

Virtuální případové studie v distančním vzdělávání

Virtual Case Studies in Distant Education

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Abstrakt v češtině:

Virtuální případové studie (VPS) jsou založeny na principech simulace a podnikových her. Student může vstoupit do děje případové studie, zvolit si svoji roli v řešitelském týmu a ovlivňovat průběh řešení. Učitel může měnit texty a data a upravit PS pro jednoznačně určenou pedagogickou situaci. Texty doprovázející problém v PS jsou bohaté, mají literární úroveň, kromě vlastního problému zahrnují i sociální, kulturní, etnické, ekologické prvky. V průběhu řešení se uplatňují prvky hry ("work and fun"). Základem dynamické a flexibilní studie jsou čtyři báze (problémová, datová a modelová, story a simulační) propojené scénářem. Dynamika případové studie je zajištěna matematickými modely: simulace v tabulkovém procesoru, rozhodovací stromy, vícekritériální lineární programování, modely hromadné obsluhy, aj. PS vyžadují multimediální podporu, student je dostává přes Internet nebo CD.

Abstrakt v angličtině:

Virtual Case studies (VCS) are based on simulations and entrepreneur games. The student is involved in the problem and motivated and/or educated by a means of multimedia support. Problems and the environment are presented by video/audio/Internet means. The student can personally influence the behaviour and evolution of the process. Simulation techniques and principles of business games are used for this purpose. The student can choose his/her role in the process and can also change it while performing the solution. He can be a manager or advisor or observer. Social, cultural and traditional values are respected during all steps of the solution. Also, the mobility of young people, internships and vocational training in a company is a part of the story. Ecological aspects and conditions of sustainable development are taken into account when solutions are analysed, recommended and accepted. Information technologies and modern analytic quantitative methods are used as much as possible in all steps of the solution. Multimedia support is used to induce elements of play and fun into educational process in order to motivate the student and make study easier. Case studies are flexible and can be easily adapted to a new situation/problem according to pedagogic needs; the actors can be changed, the environment can be modified.

Klíčová slova:

Virtuální prostředí. Případová studie. Distanční vzdělávání. Práce a hra. Simulace. Podnikové hry. Matematické modelování. Multimediální podpora vzdělávání.

Keywords:

Virtual environment. Case study. Distant education. Work and fun. Simulation techniques. Business games. Mathematical modelling. Multimedia support of education.

Úvod:

Development of a new generation of case studies in virtual environment is a challenge facing the needs of the Information Society. Case studies (and not only case studies) will be permanently developed and improved according to the development of information technologies and humanities. The paper solves one small, but considerable and interesting part of many problems occurring in the tertiary sphere of education. Results can be instantly used in all levels of both present and distance learning, and in special training courses due to the possibility to derive variants and change frame, design and content.

Virtual Case studies (VCS) are developed at the department of Operation Research and System Analysis, Faculty of Economics and management, Czech University of Agriculture Prague as a part of the a grant afforded by the Ministry of Education Czech Republic. They are created according to ideas:

Case studies are commonly used in each course, study book, lecture. They have enormous impact on study. First, they are used in introduction to the practical problem and involve student in the centre of the problem. Secondly, they illustrate application of theoretical knowledge to practice problems and also motivate the student to better understand and do work/study easier. Furthermore, case studies can be used throughout the entire teaching unit: can open the problem, can be used to close it, can be used during all steps of explanation and/or examination. Finally they serve as a model of "know how" for future practice.

Cíle a metody:

If we analyse the forms and contents of existing case studies, we can ascertain following weak points:

Case studies seem to be "black and white". Stories are purely optimistic or purely pessimistic contrary to real life, which may be grey.

The student/reader is a passive observer and cannot actively influence behaviour in the story. He cannot influence the process and change data or rules and get immediate appropriate feedback. The conventional form of case study is a written text with tables, graphs and pictures. The student is a passive user. The student cannot influence the process and change it according to his/her opinion.

Case studies are concerned with the main restricting conditions of a problem and do not consider and involve other social, cultural, gender and national impacts. Simply, case studies are self-centred. The student is involved in the problem without being disturbed and challenged by surrounding problems seemingly not pertinent to the core problem. Human factors are not involved.

Most case studies describe behaviour and action of rather big and very well known companies with the highest positions in the market. There is a lack of case studies which operate in middle management and deal with smaller business and low budgets and non profit organisations.

Solutions are most often unique and derived from feasible variants under one criterion. However, case study should prefer ways of multi-criteria decision making.

The stories are simple, more or less cold, and the same for all patterns of readers. They do not vary according to audience. No elements of play and fun are involved.

Case studies are presented in a rather static form and are not dynamic and flexible. The teacher cannot purposefully change the frame and design according to didactic needs.

Of course, a great many case studies are presented in form of video or film, today. Those visual means are used to better describe both the environment and process of solution. However, most of the weak points described above remain.

The methodology of Virtual Case studies (VCS) is developed by a co-operating team of professionals throughout departments of the University. VCS are created according to ideas:

- Student is involved in the problem and motivated and/or educated by a means of multimedia support. Problems and environment are presented by video/audio/Internet means.
- A student can personally influence the behaviour and evolution of the process. Simulation techniques and principles of business games are used for this purpose.
- A student can choose his/her role in the process and can also change it while performing the solution. He can be a manager or advisor or observer.
- Equal rights between women and men (gender problems) are illustrated during solution of the problem as a part of story.
- Social, cultural and traditional values are respected during all steps of solution. Also mobility of young people, professional stays and vocational training in company is a part of the story.
- Ecological aspects and conditions of sustainable development are taken into account when solutions are analysed, recommended and accepted.
- Information technologies and modern analytic quantitative methods are used as much as possible in all steps of the solution.
- Multimedia support is used to induce elements of play and fun into educational process in order to motivate the student and make study easier.
- CS are flexible and can be easily adapted to a new situation/problem according to pedagogic needs; the actors can be changed, the environment can be modified.

All methodological materials and sample case studies are made simultaneously in the Czech and the master language English in order to comply requirements of the future bilingual society and easy dissemination of all substantial results among potential foreign users.

Each case study consists of two components: case study is (1) an **example** and it is also (2) a **story**.

Being an example case study describes approaches using algorithms, formulas and rules in process of (i) identification of the problem, (ii) design of solving procedure and (iii) choice of optimal solution.

Being a story case study deals with living people: people work in teams, negotiate, act and live their own social life. Case studies describe the real world and real life and illustrate the student good or bad effects. The exact description of reality is the most consequential attribute of each case study.

Of course, case study is also a pedagogic facility and thus has to be adjusted and adapted agreeably to didactic objectives. Thus many simplifications are made, data are changed (some may be latent), real problems can be moved through time and space. There are many shapes of case studies. They vary across problems, methods, solutions and students.

Výsledky:

New generation of case studies should be dynamic and flexible involving principles of simulation and games. Four aspects of each case study must be analysed and relevant problems solved to realise this aim:

1. *Problem base*. Identification and selection a problem according to pedagogic needs.

2. *Data/Tools base*. Searching for data and information and selecting relevant tools.
3. *Story base*. Making out a story.
4. *Simulation/Game base*. Putting the scene in motion.

All four bases will be interconnected by a *scenario*. Simulation/game base will use mathematical models: mostly spreadsheets and (probability) decision trees. In more specialised problems will be used linear programming, assignment and transportation models, waiting line models, inventory models, Markov chains, forecasting models, computer simulation. One framework can be used for a set of relevant case studies. Teacher can change contents in Problem base, Data base and Story base. Student can enter the problem and influence the solution.

Examples of four model CVS are depicted in the Table 1:

	Scenario
Problem	ecological decision facility investment production personnel
Data/Tools	derived from existing case studies
Story base	oriented to "green" youth small business in a small town middle management regional office
Simulation/ game base	people live their own life, gender problems are involved, students stay and practice, multi criteria decision making approaches are used, complex system approach involving broad environment is considered ...
spreadsheets (Excel)	
decision (probability) trees	
linear programming	
weighting multi- criteria decision making (Saaty, Topsis, ...)	

Table 1: Examples of model CVS

Diskuse:

New generation of case studies can be used and/or adapted in broad areas of high and higher education, in regular and/or distance learning courses, namely in tertiary education. There is a large target group of potential users. The outcomes will have impact on the education system at the Czech universities, high and higher schools, at enterprises and advisory services and due to English parallel form at other interested universities and institutions abroad, involved in training of practicians and/or specialists. The methodology presented in the project is general enough, to be adjusted to distance study of other disciplines. There is possibility of further development in this area.

The final purpose of the project is to contribute to improvement of the general level of distant training. This should be attained through an advanced and efficient education and training system in the chosen area. Direct contribution to such an improvement of the case study, however, may be difficult, but its indirect evaluation may be possible. The following criteria/indicators can be considered to this intent:

- The knowledge of students during examinations should be better when using new case studies. This can be measured by marks.
- The students' and practitioners' opinion about the course involving new case study should improve. This information can also be easily estimated, because schools, including universities, keep informal relations with students and graduates.
- The interest of instructors in use of case study should increase. Accordingly should increase the number of special modifications derived from one general case study.

Presentation of case studies at CD, CDV and Internet should increase.

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