova, 1997):

The plan gave the following:

1. Aims
  - To improve teaching methods on the B.Sc. Business course in UVT.
  - To develop appropriate curriculum for business students.
2. Objectives
  - To develop teaching materials and learning activities for a first level statistics course.
  - To develop and adapt practical examples and cases for use with statistical software.

The methodology for achieving the above objectives included: using lecture schedules (course overviews), reading lists (recommended reading) of subjects and materials (lecture notes and examples), which were found on the students network and were recommended by the mentor; preparing lists with textbooks, chosen from Free Press Books Catalogue - Business & Management and the last catalogue of Portland Book Shop, which were bought for the project and library of Faculty of Economics, UVT; adaptation of English philosophy of teaching methods to the Bulgarian plan of education; using the student version of statistical packages SPSS, Minitab, and Statgraphics to teach statistics with computers.

As specific outcomes Professor Ivan Stojkov published two textbooks "Statistics" and "Quantitative Methods for Management", Nadezhda Tsankova published the booklet "Statistics in Internet" - the guide for practical training in statistics with available statistical education resources and statistical information in the Metanetwork and prepared computer exercises, case studies and examples. Professor Baiko Baikov, Dean of Faculty of Economics, Professor Alexander Dimitrov and Assistant Professor Nadezhda Tsankova equipped the Computer Laboratory for Business Modeling, available to students.

In developing statistical education, participants in the project realized that the main problem in their joint work is negative thinking. Students, administrators and many lecturers frequently view statistics as the worst course taken in the university, so the author investigated their opinion in an attempt to develop their statistical literacy and change their motivation. This report will focus on the adaptation of English teaching methodology to the Bulgarian plan of education and will discuss teaching statistics using the Internet and computers.

#### THE BULGARIAN SITUATION

Irrespective of good tradition, reform of statistical activities in Bulgaria and reorganization of the National Statistical Institute in transition, “there is not adequate socialization of statistical information in the country” (Nikolov, 1997, p.129). It is the main reason for negative thinking about statistical education. Students usually do not understand the importance of Introductory Statistics, which provides grounding for other courses included in the bachelor curriculum of the Faculty of Economics. Courses like Quantitative Methods for Management, Econometrics, and Research Methods for Business and Marketing are based on useful statistical knowledge and skills, which students learned in the first level statistics course.

The first teaching year of the project was 1998/1999. In this year only 96 students (42.29%) attended the first two lectures and tutorials. Investigation of their opinion showed that only 43.75% of them thought that Introductory Statistics gave theoretical preparation and a working knowledge. For 39.58% of students, Introductory Statistics is a preparatory course and it is not very useful, but 8.33% of their colleagues believe that they will earn prestige through learning statistics. Students do not think that statistics provides knowledge of life. Inquiry into students’ preparation for the statistics examination showed that 52% of students use their lectures and textbooks written by their lecturer/tutor; 12.5% of students use a study guide, and 1% of them are interested in using Internet resources for an interactive statistical education and periodicals of National Statistical Institute. Students find it very difficult to use English statistical textbooks and realized that the Faculty of Economics have to improve computer facilities. Business students need a computer lab; links to the outside world via Internet and access to different software packages that the student community can use.

#### STRATEGY FOR IMPROVING STATISTICAL EDUCATION

The first step towards improving the first level statistics course was to present statistics as a useful and interesting topic. We began with using a theoretical approach together with a workshop approach. Staff of the Faculty prepared a new lecture schedule (course overview), including fifteen lectures and tutorials, which cover: Data and Statistics, Descriptive Statistics, Probability, Sampling and Interval Estimation, Hypothesis Testing, Analysis of Variance, Regression Analysis, Forecasting, and Decision Analysis. Two of the tutorials (eight teaching hours) were held in a computer lab, where students used a student version of the statistical software package “StatGraphics” to explore statistical procedures and to illustrate the concepts. Here they analyzed real life examples and data and resolved case studies on their own with minimum guidance from their instructor. The following year we offered a very new textbook “Statistics”, written by Prof. Ivan Stojkov.

The second step towards improving the first level statistics course was to use the Internet in statistical education as an agent of socialization with three very important characteristics for our joint project. This agent is global, interactive and above-nationality. We applied the experience of mentor Prof. Stephen Bainbridge, who keeps links to his students via the Internet and encourages them to use the available resources for statistical education on the Internet. We use the Internet as a mass medium, because, in the words of Vulkanova (2000), it “plays an important role for socialization in two aspects:

1. When it is a basic information resource
2. When it participates in social attitudes, perceptions and shaping of views.” (p. 123)

In the next teaching year 2000/2001, by including “Statistics in Internet” in the curriculum like a distance module, we made an attempt to resolve the problem of negative thinking and to improve students’ statistical literacy. The module is a part of university course in Statistics and a guide for statistical training with the Internet for users of statistical data and

available resources on the Internet for the teaching of statistics. It can be very useful for the purpose of life-long education. The booklet "Statistics in Internet" (*The guide for practical training in statistics with available statistical education resources and statistical information in the Metanetwork*) is a first guide for statistical education resources on the Internet for Bulgarian students. The first chapter of the booklet is an introduction to resources as lists of links, web sites of national statistics and international institutions, statistical packages, applets, electronic textbooks, Internet courses and databases. The second chapter introduces statistical information of the National Statistical Institute and research agencies. In this chapter are included worked examples and self-assessment questions using statistical information available on the Internet to solve problems. There are many notices about the latest trends in the information market, the quality of statistical information offered by national statistics like an end product, the criteria for representativeness, and how to use sample surveys. The author thinks that the booklet assists in the success of the socialization of statistical information using Internet as a means of innovation of society.

The next step was to adapt the module "Statistics in Internet" and include a two-hour tutorial in "Organization and Management of Small Scale Business", a course for managers of a small-scale business. This course was organized by "Center of Requalification and Social Adaptation" - Veliko Turnovo and German Foundation "Hans Zidel". In this way we continued the statistical education of business students who attended the above course, and helped participants to improve their statistical literacy.

## RESULTS

Analysis of students' papers showed that approximately 23% of students were not interested in the booklet "Statistics in Internet" and did not solve a case study. 70.7% of students chose their own cases and provided their own interpretation of statistical information and comments. 6.3% of students only downloaded the chosen article or data, but didn't make any comments or do any analysis. Sources of statistical information that students used are shown in Table 1.

Table 1  
*Sources of Statistical Information Used.*

	Number of students that used this source
National Statistical Institute	106
Vitosha Research	17
GALLUP-BBSS	8
Agency for Economic Analysis and Forecasting	3

The most interesting for students were statistics of unemployment/employment, households, demographic trends (vital statistics) and corruption indexes. Inquiry into students' opinion of the distance module "Statistics in Internet" showed that 97% of students think that this module is a necessary innovation and 86.75% of them will recommend the booklet. Only 25.3% of students read the booklet. They were interested in statistical education resources. The booklet was bought by 13.86% of students, who will use it in the future. Other students (61.44%) were interested in the second chapter, in cases and statistical information in the Internet. Very important was the fact that 16% of students, in solving their case, accessed the Internet for the first time. 54.22% of students needed to improve their computer skills. Many of them (30.12%) used the help of computer specialist. Only 9.04% of students have consulted a statistician about their analysis.

We include the distance module "Statistics in Internet" in the curriculum, but don't improve computer facilities. Students don't have access to the Internet in the University. Many students did their cases in Internet Clubs in the town (69.88%), 23% of students used their home computers or home computers of their friends, 2.4% used the computer club with Internet access to UVT, and in the library of UVT did not work for anybody. We were not ready to realize our idea. Improving computer facilities has to be a very important part of our strategy for developing

statistical education. Many students (91.95%) think that the Library and computer lab of the Faculty need new computers, linked to University network and to the outside world via the Internet. As explanations for bad facilities, students suggested: unsuitable spending of money (56.02%), the wrong attitude to statistics as a subject (11.45%), and the wrong strategy for the development of Faculty of Business of UVT (41.37%). Almost all students (98.8%) think that it is very important to work with new versions of statistical packages. Something more, there are potential students for correspondence courses, who have completed their diplomas and are interested in advanced methods. They work in various companies and try to solve real problems. These students often find the procedures of statistical packages on the Internet useful, and need some tutorials in using it.

#### CONCLUSION

During the three years the Bulgarian Management Training Institution Development Project developed strategy and methodology for achieving the objectives of improving the statistical course. We developed an appropriate curriculum in introductory statistics, offered a new textbook in statistics and distance module "Statistics in Internet" to students of the Faculty of Economics. At the end of the project we realized that the main problem, specific to the Bulgarian situation was overcome. Improving computer facilities will be the next step in developing the above course.

#### DISCUSSION

To train business students with base statistical knowledge and appropriate statistical literacy to apply in their future practice and life, we need to improve their computer skills. The computer-assisted approach is very important for students' learning. Without the skills of working with statistical packages, statistical education resources and statistical information, it will be very difficult for students to do research and apply their statistical thinking in real life.

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