

THE DIMBI PROJECT – ADAPTING NEW METHODS OF TEACHING WITHIN INTENSIVE STUDY PROGRAMS

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***Abstract:** The purpose of this paper is to present and test the adaptation of new methods of teaching business informatics among students. The main research methodology used in this paper is analysis of students' opinions who participated in the first intensive study program within the DIMBI project. The practical implication of this study concerns the definitions of some recommendations for the second intensive study program. These recommendations are oriented towards better educational process, bridging theory and practice, easier professional realization of students. This paper is written within the Erasmus plus KA2 project "Developing the innovative methodology of teaching business informatics" (DIMBI), 2015-1-PL01-KA203-0016636.*

Key words: DIMBI project, new teaching methods, intensive study programs.

JEL Classification Codes: C10, C87, C88.

1. INTRODUCTION AND LITERATURE REVIEW

Traditional methods of teaching usually include a number of techniques to ease the educational process. In the due course of time a lot of schools are created, tested and adapted. Some traditional methods are based on tractability, others – on giving bonuses, others – on punishment. Some methods adapt giving "red stars" for nice behaviour and "black stars" – for bad behaviour. There are a lot of pedagogical methods to teach people. Some of them are rejected, others are still well accepted. Even though there is still a need for adapting new methods of teaching.

There are a lot of case studies and examples of teaching business informatics. The researchers in the DIMBI project have made a scientific research on the existing methods of teaching business informatics. The traditional ways of teaching include the description of the teaching methods in curricula. All these curricula usually use one and the same template. This is an obstacle and a restriction on the description of a discipline or a course and its implementation.

The purpose of this work is to present the DIMBI project, the idea behind conducting intensive study programs and to evaluate the opinions of students who attended the intensive study programs.

Several articles (Vasilev 2016; Atanasova 2016; Kuyumdzhiev 2016; Marinova 2016) are dedicated to the DIMBI project. They describe the current state of teaching business informatics. The authors of these articles prove the need of new teaching methods in the sphere of business informatics.

Since business informatics is a complex area, a lot of software products are studied (IBM n.d.; Foundation 2016; Neural Planner Software n.d.; Alyuda Research n.d.; RapidMiner n.d.). Some of them are proprietary software, others are – trial versions, others – free software. Some

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software companies provide free versions for educational purposes. That is why the focus of the used software is mainly on free, open source software and trial versions.

Studying opinions of students is a popular topic. A lot of researchers make surveys among students. In some cases (Carter et al. 2015) authors try to measure critical thinking of nursing and midwifery students. Other surveys (Pallant et al. 2016) among students are focused on testing well-known scales for specific measurement, e.g. the Practice Environment scale. A lot of internet addiction tests (Üneri & Tanıdır 2011; Panayides & Walker 2012) are conducted among students. In this paper opinions of students who have finished an intensive study program (within the DIMBI project) are presented.

2. INNOVATIVE METHODS OF TEACHING BUSINESS INFORMATICS

An intensive study program with students and professors from three universities (Wroclaw University of Economics, Uczelnia Jana Wyżykowskiego and University of Economics Varna) is conducted in Varna in September 2016 within the DIMBI project. New ideas about adapting innovative teaching methods are tested.

Several modules within the courses of “Data warehouse” and “Business intelligence” are included. The researchers from University of Economics Varna used one and the same dataset for all modules. The dataset is downloaded from IBM’s web site. The researchers also used the same business questions. The solution of the business questions is done within different software products. During the studies, several steps are followed:

- Firstly, an open source statistical software (PSPP) is used (Foundation 2016). Argumentation of the appropriate statistical methods is done (Pallant 2011). After that the dataset is analysed and interpretation of the output is done. Several remarks about the formulation of the result of the applied methods as part of scientific texts are made;
- Secondly, the Power Pivot techniques are shown to students. In several steps, grouping and summarizing of data is shown. Several milestones are described, concerning the correct economical interpretation of Pivot tables;
- Thirdly, data mining techniques in a spreadsheet are shown;
- Fourthly, the business questions are tested within two artificial intelligence software products: (1) Alyuda Neurointelligence (Alyuda Research n.d.) and (2) Rapid Miner (RapidMiner n.d.).

The researchers from University of Economics Varna have previous background in testing business questions with statistical and artificial intelligence software (Vasilev & Atanasova 2015). These approaches are tested within an intensive study program. Moreover, the researchers from University of Economics Varna have published several papers on the sales analysis.

Finishing the intensive study programs students have new skills for data analyses, data warehousing and business intelligence. Working with real datasets and real business questions, finding solutions, using several software products, give them more confidence in their future professional realization. Even though the mentioned positive aspects of the intensive study program in Varna, we have to bear in mind the opinions, estimates and assessments of students who participated in the intensive study program, carried out within the DIMBI project.

3. SEVERAL ASPECTS OF THE DIMBI PROJECT

Thanks to the rapid development of the information and communication technologies the world around us is constantly changing. The universities now must act as business entities and try to offer the best education possible – one oriented towards the practice. The link between theory and practice has become a very major point. Students should not have only theoretical

knowledge, but also practical experience and so-called soft-skills that are not currently taught in all universities. Soft skills include the ability to present in front of an audience, the ability to work in a team, to work in a multicultural environment and others.

The idea behind the DIMBI project is to analyze and test different methodologies for teaching business informatics in order to find out which is the most useful one for the students so they can have the necessary knowledge and skills to easily find a job after they graduate. The ranking of the methods (done in this paper) is based on the opinions and estimates of the students who have participated in this project.

The area of business informatics is chosen because of its dynamism. The requirements in this sector are constantly changing and students must always have the latest IT knowledge in order to be competitive on the labor market. According to the statistics, in Bulgaria there is a deficit of around 40 thousand employees in the field of IT alone. The overall number for Europe is greater – 1 million people are needed in the IT area [Darik News].

The first intensive study program (within the DIMBI project) is conducted in Varna from 16th to 23rd of September 2016. 15 students from Bulgaria and Poland have participated. Participants are currently students in Wroclaw University of Economics, Uczelnia Jana Wyżykowskiego and University of Economics – Varna. Professors from these universities also participated in the program. The general idea after testing and ranking the methods is that certain proposals will be made about how the teaching of business informatics can be improved as a whole process in order to be more efficient and more useful for students themselves.

During the first intensive study program, several aspects of the IT world are studied – databases, data warehouses and business intelligence. Other than the theoretical minimum, some software products are demonstrated during the practical classes:

- Microsoft Excel and its functionality for creating Pivot tables and charts;
- PSSP – software for statistical analysis;
- Pentaho – software for data integration and business analytics;
- PowerBI – software for business analytics;
- Alyuda NeuroIntelligence and RapidMiner – software products for data mining and pattern recognition.

These software products are chosen because they are widely used in practice.

Students have individual or collaborative tasks. Students are divided in three groups and have to create a web site (using the CMS platform Wordpress) that gives information about the DIMBI project, the participants in the intensive study program and their opinions. Students also have to create a page in the social network Facebook and to regularly publish information about the intensive study program.

4. OPINIONS AND ESTIMATES OF STUDENTS WHO PARTICIPATED IN THE FIRST INTENSIVE STUDY PROGRAM

For this part of the paper the authors have gathered some of the opinions of the young people – both positive and negative.

The **positive aspects** can be classified in the following way:

- *Ability to work in a multicultural environment* – according to most of the participants the DIMBI project is the first one in a multicultural environment – with people from different countries. This is a key point in the IT area because software companies are global and very often the employees that work for them are from different countries, so this is a very useful experience for the students;

- *Ability to work in a team* – the students say that the intensive study program helps them in developing their ability to work together as a team. Work in IT companies is done in teams. A whole project cannot be done only by one person, so this is another key ability that young people have to implement very well if they want to be successful after they graduate;

- *Development of soft skills* – the intensive study program also helps students to develop their soft skills which are essential for a successful professional realization. During the first intensive study program, they have the opportunity to work in a team, to express themselves and to present during an audience. These are skills that are, as said before, essential when working in the IT field in the XXI century;

- *Developing their language skills* – as previously mentioned, the world is now a global place. Language skills are very important for every individual. According to the students the program is very useful because it is a tribune for them to train their skills in English and to develop even further their knowledge;

- *Making a comparison between different teaching methods* – when studying only in one university in one country, it is very hard to make comparison between teaching methods used in different countries. Academic staff (from both Bulgarian and Polish universities) has participated in the first intensive study program in Varna (September 2016). The students say that it is very interesting for them to make a comparison, for example, in how disciplines concerning databases in their university are taught and how disciplines concerning databases are taught from a lecturer from another university. Other than that, it is also a very useful experience;

- *Meeting new people and future partners* – participants are extremely happy to meet international students. After the first intensive study program ended, all of them said that they met new friends with whom they can work in the future – for example, writing a publication together or participating as a team in the projects like Horizon 2020;

- *The use of easy to understand examples* – according to the students it is very helpful for them the use of the same examples in all of the software products. In this way, they are able to understand the teaching material in an easier way. They strongly recommend that this method should be implemented when studying different software products with common abilities.

The positive aspects of the intensive study program are summarized in fig. 1.

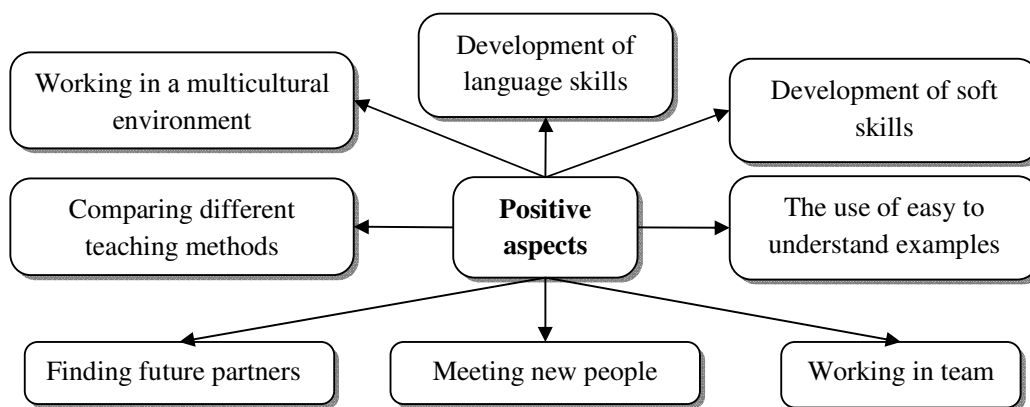


Fig. 1. Positives aspects of the intensive study program

In the beginning and in the end of the intensive study program the participants made the same test, so the organizers can evaluate their knowledge before and after the intensive study program.

The students also expressed some concerts and some recommendations how the intensive study program can be made even better.

According to students' opinions some of the **negative aspects** are the following:

- *Big presentations* – students say that big presentations (with many slides) are sometimes boring to the audience. According to them, instead, lecturers should use smaller presentations that are focused only on the main topics;

- *Too many theoretical concepts* – according to the participants only the main theoretical concepts should be taught. More of the time spent in the program and in the university as a whole should be dedicated to the practical use of software that will be related to the later work of the students;

- *Lack of interaction in some lectures* – students said that some of the lectures lack the interaction between the lecturer and the audience. According to the participants all of the classes in the universities, especially in the field of IT, should be in the form of discussion and Q&A (Questions and answers);

- *Organizational issues* – students had some trouble with the organization of the whole program because of the way it is conducted – they say that bigger breaks are required if transportation is needed. Also, there should be only one location per day. For example, during this program, during some of the days the classes are conducted in the morning at the university and in the afternoon – at the conference hall of the hotel.

The negative aspects of the intensive study program are summarized in fig. 2.

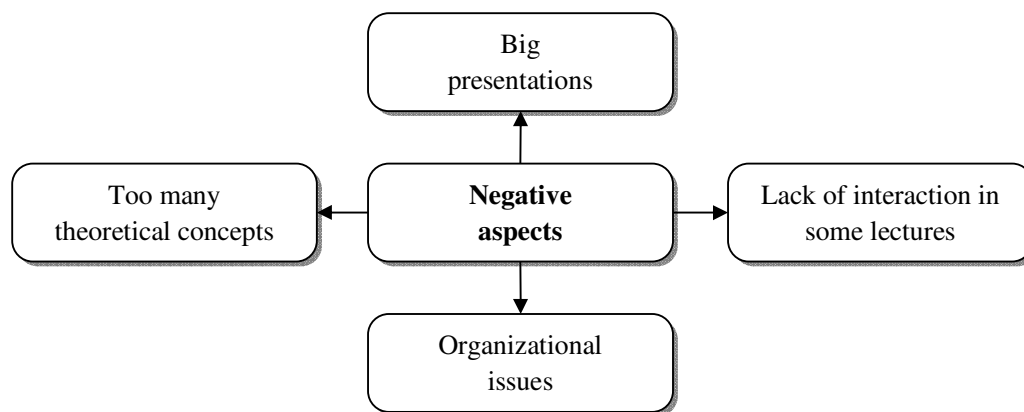


Fig. 2. Negative aspects of the intensive study program

Students are very glad they take participation in such kind of a project. They think that it is a very useful experience and helps them when they apply for a job in the future. Students hope that the tested methodologies of teaching business informatics will be truly implemented in many higher and second education institutions.

5. CONCLUSIONS

The aim of the DIMBI project is to adapt new methodologies of teaching Business Informatics. Within the project, an intensive study program is held with the purpose of testing new methodologies in order to receive feedback. An analysis of the students' opinion is made. The purpose of this analysis is to mark directions of improvement when organizing the second intensive study program.

Overall, the students think that the first intensive study program and these kinds of teaching methods together will help them to be more competitive in the labor market and to have the necessary knowledge and skills to make a successful professional career in the IT field. The concrete positive sides that the participants acknowledge are: ability to work in a multicultural environment, ability to work in a team, developing their language skills, making a comparison

between different teaching methods, meeting new people and future partners, the use of easy to understand examples and development of soft skills. Students also share some negative aspects: big presentations, lack of interaction in some lectures, too many theoretical concepts and some organizational issues.

Students' opinions from the first intensive study program in Varna (September 2016) mark several aspects for the academic staff participating in the DIMBI project. Positive and negative opinions help professors to improve teaching methods and test them during the second intensive study program in Wroclaw (January 2017).

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