ISSN 1507-3858
e-ISSN 2450-0003

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DIFFERENTIATION OF SUPPORTING METHODS OF BUSINESS INFORMATICS TEACHING OFFERED BY SELECTED EDUCATIONAL PORTALS*

ZRÓŻNICOWANIE WSPOMAGAJĄCYCH METOD NAUCZANIA INFORMATYKI W BIZNESIE OFEROWANYCH PRZEZ WYBRANE PORTALE EDUKACYJNE

DOI: 10.15611/ie.2018.2.04

Summary: Nowadays Internet technologies are becoming more capable of supporting traditional ways of teaching. Education portals in particular offer lessons in various domains as supportive means for experienced tutors to deliver knowledge to students. The aim of this study is to present the solutions offered by various educational centres and to analyse supportive methods of teaching. The paper presents. A discussion about the approaches to the formulation of a list of teaching methods supporting traditional lessons. The next part is devoted to an overview of selected educational portals offering courses in the business informatics area. Then the paper concerns the comparison of the applied methods of teaching which support classic lessons. The utility of particular methods in teaching selected courses is demonstrated and evaluated according to the defined survey assumptions. Finally, suggestions concerning the hybridisation of various supporting teaching methods are proposed.

Keywords: educational methods, e-portals, effective education.

Streszczenie: W dzisiejszych czasach technologie internetowe coraz częściej wspierają tradycyjne metody nauczania. Przede wszystkim portale edukacyjne oferują lekcje w różnych dziedzinach jako pomocne środki dla doświadczonych nauczycieli, którzy dostarczają wiedzę studentom. Celem niniejszej pracy jest przedstawienie rozwiązań oferowanych przez różne

* This research was performed as part of the DIMBI project and supported by funds of this Erasmus+ project.

ośrodki edukacyjne oraz analiza metod wspomagania nauczania. Artykuł przedstawia m.in. dyskusję na temat podejść do formułowania listy metod nauczania wspierających tradycyjne lekcje. Kolejna część poświęcona jest przeglądowi wybranych portali edukacyjnych oferujących kursy z zakresu informatyki biznesowej. Najistotniejsza część tego artykułu dotyczy porównania dodatkowych stosowanych metod nauczania, które wspierają lekcje klasyczne. Użyteczność poszczególnych metod w nauczaniu wybranych kursów jest przedstawiona i oceniana zgodnie z określonymi założeniami ankietowymi. Na koniec zaproponowano sugestie dotyczące hybrydyzacji różnych metod wspierających nauczania.

Słowa kluczowe: metody edukacji, e-portale, efektywna edukacja.

1. Introduction

Modern methods of teaching should be very attractive and effective in order to satisfy very demanding students (‘a good education should leave much to be desired’, Alan Gregg). Internet technologies create new opportunities in terms of the usage of unlimited resources as well as the differentiation of teaching methods. Many very positive results can be attained by applying computer systems to the dissemination of video lessons presenting difficult topics by experienced tutors. These traditional initiatives can be improved through the use of more active ways of delivering knowledge.

The starting point of this survey is a discussion concerning the enormous number of teaching methods listed on the educational portals or discussed in specialised papers [UNC Charlotte 2017; Mykrä 2015]. Some of these methods are associated with very specialised topics, while others can be identified with more global and universal approaches.

On the other hand, we may find selected teaching methods available on the Internet. Very famous universities offer valuable educational materials on their portals. These are mostly limited to the presentation of selected issues; however, there is a natural tendency to prepare concise knowledge as a part of widely understood courses.

A comparison of the solutions applied on portals with a potential list of available methods enables the demonstration of various approaches to practical teaching through university portals. As a synthesis (following the definition of criteria for the comparison of existing solutions), the presentation of various educational solutions can be formulated.

2. Overview of teaching methods

Education as an essential sector of human activities is still evolving. The concept of lifelong learning confirms all endeavours in this area. Therefore through the ages people have tried to define innovative and appropriate teaching methods. According to Wikipedia,

(…) a teaching method comprises the principles and methods used for instruction to be implemented by teachers to achieve the desired learning or memorisation by

students. These strategies are determined partly by the subject matter to be taught and partly by the nature of the learner. For a particular teaching method to be appropriate and efficient, it has to be in relation with the characteristics of the learner and the type of learning it is supposed to bring about.

Teaching (or learning methods) can be presented using the concept of the Learning Pyramid (see Figure 1).

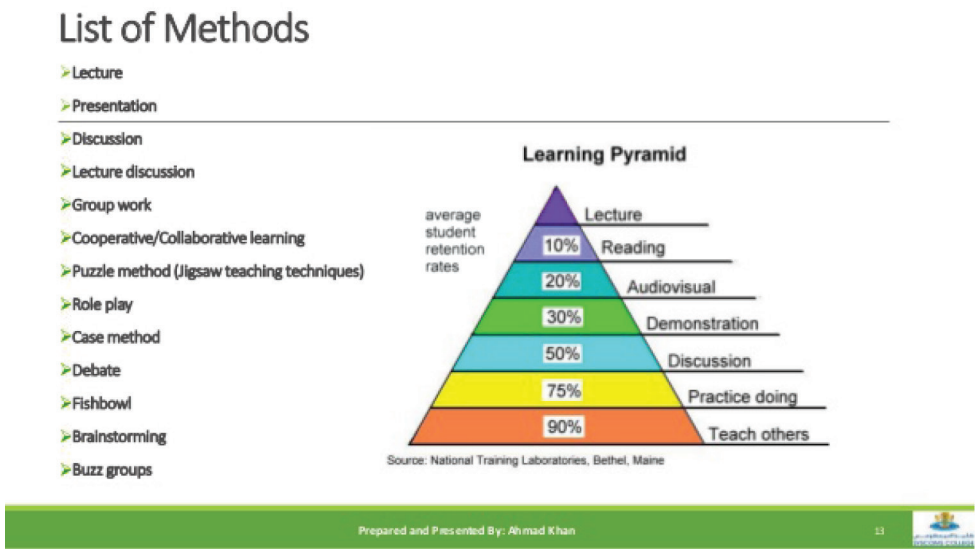

Fig. 1. Teaching methods supporting lessons

Source: National Training Laboratories, Maine.

Yet another approach focuses on the following group of methods:

- **instructor/teacher-centred** methods – where instructors play the leading role;
- **learner-centred** methods – where teachers are focused on students;
- **content-focused** methods – oriented towards delivering knowledge content;
- **interactive/participative** methods – where teachers try to motivate students in many ways.

Some researchers define teaching styles as a crucial element of more global teaching methods (Concordia TS). The following approaches can be enumerated:

- **Authority, or lecture style:** This traditional, formal approach to teaching is sometimes referred to as 'the sage on the stage'.
- **Demonstrator, or coach style:** This style retains the formal authority role while allowing teachers to demonstrate their expertise by showing students what they need to learn.
- **Facilitator, or activity style:** This approach encourages teachers to function as advisors who help students learn by doing.

- **Developer, or group style:** This style allows teachers to guide students in a group setting to accomplish tasks and learn what does or does not work.
- **Hybrid, or blended style:** This approach incorporates different aspects of the various styles above and gives teachers the flexibility to tailor a personal style that is right for their coursework and the students.

Additionally, it is worth stressing six famous and well-known teaching techniques (compare: [GoConqr TT; Ravi 2016]), including:

1. **Flipped classroom:** this basically involves **encouraging students to prepare for the lesson before class**. Thus, the class becomes a dynamic environment in which students elaborate on what they have already studied. Students prepare a topic at home so that the class the next day can be devoted to answering any questions they have about the topic. This enables students to transcend their normal boundaries and explore their natural curiosity.

2. **Design Thinking (Case Method):** this technique is based on resolving real--life cases through **group analysis, brainstorming, innovation, and creative ideas**. Although Design Thinking is a structured method, in practice it can be quite messy as some cases may have no possible solution. However, the Case Method prepares students for the real world and arouses their curiosity, analytical skills, and creativity. This technique is often used in popular MBA or masters' classes to analyse real cases encountered by companies in the past.

3. **Self-learning – curiosity is the main driver of learning.** As a basic principle of learning, it makes little sense to force students to memorise reams of text that they will either begrudgingly recall or instantly forget. The key is to let students focus on exploring an area which interests them and learn about it for themselves. A perfect example of a teaching technique based on self-learning was outlined by **Sugata Mitra at a TED conference**. In a series of experiments in New Delhi, South Africa, and Italy, the educational researcher Sugata Mitra gave children self-supervised access to the web. The results may revolutionise how we think about teaching. The children, who until then did not even know what the internet was, were capable of training themselves in multiple subjects with unexpected ease.

4. **Gamification:** Learning through the use of games is one of the teaching methods that has already been explored, especially in elementary and preschool education. By using games, students learn without even realising that they are learning. Therefore, **learning through play** or Gamification is a learning technique that can be very effective regardless of the age of the students. It is also a very useful technique to keep students motivated. The teacher should design projects that are appropriate for students, taking into account their age and level of knowledge, while making them attractive enough to provide extra motivation. One idea may be to encourage students to **create quizzes online** on a certain topic.

5. **Social Media:** A variant of the previous section is to utilise **social media in the classroom**. Students today are always connected to their social networks and thus **will need little motivation** to get them engaged with social media in the classroom. The

ways in which teaching methods can be used are quite varied, as there are hundreds of social networks and possibilities. A good example is the initiative carried out by the 'Red Balloon' Brazilian Academy of Languages, which encouraged students to review the tweets of their favourite artists and correct the grammatical errors they contained, in an effort to improve the students' English language skills!

6. **Free Online Learning Tools:** An array of free learning tools that teachers can use to encourage engagement, participation and a sense of fun into the classroom is available online. Teachers can create an interactive and dynamic classroom environment using, for example, online quizzes to test students' knowledge. Those who have not used **GoConqr's free online learning tools** yet can sign up at any time to create Mind Maps, Flashcards, Quizzes, Courses, and even **Flowcharts**.

To summarise, real teaching consists of teaching methods, teaching techniques, and a mixture of teaching styles. Therefore, the presented lists of teaching categories can be implemented, in particular 'teaching schools'. A survey on the potential implementation of the categories mentioned above is discussed in the next section.

3. Examples of teaching methods offered by educational portals

More and more universities around the world are investing in sharing knowledge online, but there are also non-university initiatives focused on free open educational resources. While it is possible to find a variety of courses linked to many different disciplines, our research is limited to courses connected with Business Informatics. All these courses are free; for full use of all course functions, the user must log into a portal account. Below are examples of free educational portals.

a) Massachusetts Institute of Technology: one of the world's most prestigious universities, MIT is a private institution, founded in 1861 and located in Cambridge, USA. The main specialisations at MIT, which is divided into five schools and one college,[1] focus on scientific and technological research [Wiki resources]. MIT boasts 85 Nobel Prize winners, 34 astronauts, and 52 National Medal of Science winners among its graduates [Wiki resources].[2]

On the main webpage of MIT OpenCourseWare, it is possible to use the search function to find a suitable course or choose one from a particular group of courses. Each course contains several kinds of materials, such as a syllabus with a detailed description of the course, reading lists with suggestions regarding the subject literature, lecture notes in .pdf and/or audio formats, and projects with a description of a practice case.

b) StuDocu is a global open study resource browser offering study documents for universities from all over the world. The service was created by Dutch students.

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[1] https://www.usnews.com/best-colleges/mit-2178.

[2] https://en.wikipedia.org/wiki/Massachusetts_Institute_of_Technology.

Fig. 2. MIT OpenCourseWare portal

Source: https://ocw.mit.edu/courses/engineering-systems-division/esd-57-technology-based-business-trans-formation-fall-2007/projects/.

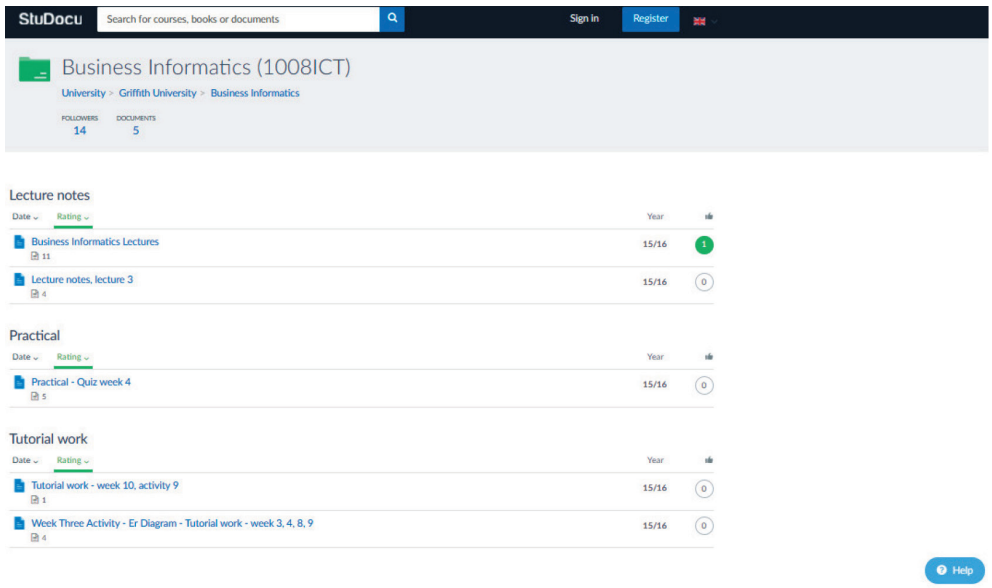

Fig. 3. StuDocu portal

Source: https://www.studocu.com/en/course/griffith-university/businessinformatics/241213?auth=0&-auth_prem=0&em=0.

Finding the proper course or materials can be done by entering keywords in the browser. In the case of a Business Informatics course, there are several kinds of materials such as lecture notes, some practical cases in the form of quizzes, and tutorials with descriptions of practical cases and problems to solve.

c) edX is an open online course (MOOC) provider, consisting of online university-level courses in a broad range of disciplines to students all over the world. Some of the courses are free. edX, created by the Massachusetts Institute of Technology and Harvard University in 2012, also conducts research into learning based on how people use the platform. More than 70 schools, non-profit organisations, and corporations offer or plan to offer courses on the edX website. As of 29 December 2016, edX had approximately 10 million students taking more than 1,270 courses online [https://en.wikipedia.org/wiki/EdX].

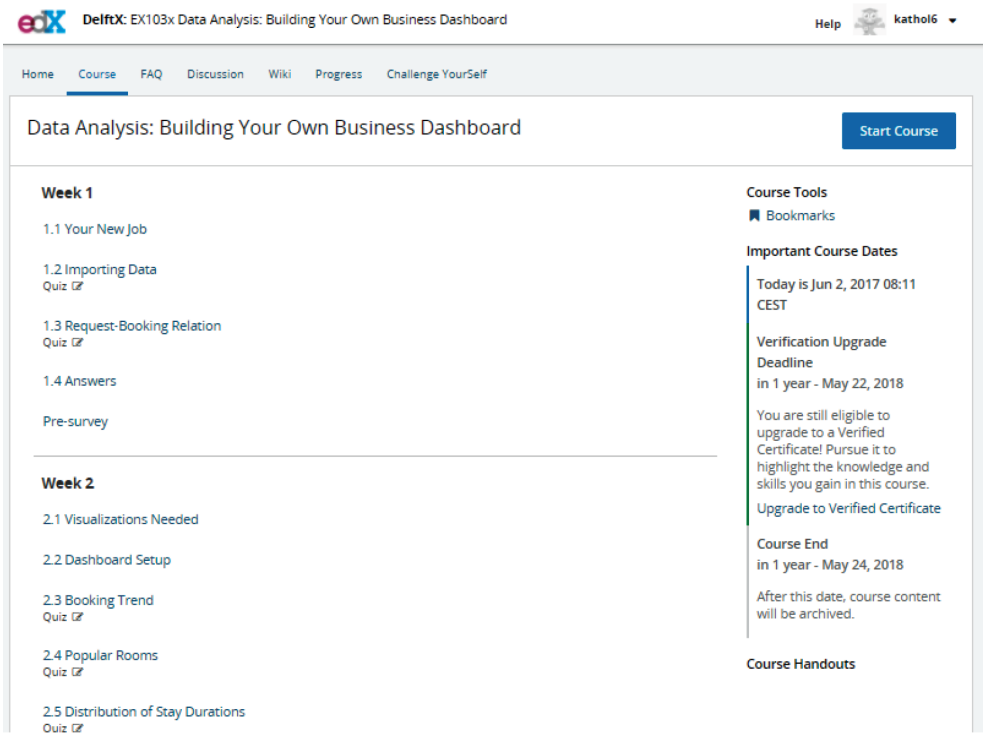

Fig. 4. edX portal

Source: [https://courses.edx.org/courses/course-v1:DelftX+EX103x+1T2017/course].

In the main menu one can find a list of courses. The material for each course is divided into weeks. Each course begins with a video tutorial, then includes some quizzes, case studies, and questions aimed at solving certain problems. There is also an opportunity to discuss some aspects and doubts at this level with others.

d) Harvard, founded in 1636, is one of the oldest institutions of higher education in the United States, as well as one of the world's most prestigious universities. Harvard's alumni include eight U.S. presidents, several foreign heads of state, 62 living billionaires, and approximately 130 Nobel laureates [https://en.wikipedia.org/wiki/Harvard_University].

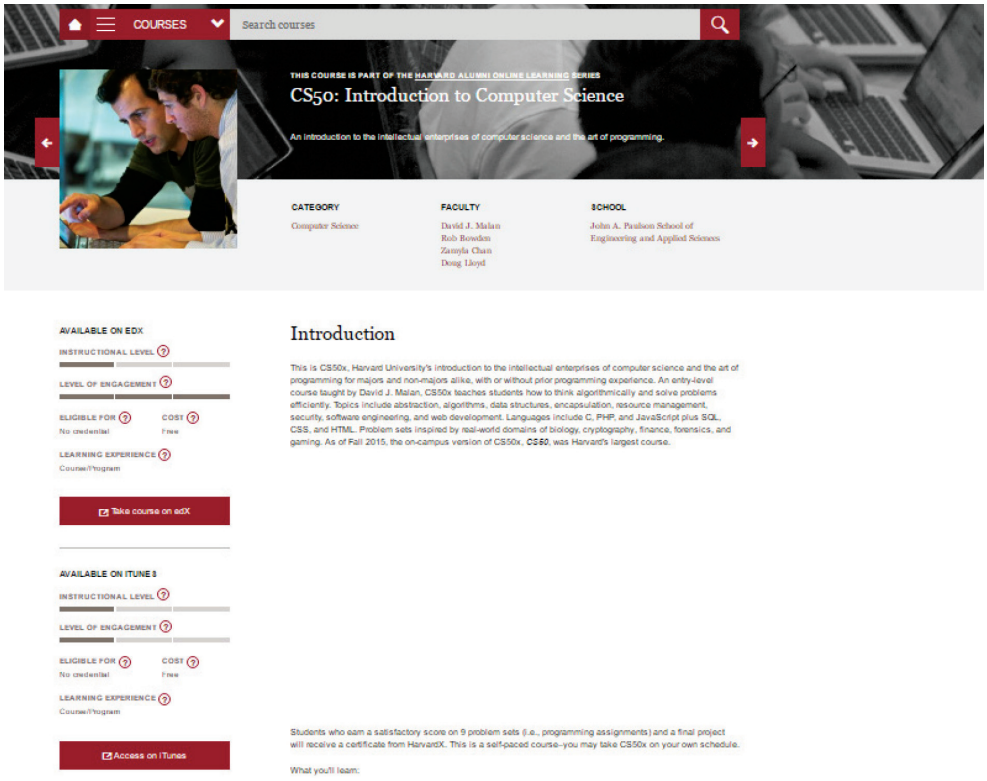

Fig. 5. Harvard portal

Source: [http://online-learning.harvard.edu/course/cs50-introduction-computer-science?category[]=3].

The main available material courses are video tutorials. Each course is divided into weeks. The videos include some problems to be solved. Students can always discuss the problems with teachers and other students, as well as using videos, notes, transcripts, and additional materials such as source code or slides. At the end of the course, there is a final problem to be solved.

e) Skillsoft is an American company focused on educational technology, producing learning management system software and content. It is one of the world's largest corporate training providers, with 10,000 customers, 60 million users, and 2,400 employees.

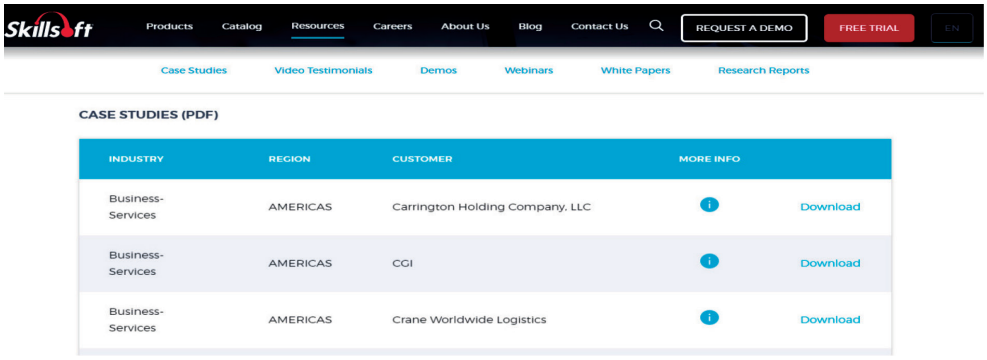

Fig. 6. Skillsoft portal

Source: [http://www.skillsoft.com/online-learning-resources/].

Users can choose various kinds of materials such as case studies, videos, demos, webinars, white papers, and research reports on the main web page.

f) DIMBI is an educational portal prepared for students interested in Business Informatics studies. The portal is a result of the '**D**eveloping the Innovative **M**ethodology of teaching **B**usiness **I**nformatics' project created within the Erasmus+ programme. In addition to typical lesson materials (presentation of the content of the lesson), there are various supporting materials, such as assignments, quizzes, chats, projects, examples of software tools, and the like. Individual scenarios based on so-called Active Books are available to students; for tutors, suggestions regarding teaching methodology are provided.

Fig. 7. DIMBI portal

Source: [http://dimbi.eu/].

All of the portals presented above differ in terms of the teaching contents they present as well as their applied teaching methods and techniques. In order to formulate more general tendencies in Business Informatics teaching, analysis of these solutions is necessary, including definitions of comparative criteria.

4. Comparison of applied teaching methods in educational portals

The portals offer individual ways to teach students. In most cases, solutions have been created and improved over a long period of time. Students differ, as do teaching staff, despite many attempts at unifying the learning process. In this section, an analysis of particular solutions focuses on the presentation of the methods and techniques available on the portals (Table 1) and course areas included in the offered study areas (limited to Business Informatics studies) (Table 2).

Table 1. Availability of different methods and techniques on the selected educational portals

Method/technique	MIT	StuDocu	edX	Harvard	Skillsoft	DIMBI
• Video lectures	+	+	+	+	+	–
• Flipped classroom	–	–	–	–	–	–
• Groupware	+	–	+	+	–	+
• Case method	+	+	+	+	+	+
• Social media	+	–	+	+	–	+
• Online tools	+	+	+	+	+	+

** Course will be developed*; *+ Course exists*; *– Course does not exist.*

Source: the author's own elaboration.

Table 2. Presence of Business Informatics courses on the selected educational portals

Course area	MIT	StuDocu	edX	Harvard	Skillsoft	DIMBI
• Management	+	+	+	+	+	–
• Business	+	+	+	+	+	+
• Economics	+	+	+	+	+	–
• Finance and Accounting	+	+	+	+	+	–
• Information Technologies	+	+	+	+	+	+
• Qualitative Methods	+	+	–	–	–	–
• Information Systems	+	+	+	+	+	+
• Programming	+	+	+	+	+	+
• Knowledge Management	+	+	+	+	+	+
• Data Warehouse	+	+	+	+	+	*
• Business Intelligence	+	+	+	+	+	*

** Course will be developed*; *+ Course exists*; *– Course does not exist.*

Source: the author's own elaboration.

Portal analysis demonstrates that the most commonly used teaching methods are video lessons, the case method, and online tools. Social media and groupware are popular methods connected mainly with academic portals; probably over time these methods will become more and more popular due to the intensive development of such platforms. The flipped classroom appears to be a more classic method; none of the presented portals use this technique. Of course, there are some cases in which students have to prepare certain tasks, but this is always preceded by theoretical content.

A very wide variety of courses is available on all of the presented educational portals, however, once again, the portals can be classified as more or less academic. Those with an academic basis appear to be more professional and are prepared by academic professors. Portals such as StuDocu and Skillsoft have an even wider range of courses, but the materials on these portals are prepared not only by teachers but also by students and other users. In addition, academic portals such as MIT, Harvard, and edX offer official certificates for successfully completing particular courses.

The earlier part of the article presented the teaching methods used in the field of selected educational portals. Probably additional research connected with teaching methods will focus on the needs and skills of certain students and the form of the course will be matched precisely to the students' abilities. To date, however, it has been difficult to match the teaching method to each course participant, and thus the main idea for the effective application of the course material is the use of a mix of various methods. This solution offers a more attractive form of teaching and increases the effectiveness of acquiring knowledge. The methods are supposed to be complementary, for example video lessons, which contain essential theoretical knowledge, can be combined with the case method which is more interactive, requires practice, and is associated with solving real problems. Similarly, the implementation of more active techniques (discussions, gamification, or design thinking) should improve the quality of education.

5. Conclusions

It is difficult not to notice that the change in the context of modern educational methods is not as impressive as in other fields. Nowadays students face more and more demands connected with educational programmes, conditions of learning, and originality of courses. Therefore this is the best moment to make up for lost time and focus on effective methods of teaching. Undoubtedly, modern education is changing with developing technologies – especially the Internet – which create new opportunities to interact with students. Nevertheless, the most popular teaching methods include lectures, presentations, discussions, group work, cooperative/ collaborative learning, the case method, and brainstorming. Thanks to the popularisation of the Internet, universities have started to create educational portals for their students, offering them permanent access to electronic materials such as

video lessons, notes, and case studies. Nowadays on the Internet one can find not only educational portals created by particular universities (e.g. MIT or Harvard) designed only for local students, but also those created by large groups of universities (e.g. edX) from around the world, which share their electronic materials with any interested user completely free of charge. In addition, free educational portals of this kind have also been created as a repository of know-how for a variety of disciplines (e.g. StuDocu and Skillsoft) as well as a base of knowledge in particular fields such as Business Informatics (e.g. DIMBI).

According to the research on educational portals:

- The most popular methods used are definitely case methods and online tools; this is probably because, thanks to the Internet, it is possible to use some real examples in practice and discuss them online.
- The most common courses in the fields of Business Informatics are: Business, Information Technology, Information Systems, Programming, and Knowledge Management. All of these courses are associated with modern technologies and, very often, special computer software; thus it is very common to practise the tasks described on on-line portals.
- The crucial problem was to classify the courses offered on educational portals. Very often similar courses bear different names, and thus the comparison was based mainly on their programmes and common topics. For future research it will be important to define courses precisely and establish the particular parameters shared by similar courses on a variety of educational portals.
- Another problem is connected with the authoritativeness of the materials provided to the users. The materials on university portals appear to be of better quality, order, and share a common structure; on the other hand, the materials from the other portals are more diverse and much more abundant.

Certainly there is still much to be done in the field of modern educational methods. Probably the next stage of research about this topic will concern the hybridisation of the existing methods and an attempt to determine which pairs of teaching methods are the most effective for students, and which of them is most commonly used by universities. Another interesting direction in the context of modern teaching method might be the use of the newest trends and technologies, such as Virtual Reality, which can offer an accurate simulation of how employees use software in their daily duties.

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