

Cost efficiency of decision analysis distance education

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Teaching decision analysis requires combining theory with decision support software. The paper takes an attempt to estimate cost efficiency of blended learning (b-learning) in the area of operations research and decision analysis. The b-learning is understood as partially replacing classroom hours with remote computer based education (e-learning). The results are based on our experience of running a web-based educational decision analysis software at Warsaw School of Economics. The cost estimation is calculated for a single-faculty economic university in Poland. The results show that the presented software allows to achieve educational goals at lower cost than classroom only approach, however large number of students is required to achieve substantial economies of scale.

Keywords: e-learning; operations research; cost efficiency

1 Introduction

Several Learning Management Systems (LMS) exist – both open source (e.g. Moodle, Sakai, Quali) and commercial (e.g. Blackboard, WebCT). Several research show that providing on-line educational materials and courses allows universities to lower the costs e.g. [1] and [3]. Rooij [3] performs a analysis of 58 papers and concludes that among reasons for open source LMS adoption important role have total cost of ownership benefits.

Existing LMS systems provide students with educational materials in form of HTML, PDF and multimedia files and help to organize the teaching process. However decision analysis teaching requires combining theory with a decision modelling/support software. In Division of Decision Analysis and Support at WSE we have developed a software platform for web-based delivery of educational decision analysis software.

The goal of the paper is to estimate the cost efficiency of decision analysis education support in blended learning model with the presented technological approach.

2 Distance education software and cost calculation

The software platform for web-based education analysis implemented in WSE was presented in [4]. The platform is implemented in Java and the design assumes that a small core is extended by a set of plug-ins – each plug-in providing a single decision analysis method. Plug-in-s can be provided by independent developers – contributors. Plug-in development is carried out along the Model-View-Controller (MVC) design paradigm. A *model* is an XML file with a definition of a standard form a decision problem. A *view* can be created with standard HTML extended by tags allowing to interact with the model. A *controller* can be implemented heterogeneously in different languages – at present Java and a computational language Gnu Octave are supported. Eleven plug-ins for the platform have so far been implemented (including LP, GP, QP, BIP AHP, DEA, STEM).

Increasing educational efficiency from university perspective requires to achieve educational goals with lower costs. Achievement of educational goals in decision analysis b-learning was verified in [4] through a survey carried among 234 students at WSE. The b-learning cost calculations will be performed on the single-faculty economic university model presented in [2]. The model assumes that a university is located in Poland and has 1500 students (300 per year) and 148 teachers. It is assumed that b-learning allows to reduce number of teaching hours and in result leads to reduction of staffing levels. Cost calculations results show that salary savings are higher than expected costs of running the software. Moreover the presented approach could highly benefit from economies of scale.

Conclusions

The results show that b-learning in decision analysis can lead to lower costs incurred by parties facilitating in remote education while not affecting educational goal achievement.

References

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