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BUSINESS COOPERATIONS ALONG THE SUPPLY CHAIN

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Abstract. Cooperation between and within the companies can be an important success factor. Based on trust, companies at present have created formal and informal network structures in which cooperation between them plays a special role. In the present times, the economic importance of supply chains can be observed in almost every industry regardless size: multinational companies and even small and medium-sized enterprises are actively involved in global value-creating chains. More and more business leaders recognize that when consumers are about to decide on their purchases, not just performance of a company is evaluated but that of the entire supply chain and supply network. Forms of cooperation in the supply chain affect the companies in several ways: we can investigate its impact on growth, operation and thus, on the effectiveness of the supply chain and competitiveness. Both cooperation between and within companies are important in creating the ultimate value added. This paper aims to explore the functional fields in which companies cooperate with each other, i.e. how and in what manner they are connected to each other. Results and conclusions are based on in-depth interviews and a questionnaire filled in by companies in Hungary.

Keywords: supply chain; supply network; cooperation; relationships; business strategy

JEL Classification: M10; F14

Introduction

Due to increasing competition and the continuously changing environment, the competitiveness of a company is influenced by many special factors (for example, size, innovation, financial situation) and also the connection with the enterprises in the supply chain network. Corporate cooperation has always played an important role both inside and outside the company. As Rigby (2017:5) perceptively states, "Over the past few decades, management tools have become a common part of executives' lives. Whether they are trying to boost revenue, innovate, improve quality, increase efficiencies or plan for the future, executives search for tools to help them. The current environment of globalization, rapid technological advances and economic turbulence has increased the challenges executives face and, therefore, the need to find the right tools to meet those challenges." There are a lot of management tools that are useful in helping company executives with leadership to be successful. According to an American consulting company's survey (Rigby, Bilodeau 2015), it can be stated that supply chain management has become the focus of thinking. According to Bala (2014:949) in the last years, "supply chain has moved up on the chief executive officer's list of priorities, but it is not always for the right reasons, in many cases, CEOs only pay attention to the supply chain when they want to cut costs or when something is wrong."

The aim of this research was to examine whether companies are aware of the importance of the field of logistics and how they cooperate along the supply chain, i.e. what are the most frequently used methods to keep connections and thereby we can also see how closely they are connected to each other and how much these independent companies are integrated into the supply chain.

More and more business executives recognize that consumers, when deciding on their own purchases, do not evaluate the performance of individual businesses, rather, they evaluate the performance and value added of the whole supply chain network. The overall performance of the supply chain is determined by the forms of cooperation within the chain, the balance of power within the chain and the power positions.

In the current economic environment, relatively few companies are able to operate competitively that does not take into account the direct or indirect external relations. Complex processes take place in the course of globalization when specialized companies engage in networks, and there are countless new challenges that are still waiting to be answered. At this moment, the most important question is how to provide a new competitive advantage for companies for which strategies and network concepts or management tools are available. Effective management and the coordination of paradigms given by new perspectives can enhance corporate efficiency and affect the current corporate practice, the tools required and the leadership/management reform.

The objective of this study is to explore the cooperation between the participants of the supply chain. In addition to the systematic analysis of Hungarian and international literature related to the topic, this study is also based on primary examinations.

Therefore, the paper is focused on introducing the key business processes of supply chain management and interpreting the structure of supply chain network from a theoretical point of view. The objective of the primary research was to demonstrate the cooperation and relationships that exist in the Hungarian supply chain network.

Literature Review

The continuous and rapidly changing environment has set new requirements for companies. Organizations face unique challenges in managing their supply chain by integrating their internal functions as well as the entire supply chain (Christopher, Jüttner 2000). From the value added perspective, the key internal processes include inbound logistics, operations, outbound logistics, marketing and sales and service (Porter, 2001). The key task in managing these functions is to ensure a process of interaction and collaboration in which they work together to achieve the mutual objectives of the supply chain.

From a supply chain perspective, we can define the key business processes of integration, from raw-material suppliers through end users that provide products, services, and information that add value for customers and other stakeholders. These are the following: customer relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, supplier relationship management, product development and commercialization and return management (Lambert, Cooper 2000).

While customers expect their goods to be delivered to the right place, at the right time, in the right amount, in the perfect condition and all at the lowest price, companies face difficulty with satisfying these demands individually. So, they have to closely cooperate with other companies. Cooperation can occur in different forms.

Cohen and Russel (2005) differentiated four models of collaboration (Fig. 1):

- Transactional — Efficient execution of transactions between partners
- Cooperative — Higher level information sharing
- Coordinated — Reliance on each other's capabilities
- Synchronized — Information developed jointly with longer horizon.

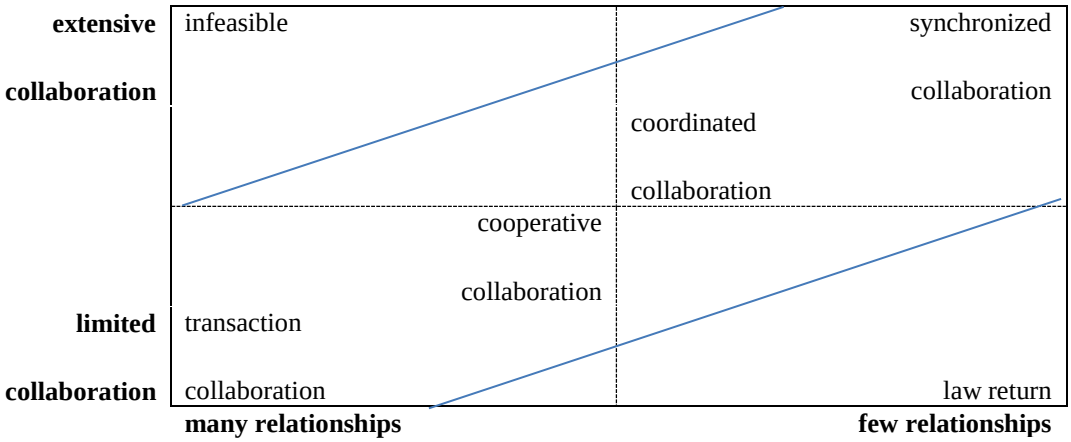

Fig. 1. Four basic models of collaboration: the collaboration spectrum (*Source*: Cohen and Russel, 2005)

To achieve more customer satisfaction, more profit and competitive advantages in the value-added supply chain, the following supply chain management strategies can be used by the companies: vertical and horizontal cooperation in a supply chain (Szegedi, Prezenszki 2003). Vertical cooperation means when a company expands its business into areas that are at a different stage of the value chain. Horizontal cooperation means when two or more companies in the same industry and in the same supply chain stage of production work together and produce or distribute the same products. The main goal of cooperation is a better economic situation for the members in the cooperation's practice.

Network-based business models are organizational structures that allow companies to operate as interconnected configurations across its value chain usually consisting of partnerships, collaborations and optimized cross-organizational activities (Mentzer 2008).

Supply chain strategy includes "two or more firms in a supply chain entering into a long-term agreement; the development of mutual trust and commitment to the relationship; the integration of logistics events involving the sharing of demand and supply data; the potential for a change in the locus of control of the logistics process" (La Londe, Masters 1994). Effective supply chain management requires an intra-corporate relationship between companies cooperating in the supply chain. The supply chain must be managed to ensure efficient operation. Improving the quality and efficiency of value-creating processes and managing the flow of material efficiently and economically can only be achieved through actual and relevant information. The right strategic tool for that is the use of information technology and management information systems.

According to Gelei-Nagy (2011), many Hungarian companies do not use any identification to manage their processes; most of the examined companies apply no standard codes but corporate-specific codes.

Mentzer et al. (2001:10) cite the definition of supply chain management as "the process of managing relationships, information, and materials flow across enterprise borders to deliver enhanced customer service and economic value through synchronized management of the flow of physical goods and associated information from sourcing to consumption."

The effective operation of the supply chain is influenced by the information shared by the actors, such as inventory, allocation status, sales, demand and production forecasts, sales promotional strategy and market strategy. However, Wong at al. (2015) found that information exchange among companies in the supply chain is not enough to satisfy customers' needs at a higher level. It is the IT-enabled collaborative decision making in the field of planning and managing inter-organizational activities that can really help. According to research carried out by Arantes et al. (2018), supply chain management has to be treated as a multidimensional concept where information sharing itself is only one of the factors that can determine the performance and not too high level of explanatory power was found for it. Trust,

partnership, cooperation or collaboration and coordination have to be taken into consideration as well, and altogether 79% of the performance can be explained by them. While sharing information, managers perceive several types of risks and try to mitigate them. That can influence the performance of the supply chain as well (Tran et al. 2016).

Methodology

We have been analysing the place and role of the Hungarian enterprises in their industrial supply chain for almost four years. Our analyses cover the following areas: the role of logistics in the company, its relationships with customers and suppliers, the presence of green logistics, expansion strategies along the supply chain and business supply chain management. When we were planning the scope of this research, we took into consideration our previous experiences and results and looked for companies that have logistic embeddedness. A questionnaire was created and sent to them to examine the following:

One of the aims was to investigate whether companies are aware of the importance of the field of logistics. To achieve this aim, we were curious in the questionnaire whether they had a separate strategy for logistics itself in the corporate strategy. If yes, the awareness can be confirmed and we can assume that this field is of a high importance for them. On the other hand if there is no separate strategy for logistics, but there is an organizational unit to deal with this field, we can also assume awareness in the company. In case of a separate strategy for logistics, separate organisational unit can be expected. The importance of this field can be indicated by the use of different IT systems too.

The main goal was that the most frequently methods/tools – used by companies to keep connections with each other – can be revealed. From these we can conclude how deep, i.e. strong, the relationships are and how much the companies are integrated into the supply chain. A five-level Likert scale was used when the questions were posed: "How important the use of the following techniques, methods and tools are in the cooperation in the supply chain?" The list of these methods was compiled based on answers given in one of our previous research for another question, and consisted of 19 items, such as EDI, bar codes, RFID solutions, vendor-managed inventory, cross-docking and so on.

It is worth considering how much these methods are related to the size of companies. The size, expressed either in number of people employed or in annual revenue, may explain the tools used most frequently. On the other hand, if we would like to state about the most frequently mentioned tools that they support the success in business, we have to focus on successful companies, i.e. companies that have been increased in headcount and/or revenue.

To evaluate the data collected by our questionnaire between April and December 2017 in Hungary, both descriptive and inferential statistic methods were used, for example, frequency and relative frequency distributions, crosstab analysis, chi-square tests and Wilcoxon signed-rank tests. After cleaning the database, 119 responses have been left in the database. The analysis, discussed below, refers to that number of companies unless otherwise indicated. If only a few questions have been left unanswered, the whole company was not excluded from the investigation but only from the evaluation of those questions.

The general characteristics of the sample are the following: as regards the size of companies (i.e., the number of employees), the sample consists of 41% big enterprises, 48% SMEs, and 11% micro enterprises (see Fig. 2).

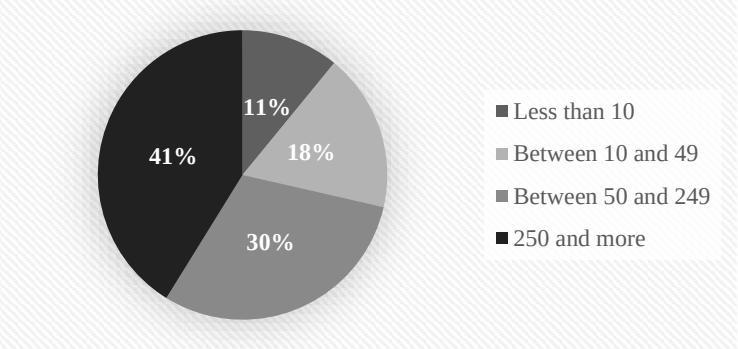

Fig. 2. Relative frequencies based on the number of employees in 2016 (Source: authors' compilation)

Companies filling in the questionnaire play a role in different sectors of the economy (see Fig. 3).

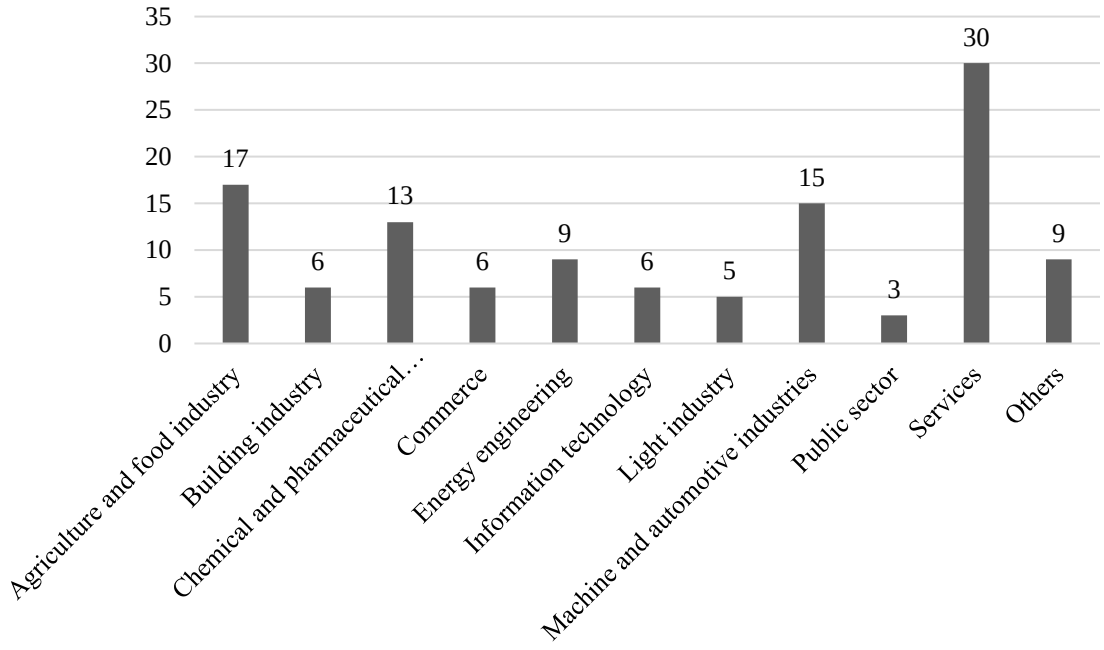

Fig. 3. Frequencies based on the sectors in the economy (Source: authors' compilation)

In the sample, the relative majority of the enterprises (38%) have a revenue of more than EUR 50 million (see Table 1).

Table 1. Frequency and relative frequency distribution of revenue in 2016 (Source: authors' compilation)

Revenue	Frequencies	Relative frequencies
Less than EUR 2 million	25	21%
Between EUR 2 and 10 million	23	19%
Between EUR 10 and 50 million	26	22%
More than EUR 50 million	45	38%
Total	119	100%

Here Cramers's V, whose value is equal to 0.55, can be used as a measure of association between the number of persons employed and the revenue. Based on this measure, only a middle-strength relationship can be observed between the variables mentioned above, i.e. the former attribute itself is too few to explain the latter one; however, it obviously plays a role.

Results

In the corporate strategy, there is a separate strategy for logistics itself in 55% (65 cases). There is a department as a separate organisational unit for logistics in 79%, i.e. 94 cases. ERP system with a special module for logistics is used in 72% (86 cases).

Interestingly, we can point out that where there is no logistics strategy, the probability is almost two times higher to have a separate organizational unit for logistics (19 to 35). If there is a logistics strategy, one may suppose that this field plays a very important role. But in five cases out of six, there is neither organisational unit for that nor an ERP system (see Table 2).

Table 2. Joint occurrences (Source: authors' compilation)

Separate organizational unit for logistics	ERP system with logistic module in use	Logistics strategy		Total
		No	Yes	
No	No	12	5	17
	Yes	7	1	8
	Subtotal	19	6	25
Yes	No	6	10	16
	Yes	29	49	78
	Subtotal	35	59	94
Total		54	65	119

Examining the use of ERP systems, it seems there is a relationship with the number of people employed, but it is only of medium strength (Cramer's V = 0.47). Interestingly, the Cramer's V shows the same strength (0.50) when ERP systems and the revenue is compared. In the machine and automotive industries, ERP system is always used and, with one single exception, we can state the same applies to the chemical and pharmaceutical industries.

Thirty-six percent of the companies use SAP, 2% LIBRA and 9% ORACLE. A relatively high number (78) of them use other or their own developed systems. The typical value for number of systems used is one (94 cases), but in 14 cases two systems were marked, three in four cases. In three cases, two systems are not even enough to satisfy all the requirements (see Table 3).

Table 3. Number of systems used (Source: authors' compilation)

The systems can keep track of all the processes	Number of systems used			Total
	1	2	3	
No	35	3	0	38
Yes	59	11	4	74
Total	94	14	4	112

In all the economic sectors, one is the typical number of systems applied. Thirty-five percent of the enterprises stated that the systems are not able to cover all the material flow processes, 14% say that it is not even important. In commerce, energy engineering, light industry and in the machine and automotive industries, there are no "No" answers for this question. In services, 30% say that it is not important, and that is the highest proportion that "No" could have reached. Regarding agriculture and food industry, 24% voted for "no." In other fields of economy only one case can be mentioned (except chemical and pharmaceutical industries, where it is two). Thirty-five percent of this total, 14% is microenterprise, another 35% is small, 18% medium-sized and 12% big enterprises.

If the number of people employed in 2016 surpassed that of the year 2013 and/or if the revenue in 2016 surpassed that of the year 2013, we consider the companies to be successful ones, i.e. they have grown during the years (see Tables 4 and 5)

Table 4. Change in number of people employed between 2013 and 2016 (Source: authors' compilation)

Employees in 2016 **Employees in 2013**	**Less than 10**	**Between 10 and 49**	**Between 50 and 249**	**250 and more**
Less than 10	12	3	1	
Between 10 and 49	1	17	7	
Between 50 and 249		1	28	7
250 and more				42

Table 5. Change in revenue between 2013 and 2016 (Source: authors' compilation)

Revenue in 2016 **Revenue in 2013**	**Less than EUR 2 million**	**Between EUR 2 and 10 million**	**Between EUR 10 and 50 million**	**More than EUR 50 million**
Less than EUR 2 million	24	7	2	
Between EUR 2 and 10 million	1	16	6	
Between EUR 10 and 50 million			18	2
More than EUR 50 million				43

If there is no decrease in the two attributes mentioned above, it is very likely to be assumed that the later discussed methods/tools used by companies for keeping in touch with each other contribute to success. Regarding remaining in or falling out from a category (upwards or downwards), we observe that enterprises positioning themselves above the main diagonal in the matrix has increased either in number of people employed or revenue. Companies under the diagonal have decreased. However, they can overlap, and growth can also be observed inside a group to have a conclusion with the highest certainty. We investigated only those companies that have grown in at least one of the two categories. There was only one case where a certain growth in both the number of employees and revenue could have been observed. Based on these 25 enterprises, the average value of the importance in the growth in the supply chain was 3.80 on a 5-point Likert scale. Compared to the whole survey mean, 3.84, it is surprising that the value is somewhat lower.

While operating in the supply chain the following (the five most frequently mentioned) solutions are used (see Table 6). How often the solution is used had to be indicated by numbers from 1 (not at all) up to 5 (to a great extent).

Table 6. Solutions used in the supply chain (Source: authors' compilation)

Solutions	**Mean**	**Standard deviation**	**Standard error of the mean**
Supplier rating	3.88	1.22	0.11
EDI	3.84	1.28	0.12
Customer rating	3.54	1.35	0.12
Computer aided ordering (automatic)	3.51	1.59	0.15
Joint planning	3.39	1.23	0.11

Due to the fact that these variables were measured only on an interval scale (a typical five-point Likert scale was used) and the means are very close to each other, related-samples Wilcoxon signed-rank nonparametric test can be executed to check whether there is a real difference in the means, i.e. the order is a real order. Paired-samples t-tests is not an appropriate choice because on a Likert-scale normal

distribution cannot be interpreted (the scale cannot be considered continuous). Without mentioning the t-values, a table can be constructed to indicate the p-values (see Table 7).

Table 7 P-values for the related-samples Wilcoxon signed-rank tests (Source: authors' compilation)

	Supplier rating	**EDI**	**Customer rating**	**Computer aided ordering (automatic)**	**Joint planning**
Supplier rating	-				
EDI	0.790	-			
Customer rating	0.006	0.034	-		
Computer aided ordering (automatic)	0.038	0.036	0.983	-	
Joint planning	0.001	0.001	0.453	0.467	-

Based on these values in Table 7, the following conclusions can be drawn (at the 5% level of significance): supplier rating and EDI have the same importance, but both of them are ranked significantly higher than the others. Investigating each pair of customer rating, computer-aided ordering and joint planning, the Wilcoxon tests do not show significant differences. So, the order consists of a shared first place (supplier rating and EDI) and a shared second place (customer rating, computer-aided ordering, joint planning).

The use of EDI solutions is independent of the number of people employed (Pearson Chi-Square = 22.372, $p = 0.034$).

Seventy-seven percent of the enterprises require the service of an external provider in the field of freight forwarding, 18% in the field of storage and 8% in the field of inventory management. Forty-three percent of enterprises provide services in the sample, the highest proportion regarding the functional field, and arrange forwarding on their own. These companies are typically those that provide forwarding as a service.

Conclusions

Although some strange and possibly questionable conclusions can be drawn based on the data collected, and that is why the results have to be handled with reservations, some of them can meet the previous expectations. There are a number of reasons for assuming their reality, like without electronic data interchange, there is no success in the business. Very few of the enterprises can afford not to have any kind of IT systems but these are micro enterprises, which more or less explains it.

Three different attributions were used to examine whether the companies are aware of the importance of the field of logistics: strategy, organisational unit and ERP systems with a special module, in broader sense IT systems. The main findings were the following: Among the companies involved in the survey, there is a separate strategy for logistics itself in 55% and almost all of them (91% of the 55%) do have a department for executing it and 77% of them use ERP systems. But the reverse is not true: there is a separate organisational unit for logistics in 79% but only 67% of this 79% have such a strategy. ERP system with a special module for logistics is used in 72%. We might conclude that the existence of strategy is the key factor because if there is a strategy, it entails the other factors, but this is not true: where there is no logistics strategy, the probability is almost two times higher to have a separate organisational unit for logistics. Although there is no strategy in 45% of the surveyed companies, even those companies have separate organisational unit for logistics and/or ERP system with a special module in 78%. To summarise, we can point out that the awareness is of high importance, but special strategy does not seem to be needed for operating successfully in business.

What are the most important methods/tools that make a company successful? Based on the responses the top five ones are the following: first supplier ratings and EDI with equal importance, and second customer rating, computer-aided ordering and joint planning. The customers and the suppliers evaluate

each other and these evaluations play a very important role and can be key performance indicators when it is about the decision of maintaining the (long) term cooperation in an unchanged form. The importance of joint planning underlines the results of previous (secondary) research, such as trust is one of the most important factors in the cooperation of the supply chain for example.

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COMPREHENSIVE TECHNOLOGY-BASED LEARNING (CTBL): A COMPARISON BETWEEN VARIOUS TYPES OF QUANTITATIVE COURSES

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Abstract. Learning quantitative courses in higher education is difficult because students need to understand complex principles and solve complicated questions. In these courses, new knowledge depends on prior knowledge and when gaps in students' understanding occur, they are difficult to overcome. The study examines a new model called comprehensive technology-based learning (CTBL) designed to overcome these difficulties.

The problem is addressed by full coverage of the curriculum in a variety of textual and video learning tools, as well as an ongoing process of diagnosis and prognosis, designed to overcome students' difficulties and knowledge gaps. The study examined the students' attitudes towards CTBL model relating to three quantitative courses $(n_1 = 39,\ n_2 = 25,\ n_3 = 18,\ n_{total} = 82)$. It points out that a quantitative course based on CTBL significantly nurtures students' learning. Improving learning and overcoming knowledge gaps are influenced by several characteristics: Full coverage of the curriculum, excellent learning experience, repetition of the material without limitations, flexibility to learn outside the classroom, a variety of means to choose which ones are more appropriate, and making learning much easier. Beyond that, the diagnosis and prognosis done by the lecturer cause the instructor to intervene in real time, to solve the students' difficulties on an ongoing basis.

Keywords: CTBL: Comprehensive Technology-Based Learning; online learning; educational technology; quantitative course; feedback.

JEL Classification: I21; I23.

Introduction

Learning quantitative courses in higher education is difficult because students need to understand complex principles and procedures and solve complicated questions. Besides, these courses are based on a hierarchical structure, that is, new knowledge depends on prior knowledge. Therefore, when gaps in students' understanding occur, they are difficult to overcome, making progress arduous. As gaps widen, learning becomes more and more onerous often culminating in loss of the learner's connection with the course. The Comprehensive Technology-Based Learning (CTBL) model intends to overcome these difficulties. This is achieved through the full coverage of the curriculum on the course site, the presentation of a variety of textual and video-based learning tools, and an ongoing process of diagnosis and prognosis designed to overcome students' difficulties and knowledge gaps. The first study, which examined the CTBL model, referred to computer courses only and found that it was very suitable for this type of courses (Ghilay 2017a). The present two-year study examined the model more thoroughly, and also referred to a different type of quantitative theoretical courses, such as mathematics or statistics. The degree of suitability for both courses (mathematics/statistics and computer courses) was examined, and also a comparison between them was made.

Description of the CTBL model

To ensure that the learning process in various types of quantitative courses is effective, a new paradigm has been adopted to provide a comprehensive and complete response to all student difficulties. The Comprehensive Technology-Based Learning (CTBL) model intends to offer a better educational environment than traditional learning. This includes the following major components (Ghilay 2017a):

1. *Full coverage of all learning needs including a variety of learning tools*: The course site includes full coverage of texts and video clips for all lectures. All videos are created through video capture

technology. In addition, complete solutions are provided for all the exercises in the course as follows: For computer courses, all the solutions are presented through video clips, while for theoretical courses such as mathematics or statistics, they are provided using detailed text. When a student repeats the material taught in class or completes a missing element due to absence, it is possible to review all the material including exercises and solutions.

2. *Ongoing daily diagnostic process to find students' learning difficulties*: To address the problem of growing gaps and promoting students, lecturers are required to conduct an ongoing diagnosis of the learners' situation in order to identify the weak points and intervene in real time. Based on various digital communication channels, diagnosis is carried out in the following ways:

   - Feedback questionnaires covering each subtopic: At the end of every main topic, each student answers an online questionnaire covering all subtopics of the main topic.
   - Daily monitoring of exercises' status: All the course exercises and exams are computerized and the instructor can supervise the students' progress.
   - Constant monitoring of student attendance (for face-to-face courses) or entries to the course website (for distance courses): Through the course website, the lecturer can monitor the students' lack of class or level of activity on the site.
   - Questions and requests forwarded to the lecturer by the students: Questions or requests from students are transmitted through technology-based communication channels. This information is another important component of the diagnostic process used as the basis for the prognosis.

3. *Prolonged prognosis in order to solve students' learning difficulties*: This includes real-time intervention by the lecturer to provide an ongoing response to all students' difficulties. It is possible to solve problems by explaining unclear issues, adjusting the pace of progress, delaying the submission time or adding answering attempts while treating each student in an appropriate and individual manner. Help of any kind may be provided remotely through the various technology-based communication channels. In special cases, assistance can also be provided by connecting the lecturer to the student's computer and providing personal guidance. If students are missing or inactive, the lecturer can contact them and see if they need help.

Examining students' views towards the CTBL model

The present two-year study examined the students' attitudes regarding various characteristics of the CTBL model.

The intention was to examine different types of quantitative courses: theoretical, such as mathematics or statistics and computer courses and to check whether CTBL is effective for such difficult courses. Therefore, the following three courses, representing the majority of the quantitative courses, were selected: mathematics, statistics and a computer course (PSPP). Moreover, these characteristics were also examined in different ways of learning: face-to-face learning and distance learning.

The following research questions were designed to examine the characteristics and benefits of the CTBL model for quantitative courses in higher education:

- Does the CTBL model help improve the learning process of quantitative courses in higher education?
- If there is an improvement, what are the reasons?

Three groups of students who studied the following courses were examined:

1. Mathematics for business administration: first year students.
2. Introduction to statistics: first year students.
3. Fundamentals of PSPP (statistical software equivalent to SPSS): third year students.

The three courses examined were based on the CTBL model. Thus, at the beginning of each course, students were told they would learn in a specific way called comprehensive technology-based learning,

including the following characteristics presented on the course website and on the board (in face-to-face lessons only):

1. Full coverage of the material in texts including answers to exercises.

2. Full video coverage of the material.

3. Feedback questionnaires at the end of each topic.

4. Complete coverage of the course files.

5. Guided practice in class.

6. Asking questions and receiving answers during and outside the lesson (including connecting to the student's computer at home).

All students participated, studied in the Department of Management and Economics at the NB School of Design and Education, Haifa, Israel. The three courses included the following topics:

Mathematics for business administration: Functions, linear inequalities, quadratic inequalities, exponents and roots, logarithms, arithmetic sequence, geometric sequence, derivative, integral. *Introduction to statistics:* Introduction – basic terms, measurement scales, group data in tables, visualization of the distribution of frequencies, rules of summation (basic use of Sigma and Sigma rules), measures of central tendency (mode, midrange, median and mean), measures of dispersion, relative position of data (standard scores), distribution of standard scores, the standard normal curve.

Fundamentals of PSPP: Introduction to PSPP, data editor, foundations of descriptive statistics, syntax, case selection, descriptive statistics – additional tools (Descriptives and Explore), means, computerized variables, sort files and data control, independent samples t-test, paired samples t-test and one-sample t-test, ANOVA (one way analysis of variance), correlations, crosstabs and chi square test, reliability (Cronbach's alpha including item analysis) and factor analysis.

Literature Review

Texts in the digital age

Texts are essential in managing and supporting online learning. Before the digital age, texts were printed on paper and physically distributed to readers. In the digital age text is distributed over the Internet. Students now have access to enormous amounts of high-quality text without a limit on quantity. While learners can still print out the text on paper, these writings can now be comfortably read without printing them due to sophisticated mobile devices such as tablets and smartphones (Ghilay 2017a).

The most common digital replacement for paper output is the PDF (Portable Document Format) file invented by Adobe. It is able to accurately display digital documents regardless of platform (computer hardware or operating system). Today PDF is the accepted standard for distributing text files. A significant advantage of PDF is the ability to lock documents so they cannot be changed and thus prevent distortion. In the online learning world, it allows for the distribution of texts (and hypertext) produced by a variety of software tools without the necessity of acquiring the software that created the original document. Moreover, the PDF output is identical to that of the source so it can be read and printed (Ghilay 2017a).

Another advantage of PDF is the possibility of creating a single file that combines text from different sources, which can be numbered and arranged in any order enabling lecturers to prepare digital booklets that include texts from a variety of sources, such as a word processor, a spreadsheet, or a scanner (Ghilay 2017a).

Video in online learning

Video is an excellent technology for online learning, especially as an asynchronous replacement or supplement for face-to-face learning. There are two main ways for producing video clips: using a camera or by unique technology called video capture/screencast (Ghilay 2018; Ghilay 2017a; Ghilay 2017b). Video capture is a special way designed for producing video clips of a presenter's computer screen and

it can be combined with the guide's audio narration. The screen activity is recorded in real time whereas the complementary audio can be recorded at the same time or separately with the addition of different effects and/or music. During the editing stage, additional changes can be undertaken including splitting and merging sections, hiding and exposing parts of the screen or adding photos, titles or subtitles (Ghilay 2018; Ghilay 2017a; Ghilay 2017b). Video capture is an exceptional substitute for video camera recording and it can give learners even more dynamic and exciting content (Ruffini 2012). Furthermore, since the clips can be stopped or reviewed anytime, anywhere (Screencast 2018), learners can advance at their own speed, which is helpful for improving the learning at the institute of higher education or even outside the classroom.

Using video capture for learning is significantly advantageous (Peterson 2007). The enormous increase in the use of smartphones and tablets allows students to watch useful videos while overcoming time and location constraints (Ghilay 2018; Campbell et al. 2010).

Video capture clips can be an adequate substitute for face-to-face lectures (Pang 2009; Traphagan et al. 2010) and there is clear evidence regarding the general advantages of using such means for student learning as a replacement to other ways of studying (Campbell et al. 2010; de Koning et al. 2007; Gardner 1983; Mayer 2009; Smith and Smith 2012; Walker 2010). Hartsell and Yuen (2006) claim that online video-based instruction "brings courses alive by allowing online learners to use their visual and auditory senses to learn complex concepts and difficult procedures" (p. 31).

Feedback-based learning and real-time intervention

To address the problem of growing gaps and promoting students, lecturers are required to conduct an ongoing diagnosis of the learners' situation in order to identify the weak points and intervene in real time. In order to achieve an effective diagnosis, appropriate feedback is needed. Promoting student success in learning has become an issue of concern among educators all over the world (Elton, Johnston 2002; Knight, Yorke 2003; Race 2005). A substantial number of students come into a class with all the appropriate prerequisites, yet they are incapable of handling the course material (Wilson, Scalise 2006). The usual explanation for student difficulties is that they do not study enough or they are not interested (Hesse 1989). In light of the fact that communication between faculty and students is a critical element of higher education, effective feedback may be the missing component in successful outcomes (Felder, Brent 2004). Higher education will not be significantly improved, as Burksaitiene (2011) argues, until the feedback system is changed.

Feedback can have different functions depending upon the learning environment, the needs of the learner, the purpose of the task, and the feedback paradigm adopted (Poulos, Mahony 2008). In order to be effective, feedback should close the gap between students' actual performance level and the level required by lecturers. Efficient feedback gives specifics regarding shortcomings (Hattie and Timperley 2007).

Yet international research indicates that students respond very well to feedback delivered in a digital format. A meta-analysis of more than 7,000 studies (Hattie, Timperley 2007) reveals that multimedia feedback is one of the most effective ways to obtain positive results from feedback. While the term "feedback" refers to information provided to students to encourage them to improve their learning, information from students to lecturers may be just as transformative, assisting academic staff in changing their manner of teaching to better fit learners' needs. Often students are the first appraisers of whether teaching is good or not. That said, too many institutions are not geared to accept student insights in an atmosphere that genuinely welcomes such feedback. Although requesting student feedback on their learning experience at the end of a semester has become common practice in many institutes, their views may not have any actual impact. Institutions of higher education need to create environments and mechanisms that allow student views, learning experiences, and performance to be taken into account (McAleese et al. 2013).

A model called feedback-based learning (Ghilay 2017a; Ghilay, Ghilay 2015) confronts the challenge of getting institutions of higher education to appreciate the validity of students' learning experience. It provides immediate student responses to lecturers' practice via use of personal smartphones (or tablets/laptops) to online questionnaires concerning the delivery of the educational program. The model

significantly improves student feedback to faculty by informing lecturers how each subtopic has been understood and implemented by all students in the course. This enables instructors to respond in real time to student difficulties either by explaining topics over again or by discussing issues that are surrounded by lack of clarity.

Methodology

The study examined the students' attitudes towards CTBL model relating to three quantitative courses, which are divided into two categories: theoretical courses and computer courses. The same lecturer prepared all the course sites and conducted the three courses.

The following research questions were focused upon:

- Does the CTBL model help improve the learning process of quantitative courses in higher education?
- If there is an improvement, what are the reasons?

The research population addressed through the study included all those who were studying quantitative courses based on CTBL at institutions of higher education in Israel. Three samples that have been examined are presented in the Table 1.

Table 1. The study samples (Source: Author's compilation)

No.	Course	Year	Way of Learning	Sample Size	Rate of Response
1	Mathematics for business administration	2016-2017	Face-to-face	39	95.1% (39/41)
2	Introduction to statistics	2017-2018	Face-to-face	25	96.3% (26/27)
3	Fundamentals of PSPP	2017-2018	Distance	18	89.5% (17/19)
	Total			82	

Respondents were asked to answer an online 5-point Likert scale questionnaire consisting of 53 items (1 – strongly disagree, 2 – mostly disagree, 3 – moderately agree, 4 – mostly agree, 5 – strongly agree). At the end of the questionnaire, the following open ended question was added:

Does CTBL help you in the learning process? Please explain and detail the reasons.

The following nine factors divided into two main categories were examined (general evaluation of CTBL model and characteristics that may be reasons for its success/failure):

General evaluation of CTBL: CTBL contribution to learning quantitative courses.

Characteristics of CTBL: Full coverage, learning experience, repetition of the material without limitations, flexibility, variety of means, ease of learning, diagnosis and prognosis: The lecturer's intervention in real time.

Table 2 summarizes the nine factors, the items composing them and the reliability. For each factor, a mean score was calculated (including standard deviation). One-way ANOVA was conducted for checking significant differences among the three courses in the study. Paired samples t-test was undertaken as well for checking significant differences between pairs of factors $(\alpha \leq 0.05)$.

Table 2. Factors and reliability (Source: Author's compilation)

Factors	Questionnaire's Questions
Contribution to learning quantitative courses (Alpha=0.868)	Comprehensive learning is helpful for better understanding of the material.
	Comprehensive learning helps me to be well prepared for the final exam.
	Comprehensive learning allows me to deepen my understanding of the material.

	Comprehensive learning produces meaningful learning. Comprehensive learning is better than traditional learning. I prefer comprehensive learning over regular modes of learning.
Full coverage (Alpha=0.925)	Full textual coverage of the material helps me learn. Full video coverage of the material helps me learn. Full video coverage of all exercises is helpful. The clips on all the theoretical material are helpful for my progress. The clips on all the exercises are useful for my progress.
Learning experience (Alpha=0.946)	Comprehensive learning allows me to be active. The learning experience is much better. I enjoy learning with technology. Comprehensive learning makes learning much more attractive. Comprehensive learning increases my motivation. I have the feeling that the lecturer is interested in me. I have the impression that the lecturer is interested in my progress. It is convenient for me to turn the lecturer even outside of class. The lecturer invites us to keep in touch with regard to our studies Comprehensive learning improves my ability to concentrate.
Repetition of the material without limitations (Alpha=0.839)	It is easy to understand issues that are unclear by watching video clips again It is easy to understand unclear issues by reviewing comprehensive texts again. It is possible to get better by repeating recorded lectures and exercises.
Flexibility (Alpha=0.952)	The combination of technology and connection to the lecturer has added value. There is a complementary relationship between technological tools and human involvement. The limitation of meeting time and location is significantly reduced. It is easy to continue learning outside of class.
Variety of means (Alpha=0.957)	The variety of learning alternatives allows me to overcome difficulties. The variety of alternatives allows the lecturer to focus on important issues. The variety of alternatives allows learners to select the most appropriate tools. Ways of learning can be suited to personal learning styles. Students are exposed to a huge variety of exercises to solve. The variety of learning alternatives improves my ability to handle difficulties. Practicing various alternatives improves learning. The variety of practice exams is excellent preparation for the final exam. Getting an answer using various channels of communication is helpful.
Ease of learning (Alpha=0.854)	Comprehensive learning helps overcome difficulties more easily. It is very easy to demonstrate complex issues. Overcoming gaps is easy.
Diagnosis	Concurrent online feedback is helpful in diagnosing difficulties in real-time

(Alpha=0.864)	Concurrent online feedback is useful in eliminating knowledge gaps in real-time. Current monitoring of the status of the exercises is helpful. Constant monitoring of student activity is useful.
Prognosis: The lecturer's intervention in real time (Alpha=0.923)	The prompt response of the lecturer to our requests contributes greatly to learning. The lecturer shares helpful techniques for learning. Having academic assistance in class is helpful. Having academic assistance at home is helpful. Having assistance with installation and use of software tools is useful. It is easy to understand unclear issues by having additional help from the lecturer in real-time. The lecturer's willingness to help is crucial for eliminating gaps. Only few gaps are created since difficulties are dealt with immediately It is easy to have either human or technological feedback in real-time.

Results

Table 3 presents the mean scores of the three samples:

Table 3. Samples' mean scores (Source: Author's compilation)

Factor	**Course**	**N**	**Mean**	**S.D**	**Factor**	**Course**	**N**	**Mean**	**S.D**
Contribution to learning	Math	39	4.54	.51	Variety of means	Math	39	4.56	.52
	Statistics	25	4.63	.41		Statistics	25	4.64	.50
	PSPP	18	4.60	.44		PSPP	18	4.57	.59
Full coverage	Math	39	4.57	.49	Ease of learning	Math	39	4.47	.56
	Statistics	25	4.68	.48		Statistics	25	4.61	.48
	PSPP	18	4.61	.54		PSPP	18	4.52	.55
Learning experience	Math	39	4.64	.47	Diagnosis	Math	39	4.44	.60
	Statistics	25	4.65	.49		Statistics	25	4.56	.55
	PSPP	18	4.49	.61		PSPP	18	4.56	.48
Repeat the material without limitations	Math	39	4.53	.52	Prognosis: The lecturer's	Math	39	4.58	.48
	Statistics	25	4.65	.45		Statistics	25	4.63	.45
	PSPP	18	4.61	.40		PSPP	18	4.59	.50
Flexibility	Math	39	4.50	.50					
	Statistics	25	4.64	.46					
	PSPP	18	4.63	.45					

Table 4 presents results of One Way ANOVA ($\alpha \leq 0.05$) intended to find out if there are significant differences between the mean scores of all the samples, relating to the factors mentioned above:

Table 4. One Way ANOVA results (Source: Author's compilation)

Category	**Factor**	**ANOVA**
General evaluation of CTBL	Contribution to learning	$F(2,79) = .305,\ p = .738$

Characteristics of CTBL	Full coverage	$F(2,79) = .345,\ p = .709$
	Learning experience	$F(2,79) = .690,\ p = .504$
	Repetition of the material without limitations	$F(2,79) = .553,\ p = .577$
	Flexibility	$F(2,79) = .783,\ p = .461$
	Variety of means	$F(2,79) = .200,\ p = .819$
	Ease of learning	$F(2,79) = .469,\ p = .627$
	Diagnosis	$F(2,79) = .489,\ p = .615$
	Prognosis	$F(2,79) = .113,\ p = .894$

The above findings indicate that no significant differences were found between the means of all the samples, for all factors. Therefore, the mean factors for all these samples together are shown in Table 5.

Table 5. Mean factors: three samples together (Source: Author's compilation)

Category	**Factor**	**N**	**Mean**	**S.D**
General evaluation of CTBL	Contribution to learning	82	4.58	.46
Characteristics of CTBL	Full coverage	82	4.61	.49
	Learning experience	82	4.61	.51
	Prognosis: The lecturer's intervention in real time	82	4.60	.47
	Repetition of the material without limitations	82	4.59	.47
	Variety of means	82	4.59	.52
	Flexibility	82	4.57	.47
	Ease of learning	82	4.52	.53
	Diagnosis	82	4.50	.56

As for the overall assessment of the CTBL model, the contribution to learning has been highly rated among learners (4.58). Students argue that CTBL is very helpful in understanding the material better and preparing for the exam and that it is much better than traditional ways of learning. Besides, all CTBL characteristics are perceived to be highly rated as well: Full coverage of the curriculum (4.61), learning experience (4.61), prognosis: The lecturer's intervention in real time (4.60), repetition of the material without limitations (4.59), variety of means (4.59), flexibility (4.57), ease of learning (4.52) and diagnosis (4.50).

Based on paired samples *t*-test $(\alpha \le 0.05)$, there were no significant differences between the first four factors of the second category and the sixth: Full coverage (4.61), learning experience (4.61), prognosis (4.60), repetition of the material without limitations (4.59) and flexibility (4.57).

There were significant differences between the following pairs, presented in Table 6:

Table 6. Paired Samples T-test (Source: Author's compilation)

Pairs	**T-test**
Full coverage (4.61) – variety of means (4.59)	$t_{(81)} = 2.033,\ p = .046$
Full coverage (4.61) – ease of learning (4.52)	$t_{(81)} = 3.079,\ p = .003$

Full coverage (4.61) – diagnosis (4.50)	$t_{(81)} = 3.103,\ p = .003$
Learning experience (4.61) – ease of learning (4.52)	$t_{(81)} = 3.633,\ p = .000$
Learning experience (4.61) – diagnosis (4.50)	$t_{(81)} = 2.833,\ p = .006$
Prognosis: The lecturer's intervention in real time (4.60) – Ease of learning (4.52)	$t_{(81)} = 2.651,\ p = .010$
Prognosis: The lecturer's intervention in real time (4.60) – diagnosis (4.50)	$t_{(81)} = 3.008,\ p = .004$
Repetition of the material without limitations (4.59) – ease of learning (4.52)	$t_{(81)} = 2.216,\ p = .029$
Repetition of the material without limitations (4.59) – diagnosis (4.50)	$t_{(81)} = 3.255,\ p = .002$
Variety of means (4.59) – diagnosis (4.50)	$t_{(81)} = 2.160,\ p = .034$
Flexibility (4.57) – diagnosis (4.50)	$t_{(81)} = 3.854,\ p = .000$

This means that students evaluate the CTBL model as a great contribution to their learning while providing all learning needs, giving an excellent learning experience, great flexibility and a lot of learning tools. The diagnostic process is very effective in mapping the students' difficulties and is the basis for the effective intervention of the lecturer in real time when such intervention is required.

For the bottom line, CTBL has a significant impact on students facing the challenge of learning quantitative courses, as it makes a significant contribution to their learning.

The open-ended question strengthens the closed items and gives them more validity as presented in the following quotations of respondents:

Mathematics for business administration:

"*The method is very effective and very helpful for learning. I'm very pleased".* "*Learning with the new method is much more interesting and easier to focus on.*"

Introduction to statistics:

"It is very good that we had an opportunity to learn using CTBL. I was very interested in all subjects and highly motivated."

Fundamentals of PSPP:

"*CTBL is very helpful for my learning process.*"

"*This is an extraordinary way of learning. It saves time and is very helpful.*"

These statements are testimony to the high effectiveness of the CTBL model for the study of quantitative courses in higher education. Since quantitative courses are difficult to understand, CTBL is perceived as very helpful for students' learning and for making significant progress.

Conclusions

Studying quantitative courses in higher education is difficult, because students should understand complex principles and procedures. In such courses, learners have to acquire the ability to solve complex, theoretical problems like mathematics or statistics, or computer-based, such as PSPP. Running a course based on CTBL intends to support the acquisition of such knowledge.

The present two-year study examined the CTBL model for various types of quantitative courses (theoretical and computer based) and different learning methods (face-to-face and distance). The findings show that there are no significant differences among all the courses examined. This means that regardless of the learning style, the time or specific type of course, the results remain stable.

The study points out that a quantitative course based on CTBL significantly nurtures students' learning. This is achieved by creating a better learning environment, characterized by the following features, which are highly rated by learners.

1. *Full coverage of the course curriculum*: There is a double coverage of all lectures – full textual coverage as well as full video coverage. The duplication is not superfluous but creates a complementary connection between the two methods. Moreover, this can help students who prefer a particular learning style, choose what is more appropriate, or combine the two.
2. *Learning experience*: There is a unique learning experience that enables students to be active and enjoy learning while increasing their motivation. In addition, the students are more satisfied because they feel that the lecturer is interested in them and in their progress. So they are more likely to turn to the lecturer and ask for his/her help if necessary.
3. *Repetition of the material without limitations*: Students can easily understand unclear topics by re-watching videos or reading comprehensive texts again.
4. *Flexibility*: The combination of technology and connection to the lecturer has added value and the time and place constraints in face-to-face meetings are significantly reduced.
5. *Variety of means*: The variety of learning alternatives enables students to overcome difficulties, choose the most appropriate tools and suit them to personal learning styles. Students are exposed to a variety of exercises to be solved and practice exams, which is very helpful.
6. *Ease of learning*: CTBL helps to overcome difficulties more easily, making it easier to demonstrate difficult problems and overcoming gaps.
7. *Diagnosis*: The diagnostic process is based on an integration of online feedback questionnaires, daily monitoring of exercises' status, constant monitoring of student activity (attendance or activity on the course site) and requests forwarded to the lecturer by the students. All of these channels provide an excellent basis for the lecturer's focused interventions.
8. *Prognosis: The lecturer's intervention in real time*: This includes real-time intervention by the lecturer to provide an ongoing response to all students' difficulties, as found in the diagnostic stage.

Due to the significant contribution of the CTBL model to the learning of quantitative courses, it is recommended that CTBL is adopted in institutions of higher education that face the challenge of teaching courses of this type. Unfortunately, not all faculty members are familiar with the relevant topics of educational technology, especially the management of online courses in higher education.

In order to move forward, it may be useful to carry out training programmes so that lecturers will be familiar with the principles and practice of online courses management in higher education in general and the CTBL model in particular. Such knowledge can be purchased on the basis of the TMOC (Training for the Management of Online Courses) model (Ghilay, 2017a; Ghilay & Ghilay, 2014).

Larger implications of the study may be that existing students will be more successful, while other candidates will be able to attend the faculty teaching quantitative courses. Such courses are considered very difficult for many applicants and there are students who are unable to face the challenge. The adoption of the CTBL model may have significant social significance, as it may improve the accessibility of more and more students to higher education in general and to the scientific faculties in particular.

Researchers are invited to examine the model for other quantitative or non-quantitative courses and additional samples. In future, it is recommended to expand the sample of the model (82) in order to improve its validity. Additional studies may also focus on other disciplines such as language learning, especially English. This area also involves considerable difficulties among learners, especially those whose first language is not English. The CTBL model may also be significant in this context.

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NEW TECHNOLOGIES IN THE RECRUITMENT PROCESS

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Abstract. Well-conducted recruitment and selection process is extremely important for the organization, permitting in-depth and objective verification of candidates in terms of meeting employer's expectations and leads to their employment. Up to now, there has been little research on the impact of e-recruitment on the recruitment process as a whole. The present study fills part of this gap by investigating the effect of e-recruitment on the design of the recruitment process. Therefore, the main purpose of the paper is to analyze how new technology has influenced the recruitment process as a whole. The recruitment process will be presented on the example of ItutorGroup. The paper considers the possibilities of including modern technologies in the recruitment and selection strategies of the organization based on a case study method. The case study describes the project of cooperation of the Work Service personnel consultancy with the international organization ItutorGroup. Its selection and recruitment strategy was based on video-recruitment. The findings indicate that e-recruitment transforms the traditional recruitment process into a time- and space-independent, collaborative hiring process. The most significant changes are recorded in the sequence and increased divisibility of main recruitment tasks. For management, the main task is now that of communicating with candidates. Recruitment and selection strategy based on modern technologies requires an experienced and competent team, two unquestionable benefits are: limiting the length of the process in time and possibility to decrease the costs.

Keywords: Recruitment; selection process; internet based technologies

JEL Classification: M12, M15

Introduction

Recruitment and selection, like every other aspect of business today depends on speed and accuracy. With increasing numbers of qualified applicants chasing a decreasing pool of jobs, HR professionals need to find ways to sort through applications quickly, while accurately selecting the best candidates. The help may come through the use of new technologies, which may speed up the process.

One can risk a statement that the area of new technologies and personnel policy are trying to keep up with new trends change at a surprising and convergent pace (Wiernek 2006, p. 76). Changing the role of human resource management in an organization requires adjusting the whole enterprise strategy to it (Jabłoński 2011, p.157).

Personnel selection includes three key steps: recruitment, selection and implementation for work (Listwan 2010, p.80). Well-conducted recruitment and selection process is extremely important for the organization, because it permits for in-depth and objective verification of candidates in terms of meeting their employer's expectations and leads to their employment. The main task and purpose of the personnel selection team is not the process itself, but the final choice of a person who meets all criteria and is unambiguously suitable for a given position.

An increasing number of practitioners from the HR area recognize that their hard and often repetitive work can be supported or even completely replaced by tools from the area of modern technologies. A lot of companies use online knowledge management systems to hire employees, exploiting the advantages of the World Wide Web. These are termed as e-recruitment systems and automate the process of publishing positions and receiving CVs (Faliagka, 2012, p. 523).

E-recruitment systems have seen an explosive expansion in the past few years (De Meo et al., 2007), allowing HR agencies and HR departments to target a very wide audience at a small cost. Several e-

recruitment systems have been proposed with an objective to automate and speed-up the recruitment process, leading to a better overall user experience and increasing efficiency.

Up to now, there has been little research on the impact of e-recruitment on the recruitment process as a whole. Moreover, much of the research tend to focus on the design of corporate recruitment websites (Selden & Orenstein, 2011). Moreover, little attention has been given to the impact of technology on the recruitment process as a whole (Parry & Tyson, 2009). Despite the apparently widespread use of e-recruitment, however, a gap seems to have emerged between research and practice (García-Izquierdo, Aguinis, & Ramos-Villagrasa, 2010), possibly because scholars are struggling to keep up with the sheer pace of change (Anderson, 2003).

Therefore the main purpose of the paper is to analyze how new technology influenced the recruitment process as whole. The case study method will be utilized. The case study analysis will be based on one company called I-tutor group. The reason to select this company can be explained by the fact that Itutor project was the first one on the Polish market that involved employing 1500 potential employees through e-recruitment process.

The research problem constitute two main questions: (1) How does the introduction and use of e-recruitment affect the design of the traditional recruitment process? and (2) What are the advantages and disadvantages of e-recruitment versus traditional recruitment?

The paper is structured as follows: the first part deals with the literature review related to recruitment and selection with a detailed description of video-recruitment. Then, the methodology is explained. Findings are presented that relate to presenting the changes in the design of the recruitment process followed by advantages and disadvantages of e-recruitment. Finally, the conclusions are drawn.

Literature review – recruitment and selection

Personnel recruitment includes practices and activities carried out by an organization for the purpose of identifying, attracting, and influencing the job choices of competent candidates (Ployhart, 2006).

For an outsider who is not involved in the employee's employment process, lack of knowledge of the industry and its peculiarities, recruitment and selection seem to be two convergent concepts; while on the basis of human resource management, they should be distinguished from each other.

It is worth mentioning that amongst theorists and practitioners of human resource management, there is not always agreement in this field, because the selection of employees is often very ambiguous. Very often, selection is regarded as one of the stages of recruitment, where it is understood as carrying out a full personal selection. Others treat it as a completely independent process, which follows the recruitment activities and embraces selecting the best candidate for the given position from among those presented (Pocztowski 2007, p. 142). The following paper takes the second solution, that is, treating the selection and recruitment process as two separate, though interpenetrating each other at the level of the results obtained.

Among various HRM activities, recruitment is one of the human resource (HR) functions that has changed dramatically, from traditional paper-based process to digital or electronic recruitment process, commonly referred to as e-recruitment. A popular form of e-recruitment is video recruitment. It is a tool that gathers all the candidates obtained, permitting to systematize the project. However, the most important factor is time saving, which for the business side plays a significant role in planning the recruitment and selection strategies.
Video recruitment influenced the standard recruitment through the possibility to create and present employers with CVs of job applicants in the form of a video. It is currently a very popular method in Western Europe, and also in Poland, because unconventional approaches are increasingly appreciated (Puls HR, Video CV 2017).

Video recruitment is to help the human resource management team in less time-consuming but reliable verification of incoming applications. There are two types of video recruitment: an automatic (asynchronous) form and a live form (Kluza, 2015, p. 88). The live form is much more popular because

companies have been using it for a long time, mainly involving a tool like Skype. It is associated with a direct interview and few aspects distinguish it from the same. The most important of them is the possibility to organize it without the need to visit a candidate in the recruiter's office. It can take place independent of the place where both parties are staying.

Whilst Skype was and is being used to interview candidates, particularly for international recruitment, very few HR teams were familiar with "one-way" video interviews, where candidates record their answers to the questions asked and the employers reviews them at a later time. Today, the term "video interviewing" is a hot topic amongst many innovations in HR technology and whilst the term encompasses "live" video interview, there is a growing demand for the asynchronous model (Rupert, 2014). It involves building a platform on which incoming applications are collected. Interview questions are generated by the system, the answers are recorded, archived and sent to the person responsible for the selection.

One-way pre-recorded interviews save considerable time and are more convenient. As there is scheduling required, candidates can record their interviews when it suits them – without any disruption to their working day (Rupert, 2014).

Video recruitment is still a controversial and relatively new way of personnel recruitment. Nevertheless, its development is inevitable and probably in the future, it is forecasted that all phases of the selection process will be transferred to the online environment. It is worth emphasizing that the use of this tool does not mean saving time and costs by lowering the efficiency and quality of the recruitment project. On the contrary, it is more transparent, generates wider pool of candidates and helps to select better candidates (Buckley et al. 2004). Video recruitment has many supporters in Western Europe, is very dynamic in the United States and although it is only taking its first steps in the Polish market, it has great potential to remain a key determinant of most recruitment and selection processes.

Methodology

Qualitative research design was considered the most suitable for the purpose of investigation, since it permits the use of multiple data sources (Creswell, 2009), which could provide the necessary insights into a new area of research. One of the authors of this paper has participated as a recruitment specialist in the project of recruiting English teachers for ItutorGroup, which allowed access to many valuable insights of the project. We used the recruitment process as the unit of analysis and focused only on the business process. We were thus looking for possible changes in the tasks, subtasks and activities of the business process of recruiting, which could be attributed to the use of electronic recruitment, compared with the process presented. The data collection process was therefore designed to capture the entire recruitment process in the case organizations in as much detail as possible, which would permit comparative analysis for each step of the recruitment process. Thus, a mix of qualitative methods, techniques, and data sources available at the time of the research was utilized during the study. A short presentation of I-tutor is followed to give an overview of the studied company. The following paper is based on a case study method.

ItutorGroup

ItutorGroup is a global leader in the provision of educational services, mainly focused on learning English through online mechanisms, which began its activity in 1998. The company specializes in an individualized and personalized way of reaching and learning users spread around the world – this applies to both teachers and students. The company operates very dynamically on the American market, from where it officially originates, while recently the management board recognized the potential on the Chinese market, which is more open for cooperation with the Western countries and, consequently, speaking English seems to be a must. Itutor group platform also serves as a vibrant recruitment and HR tool. The creation of application was possible due to the use of Big Data methods and implementation of advanced algorithms connecting students, teachers, co-workers and available content remotely to deepen knowledge in the field of a foreign language. Itutor group strongly believes that they managed

to bring about a revolution in the teaching sector by introducing a platform and service from which users can use any available device (including mobile) 24 hours a day, seven days a week.

The project aimed to recruit English teachers for a Chinese market. The recruitment of English teachers by Itutor group was facilitated by Work Service Group- an intermediary on the Polish market. The management board of Itutor decided to contact the Polish company due to the fact that among European countries Poland is one of the leaders, when it comes to the number of people who speak English very well. In addition, it still remains a country with significantly lower costs of human capital than the rest of Europe, yet it still has a well-qualified and willing workforce (Kubisiak, 2016).

Results

The project commissioned by the Itutor Group was based on the support of recruiting and selecting 1500 English language lecturers living in Poland and ready to take on the challenge of working remotely with a client from China. Recruitment agents were not looking for potential candidates with teaching background (although it was beneficial) but for English fluency. Due to strategic transformations, the project was suspended in June 2017 and until that time, about 700 English teachers were recruited. Work Service has established a specially dedicated team of consultants headed by the HR Manager, who were responsible for recruiting English teachers for ITutor. The group consisted of 7 people: 2 Project Managers, 2 Consultants and 3 Recruitment Assistants.
The recruitment process consisted of five stages presented in Figure 1. Although it seems that the activities are sequential, at a later stage a difference in comparison with traditional recruitment will be presented.

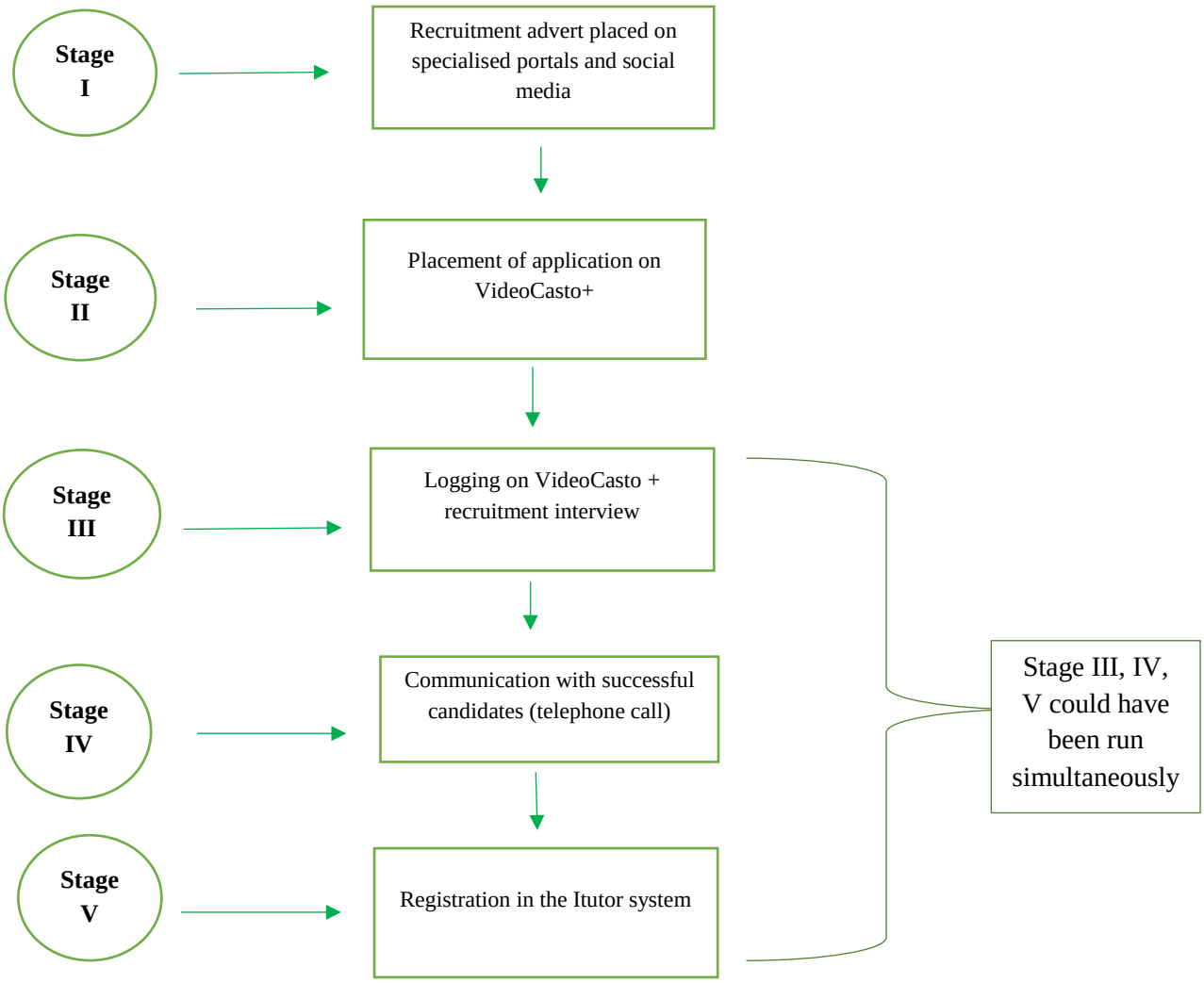

Fig. 1. Recruitment process of Itutor project (Source: Own development)

Attracting applicants

1. The first phase included recruitment activities, that is, creating an appropriate message addressed to potentially interested candidates and placing it on professional advertising portals like: Pracuj.pl, Infopraca.pl, Praca, pl, Gazetapraca.pl or Goldenline.pl, Gratka.pl and OLX.pl. The process of attracting applicants was by far the most reliant on e-recruitment sources. It must be stated that very good English teachers, who were not Internet users, were excluded from this project. A marketing recruitment campaign worked extensively in social media by preparing the sponsored posts or searching for a target group based on relevant algorithms and defining the place where potential candidates could be found. Social portals were regarded as an auxiliary channel.

Application placement

2. The second phase included the placement of the application form with necessary details by using the application prepared by VideoCasto. After the placement of the application on the platform, each person received an automatically sent e-mail with information about the project, registration in the VideoCasto application and the method for the first login enabling participation in the project. Time was already saved at this stage, because with many received applications (the project aroused great interest), even contacting with selected persons would probably last several months.

Video recruitment

3. The potential candidate logged on VideoCasto platform to take part in the automated recruitment interview. The third stage started, assessed by the Work Service team was regarded as the most crucial one. The potential candidate recorded a video interview in English, during which he answered five questions. He had about two minutes for each of them and only one approach. The questions were recorded beforehand by one of the Work Service team members. Interview questions verified mainly the knowledge of English, but also the freedom to work in front of the camera, the ability to use every day work tools and personality traits. The candidate had three days from the date of receiving the e-mail to record a video call.

Communication with successful candidates

4. Telephone call to successful potential candidates. During the call, the recruitment consultant, facilitated registration in the Itutor system. Then, with the support of the Work Service team, the user refined his profile, uploaded a language certificate, passed the equipment test and signed the contract online. For each hiring cycle, the task of communicating with applicants started at the same time as that of attracting applicants. Due to the automation features of the e-recruitment systems, candidates were often notified immediately that their job application had been received. Rejected candidates were also informed promptly about the result of the pre-screening even before the vacancies were formally filled. ITutor considered this to be an advantage for the applicants, since it meant that recruiters did not have to keep them waiting unnecessarily just to hear that they had not been selected for further assessment.
5. Registration in the I-Tutor system. 2 hours online training. Formal employment of candidates.

It is worth to compare the traditional and e-recruitment process, as presented in Figure 2.

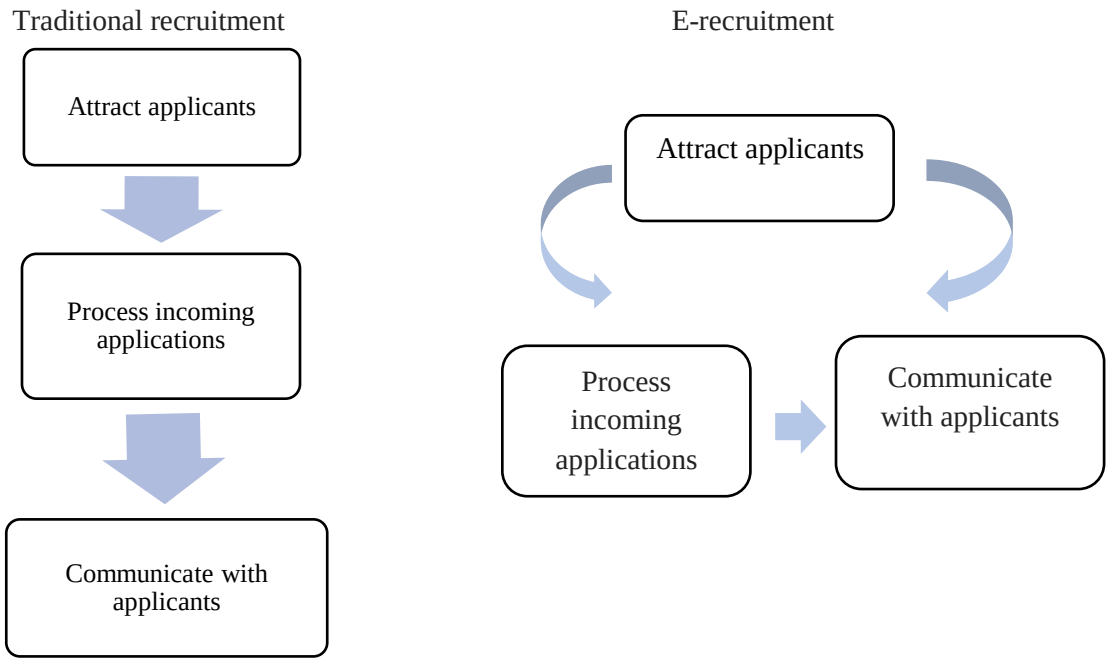

Fig. 2. The design and sequence of tasks in traditional paper-based recruitment versus e-recruitment
(Source: Own development)

The main changes in the recruitment process design using e-recruitment versus traditional paper based recruitment process were in the sequence of the process tasks. Unlike in the traditional recruitment process, the task of communicating with applicants and processing incoming applications was performed simultaneously with the task of attracting applicants suggesting a major change in the traditional recruitment. The process that demanded a lot of work was the one concerned with communicating with applicants and became a focal task.

The evaluation of the method and tools used regarding ItutorGroup is not unequivocal and depends on many factors. Although the Work Service team and the Itutor organization define the project completion as unquestionable success, it is worth taking a closer look at the advantages and disadvantages of the method used.

Time, so extremely important nowadays in every business process, has been largely saved due to internet based recruitment. At each stage, the possibility of implementing individual elements at the same time for a dozen or several dozen candidates would not be the case with standard solutions. Additionally, the quality of the recruitment process was maintained throughout the whole duration of the project. Candidates felt cared for, regardless of the time in the recruitment process. Despite the lack of direct meetings, they did not have the impression of being left alone.

The added value, often emphasized by the client's side, was lack of chaos due to the VideoCasto platform, which verified the status of not only the entire project, but also individual groups or individual candidates. Reporting took place regularly and did not require long and tedious preparations from Work Service.

The least tangible, but equally important factor was the opportunity to strengthen the image – a company that copes well with new challenges in the HR environment using modern technologies both for ItutorGroup and Work Service. So far, not a single company on the Polish market from the HR industry has used such advanced technology with limited interference of the human factor. The project ended

with success and caused interest from other companies that were impressed with the solution and wondered to what extent it could have been introduced and adapted to their requirements.

Video recruitment doesn't offer only positive benefits. The peculiarity of the process, its remote character and the lack of direct contacts (face to face) meant that the relationship with the candidate was very poorly built. Currently, HR practitioners emphasize the need to focus on the recruitment as a business partner in order to be sure not only to complete the process successfully, but also to build employer branding associated with positive experience.

Due to the peculiarity of the project, but also the position and the workplace, the employees did not feel any integration with the future employer. Very often, after completing the recruitment the process, people emphasized that they treat their duties as additional tasks, an additional source of income for what they do on a daily basis. Very few employees finally decided to devote all their time and effort to teaching through the Itutor system.

Ultimately, e-recruitment bears a threat of data infringement. Any attempt to break into or access to them by undesirable persons could have adverse effects.

Table 1. Advantages and disadvantages of e-recruitment (Source: Own development)

Advantages	Disadvantages
Savings (considering time and money)	Poorly build relationship with candidates
Strengthening the image of company introducing new challenges	Lack of integration of candidates with future employees
Reaching a broader audience of potential candidates	A threat of data infringement

Using new technology, Itutor was able to employ 1500 English teachers with the help of seven recruitment specialists. Our research is in line with Maurer and Liu (2007) who confirmed that digital recruitment reduces hiring costs by about 87 per cent as compared to the traditional recruiting through newspapers and magazines.

An extremely important aspect of the recruitment and selection processes highlighted by HR specialists is the process of building a relationship with the candidate and ultimately a potential employee. Very often, not only theorists, but also practitioners emphasize that the phenomenon of "candidate experience" in the time of development of the HR market will play an increasingly important role and the use of modern solutions will certainly have a great impact on it, but it is very difficult to clearly assess whether positive or negative. Research in this area is relatively at an early stage and none of the researchers has yet dared to make a decisive voice (Morgan J. 2017, pp. 30–43). In case of Itutor project, building a relationship with a candidate – potential employee was not implemented sufficiently. Due to remote contact and limited interference of the human factor and lack of direct meetings. Employees of Itutor did not feel part of the company, they treated the job as a form of additional income.

Conclusions

It has been shown that companies can increase the efficiency of the recruitment process and significantly cut costs, by integrating e-recruitment systems in their HR management infrastructure.

On the basis of the conducted research, we can conclude that the use of modern technologies in the recruitment and selection process is not only a guarantee of completion with the intended effect of a given project, but also causes a real improvement in the recruitment process, which allows, in particular for the business sector to reduce costs and time.

The results suggest that the typical paper-based recruitment process is no longer present in its original form and design. The most significant differences identified were attributed to changes in the sequence

of tasks and the nature of the related activities. E-recruitment techniques and related technology were observed to be used, in the tasks of attracting applicants, processing incoming applications and communicating with candidates.

Introducing a new technology in the recruitment process can have many benefits for organizations in the recruitment process but research about this is scarce. The possible benefits include time savings, cost reduction, reaching a broader audience and more accurate and detailed information about applicants. Benefits of e-recruiting can differ between organizations, because every organization has its own strategy, and recruitment objectives should support that strategy.

Finally, we can follow the statement of Ford (2015, p. 83) that the use of modern technologies in the recruitment and selection processes is not just another trend in the changing environment, but it will permanently appear in the area of human resources. Admittedly, this will not involve complete resignation from the recruiters' work, but any actions that can be supported by algorithms, solutions from the borderline of artificial intelligence will be most welcomed (in this case, the most frequently mentioned is the analysis and verification of the applications received, providing feedback to candidates or even replacing first contacts with the purpose of basic selection) (Ford 2015, pp. 83–86). Though it sounds like a vision of the future filled with solutions that will significantly simplify the work of human resource management teams; however, quite a large percentage of specialists are still wary of entrusting the decision-making process to machines. The significant potential in the field of artificial intelligence and machine learning has been proven many times, but there is still a long way to go for the HR industry to fully use them or just to convince them to be used in an appropriate way (Morgan J. 2014, p. 6–10).

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EVALUATION OF DECISION EFFECTIVENESS OVER TIME

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Abstract. In this paper, the results of my research are presented that was carried out on a large sample to investigate how people look back at their previous business decisions. After a short literature overview, considering the role of time, the paper deals with the primary research: how people judge their decisions in the short term and in the long run, that is, how confident they are that the right one was chosen applying the available knowledge of facts and conditions connected with or relevant to their situation. Using statistical methods, comparisons were made, for example, based on the respondents' gender, so it turns out whether gender has an influence on self-confidence or on exactness of judgement. Does the position, that is, the rank matter? Can it be assumed that the farther one gets up the corporate ladder, the more certainty can be observed about their decisions? And what about educational level? Does it influence judgement in a decision? Those who do not regret their decisions after a while, that is, after the original decisions were made, while being in possession of the information available later, can be more successful in business because they made the best decision. Trying to identify such characteristics or factors can be an advantage in the business life.

Keywords: Self-confidence in decisions, the role of time

JEL Classification: D83; J24

Introduction

The factors of production from classical economics in the second half of the 18th century and at the beginning of the 19th century (represented by Adam Smith and David Ricardo, e.g. Smith 2007, Ricardo 1817), the land, that is, natural resources, labour and capital stock cannot be treated as factors of competitive advantage any more, particularly in our globalised world. New factors have arisen such as access to information as well as human resource and time. While labour refers to a physical contribution to production, in the case of human resource, mental abilities also come into play – due to the fact that in developed countries and also in the developing world, the focus has shifted more and more from production to service delivery. 'Services contributed 73.9% of the EU-28's total gross value added in 2016 compared with 71.8% in 2006. The relative importance of services was particularly high in Luxembourg, Cyprus, Malta, Greece, the United Kingdom, France, the Netherlands, Belgium, Portugal and Denmark, where they accounted for at least three quarters of total value added. By contrast, the share of services was below three fifths in the Czech Republic and Ireland (EUROSTAT 2018). The other 'new' factor is time. A proverb says: 'Time is money'. This means that time is a very valuable resource, perhaps the most valuable one and the scarcest. This can also mean that time can somehow be converted to money, and vice versa. The conversion rate can depend on a lot of factors. But once the decision is made on conversion, the die is cast. Whether it was worth making the conversion, can only be judged later. People's attitude to their previous decisions can be evaluated in the light of new (and subsequently revealed) information or based on the real consequences. This research tried to reveal attitudes to the previous decisions.

The research attempts to find answers on how heavily people are convinced about their decision, that the right one(s) was (were) made over time: how time and different factors, such as gender, position and educational level influence the confidence. Those who show regret, doing so admit, that better options could have been chosen. Those who do not show regret, had presumably made good decisions, and thereby are more successful in business. A questionnaire survey was conducted to reach the aim, which was to investigate to what extent the previously mentioned factors influence the conviction and thereby the success in business.

Literature Review

The increasing importance of this topic is justified by the fact that the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel was awarded to the representatives and/or researchers of behavioural economics many times. The prize went to (Nobelprize.org 2018):

- Herbert Simon in 1978, for his pioneering research into the decision-making process within economic organizations (see, e.g., Simon 1969);
- Daniel Kahneman in 2002, for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty. He carried out most of his work with Amos Tversky, but the latter had already passed away by 2002 (see, e.g., Kahneman & Tversky 1979);
- Richard H. Thaler in 2017, for his contributions to behavioural economics (see, e.g., Thaler 2016).

However, the increasing importance of behavioural economics does not mean that a wide range of research has moved to this field. Still, understanding personal decisions requires taking more account of descriptive theories than at present.

An important factor is the time horizon of obtaining information: when it's available or how long it takes to get it. Already Kaufmann discusses the shortening of time as the consequence of the acceleration of communication speed and the role of decline in waiting time (Kaufmann 1968).

The widely-known discounted utility (DU), associated with Samuelson (Samuelson 1937), emphasizes the role of time itself. Based on the theory that a $(c_0, \dots, c_T)$ consumption is preferred to $(c'_0, \dots, c'_T)$ than and only if

$$\sum_{t=0}^{T} \delta^t u(c_t) > \sum_{t=0}^{T} \delta^t u(c'_t) \tag{1}$$

where $u(c)$ is a concave utility function interpreted on ratio scale, and δ is a discount factor for a given time period. This model has been criticized on a number of issues on an empirical basis. One is known as the common difference effect, for example. Suppose there is a person who is indifferent about increasing his consumption by x units at time t, or increasing his consumption by $y > x$ units at a later time t'. A constant c basic consumption is given in all time periods, so the following connection can be set up:

$$u(c+x)\delta^t + u(c)\delta^{t\prime} = u(c)\delta^t + u(c+y)\delta^{t'} \tag{2}$$

From this, the following is concluded:

$$u(c+x) - u(c) = \big(u(c+y) - u(c)\big)\delta^{t'-t} \tag{3}$$

That is, the choice between two consumption points depends only on the absolute time interval between them. In practice, however, the choice between two delayed outputs is often interchanged when both are increased by the same constant. Some (Loewenstein, Prelec 1992) quote Thaler, who notes that people prefer today's one apple to tomorrow's two, but at the same time, they prefer the choice of two apples 51 days later rather than one apple after 50 days.

The same problem is approached differently by Read and Roelofsma. Smaller-sooner (SS) outcomes at time t_1 and larger-later (LL) outcomes at time t_2 will be equally desirable, if $SS = \delta^{t_2 - t_1} LL$, where δ is a constant discount factor between 0 and 1. Contrary to the former authors, they sharply separate the time interval and the delay. As shown in Figure 1, in this approach, the interval is the distance between (SS) and (LL), that is, $(t_2 - t_1)$, while the delay is the distance between the present position and (LL), that is, $(t_2 - 0)$.

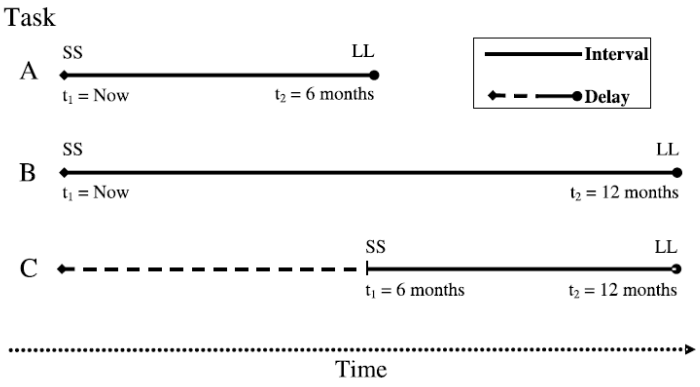

Fig 1. The time interval and the delay (Source: Read, Roelofsma, 2003 p.142)

Earlier research focuses mainly on comparing A and B tasks. Increasing patience means that the longer the interval, the smaller the δ. They also point to the weaknesses of experimental evidence of hyperbolic discounting (Read, Roelofsma 2003).

The fact that people use hyperbolic discounting has been rejected by experiments (e.g., Sopher, Sheth 2006).

Should one investigate the discounting factors for time, it cannot be interpreted in fully-mathematical way in a given situation. The question of saving is a typical time dilemma. People usually do not make such decisions like economists, however, they could get better off. Thaler and Benartzi examined the topic by setting up a real experiment, and based on this, they confirmed their theory called 'Libertarian paternalism'; that is, 'a philosophy that advocates designing institutions that help people make better decisions but do not impinge on their freedom to choose' (Thaler, Benartzi 2004, s.185).

Both time, information plays a key role. Research shows that 'voters with relatively unlimited time behave differently than voters who decide under time pressure… [however] the amount of information and time devoted to decision making does not influence the probability of making a "correct" vote (neither in a positive nor in negative way).' (Tóth & Chytilek 2018, pp. 82-83.).

Decisions are influenced not only by the time horizon of obtaining information, but the ownership also does matter. Options chosen by people differ if the decision is made on their own property or on others' (Kolnhofer-Derecskei 2017).

Considering acquiring the information, we can measure the distances not only in time but also in personal-connection distances. In Milgram's experiment, when people were asked to send a file to an unknown stranger, it turned out that completed chains varied from two to 10 intermediate acquaintances with the median at five. The distance between two randomly selected persons was also only an average five persons no matter where they happened to live in the United States (Milgram 1967). In 1967, that was the distance between two persons and so were all the documents and information. In these experiments, fixed paths are always longer than the shortest possible. The ability to obtain information has become increasingly simple and has accelerated over time. Relationships are simplified so that the threads between individuals do not break for geographic reasons. Since people are able to maintain more and more relationships, distances decrease and we can approach the three-person distance nowadays (Barabási 2002).

Methodology

Primary research was carried out using a questionnaire to reveal how people felt about their decisions over time. This was measured by two questions. The main difference between them was the length of time that elapsed from the decision making to the evaluation. The exact period of time was not

mentioned because the terms ‘short’ and ‘long’ can only be interpreted based on knowing the content of the decision, which can vary on a very wide scale. The following two questions were posed:

- Q1: Right after making your decision, how heavily convinced are you that you have made the most appropriate decision?
- Q2: After a longer period of time, how heavily convinced are you that you have made the most appropriate decision?

Respondents were asked to use percentage values from 0 to 100 to express how certain they were. How self-confident they were can be evaluated from the data.

These questions were a part of a bigger research; the whole questionnaire was published on the internet and using the snowball method, the Hungarian business decision makers were targeted. Because of the snowball method, the results have to be handled with reservation, that is, no kind of representativeness can be assumed about the sample. It has to be added that based on the literature, it is not typical in such a research either. The aim is always to proof the existence of different phenomena. However, in this research, it can be supposed that spreading the questionnaire among members of the relevant target group, raise the reliability of the survey. The big sample size supports the conclusions.

Descriptive statistical methods, such as calculating frequencies, relative frequencies, mean, median, mode, skewness, kurtosis, measuring the strength of relationship between variables (crosstab analysis) and so on, were applied to present and describe the characteristics about the sample. Inferential methods were used to compare means or medians; several (nonparametrical) tests were carried out to confirm the conclusions.

Results

In 443 cases, it was possible to compare the attitudes in the short and in the long term. 205 out of them are males and 238 females. Right after making the decision, respondents have a mean 81.36%, which indicates a high self-confidence. The value is almost the same, 80.88%, if the question refers to a longer period of time. Standard deviations calculated from the data of sample (sample standard deviations) show even less difference. In the first case, it is 14.70 and in the latter, it is 14.71. The Pearson’s correlation coefficient is of medium strength with the value of 0.5856. In both cases, the range is 100. Interestingly, in 144 cases (32.51%), the certainty has risen over time. In 168 cases (37.92%), it has decreased, and in 131 cases (29.57%), it has not changed.

Values grouped by gender are displayed in Table 1.

Table 1. Statistical characteristics (Source: author’s compilation)

Statistics	Male		Female	
	Right after	**After a longer period**	**Right after**	**After a longer period**
Number of elements	205	205	238	238
Mean	82.5073	81.4927	80.3739	80.3529
Median	85.0000	80.0000	80.0000	85.0000
Mode	90.00	80.00	80.00	90.00
Std. deviation	13.56380	13.71689	15.57962	15.52599
Skewness	-1.181	-1.374	-1.925	-1.569
Std. error of skewness	.170	.170	.158	.158

Kurtosis	1.807	3.845	5.732	3.990
Std. error of kurtosis	.338	.338	.314	.314
Range	75.00	90.00	99.00	99.00
Minimum	25.00	10.00	1.00	1.00
Maximum	100.00	100.00	100.00	100.00

To explain whether males and females differ when thinking about these questions, it would be necessary to know the decisions that later turned out to be false (e.g. on. ratio scale) and to take into account the cognitive biases, and hindsight bias in the long run. That cannot be carried out based on the data gained. However, it can be examined whether the means (very close to each other) that refer to the certainty in decision making right after, and after a long period of time, significantly differ from each other. T-test can be applied to it; however, it requires the data to be derived from a normally distributed population and (sometimes) not to have different variances in the populations.

In the case of data normally distributed, mean, median and mode have the same value. Should the kurtosis or skewness be higher or lower than +1 or -1, the distributions given differ from the normal ones. Values of skewness and kurtosis or the quotient of their standard errors must not exceed ± 2.58; in a stricter case ± 1.96 (Sajtos, Mitev 2007).

Statistics somewhat differ from expected values; the kurtosis and the skewness are also outside the borders mentioned above. Histograms and normal density functions displayed on them also help (see Figures 2–5).

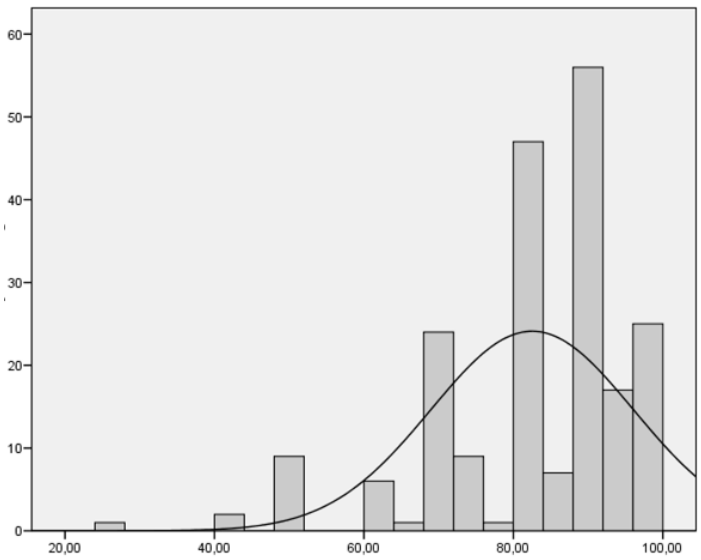

Fig. 2. Certainty right after making the decision. Subsample: males (Source: author's compilation)

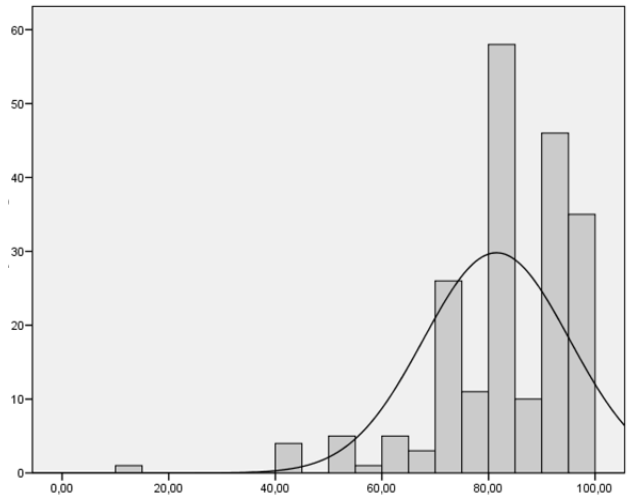

Fig. 3. Certainty after a longer period of time. Subsample: males (Source: author's compilation)

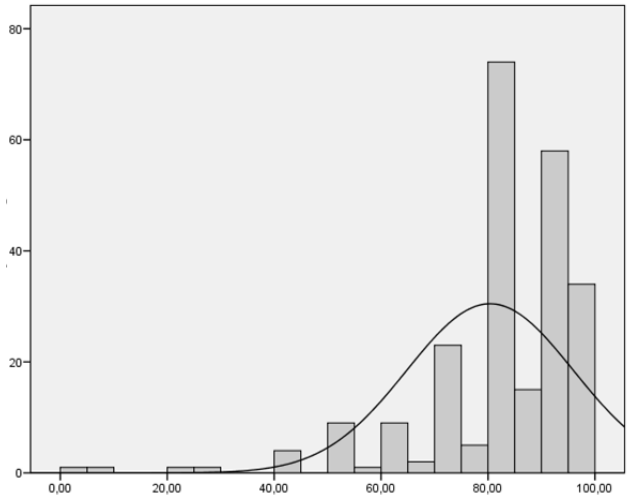

Fig. 4. Certainty right after making the decision. Subsample: females (Source: author's compilation)

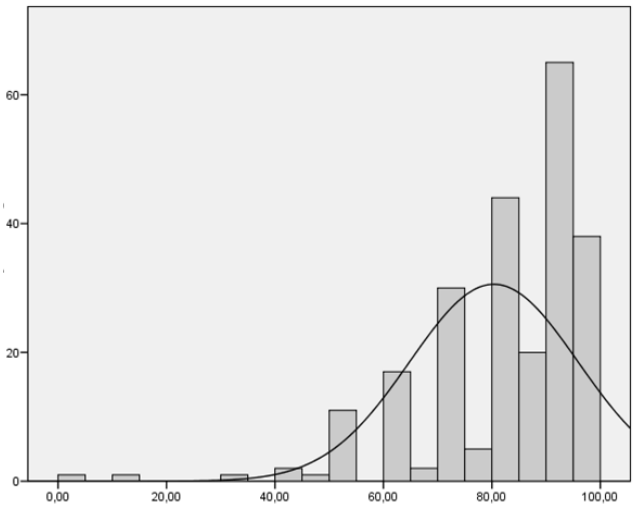

Fig. 5. Certainty after a longer period of time. Subsample: females (Source: author's compilation)

Figures 2–5 show remarkable difference from normal distributions, so Shapiro-Wilk and Kolmogorov-Smirnov with Lilliefors Significance Correction tests were applied (see Table 2).

Table 2. Tests for normal distributions (Source: author's compilation)

Certainty in making the best decision	Gender	Kolmogorov-Smirnov Lilliefors Significance Correction			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Right after	Male	0.183	205	0.000	0.894	205	0.000
	Female	0.251	238	0.000	0.828	238	0.000
After a longer period	Male	0.184	205	0.000	0.888	205	0.000
	Female	0.193	238	0.000	0.867	238	0.000

Significance levels below 0.05 indicate that in all four cases, the null hypotheses have to be rejected; samples cannot be derived from normally distributed populations. It follows that the two samples' t-test cannot be applied, so testing the variances has no sense (e.g., F-test or Levene-test).

The Mann-Whitney U and Wilcoxon W tests are nonparametric tests that do not require the assumption of normal distributions and can be applied, when variables can be ordered on ordinal scale. The hypothesis now refers to the medians instead of the means.

H_0: The certainty is equal between subsamples (males and females).

H_1: There is a significant difference.

Table 3. Rank test table (Source: author's compilation)

Certainty	Gender	N	Mean Rank	Sum of Ranks
Right after	Male	205	230.47	47246.50
	Female	238	214.70	51099.50
	Total	443		
After a longer period	Male	205	223.27	45770.00
	Female	238	220.91	52576.00
	Total	443		

Based on the results displayed in Table 3, it seems that males have higher self-confidence. To establish whether this is really the case, significance tests have to be carried out (see Table 4). The consequences can be interpreted in two ways.

Table 4. Test statistics of Mann-Whitney U and Wilcoxon W tests grouped by gender (Source: author's compilation

Test statistics	Right after	After a longer period
Mann-Whitney U	22658.500	24135.000
Wilcoxon W	51099.500	52576.000
Z	-1.318	-0.197
Asymp. Sig. (2-tailed)	0.188	0.844

Having the number of elements higher than 30 in the sample, U-statistics can be transferred into Z-statistics, which can then be corrected by the number of occurrences of related ranks. In the first case, $z_U = -1.318 > z_{0.05/2} = -1.96$, so H_0 hypothesis cannot be questioned: at 5% level of significance right after the decision making, there is no difference in self-confidence between men and women.

In the second case, the level of significance turned out to be 0.844, which is > 0.05, so again, there is no evidence for rejecting the null hypothesis: after a longer period of time, there is no difference in self-confidence between men and women.

Based on calculations between a nominal or ordinal (advancement in rank) and a ratio scaled value (certainty), H indicates 0.1804 right after the decision has been made, and 0.1850 after a longer period. The advancement in rank explains the variance of certainty in 3.25% in the first case, and in 3.42% in the second. Having such low values, there is no sense in carrying out hypothesis tests for these. Practically, in both cases, self-confidence is independent of position, so we cannot conclude, for example, that higher rank would mean higher confidence.

Investigating the relationship between the highest educational level and self-confidence, H indicates 0.0491 right after decision making and 0.0118 after a longer period. The educational level explains 0.24% in the first and 0.01% in the second case, from the variance of certainty. Here, if one might be allowed to point out, the variables are even more independent than in the previous case.

Conclusions

Based on the literature, it is quite clear that the current decisions are not equally influenced by the time differences between future results. But decisions have been investigated in connection with future events so far, and not yet in connection with the past. This research was about therefore just to evaluate the past events.

Regarding making business decisions, people tend to have very high self-confidence (81.31%), that is, they are convinced that they are able to select the best (optimal) alternative. Surprisingly, over time, this level of self-confidence does not decrease (significantly). Analyses shows that this holds true regardless of gender.

Differences – neither in position (i.e., the rank), nor in educational level – have an effect on the level of certainty. These are unexpected results because one could have assumed that (i) the farther one goes up the corporate ladder, the more certainty can be observed about one's decisions and (ii) the higher qualification one has, the more certain one can be.

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SOCIAL BEHAVIOR OF SCHOOLTEACHERS OF LATVIA AND RUSSIA IN THE STRUCTURE OF TEACHER PROFESSIONAL IDENTITY

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Abstract. The article presents the results of the international study of the professional identity of schoolteachers of Russia and Latvia. In the study, the six component model of the content of the teacher professional identity (TPI) is used. According to this model, in 2017, the questionnaire "School Teacher Professional Identity" was created and international survey organized, in which 437 schoolteachers from Latvia and the Smolensk region of Russia participated. The aim of this article is to analyze the data of the two national samples for the 6th component of TPI: "Professionally Determined Social Behavior". This behavior is not connected with the implementation of direct professional duties, but corresponds to the philosophy of the profession: taking up the mission of educating community, active involvement in social life, participation in formulation and solution of social problems having pedagogical aspects and unselfish professional help to those who need it. To process the data, statistical methods were used. On the whole, items of the component received relatively high scores in both national samples. Certain differences in the data of Latvian and Russian teachers as well as urban and rural subgroups of both countries are observed. High dispersion of data shown in this component indicates that the professionally determined social behavior is the most acute and controversial aspect of TPI; therefore, the elaboration of optimal ways and tools to strengthen TPI should be based on an in-depth study of social behavior of schoolteachers.

Keywords: Professional identity (PI); professionally determined social behavior; structural model of the PI content

JEL Classification: I21; J24; M14

Introduction and Literature Review

It is difficult to overestimate the role and influence of schoolteachers in the modern society. They are key persons in the construction of the future society (Tateo 2012, Cappy 2016, Switala 2016, Voinea, Palasan 2014, Murphy 2013) and the most numerous professional groups engaged in the intellectual work: there are approximately six million preschool- and schoolteachers in the European Union (Education and training in the EU 2017).

In the last 30 years, an "anthropological shift" is observed in the research on teaching. In addition to the ongoing research on theory and practice of the modern learning/teaching process (teaching and upbringing methodology, didactics in different subject fields, teacher training and professional development, inclusive teaching, teacher's behavior in classroom, etc.), numerous works devoted to the teacher's personality have appeared. The fact that the teacher professional identity (TPI) has become a separate research field is also a consequence of this shift.

The professional identity (PI) can be briefly defined as a constantly evolving integral unity of the personal and professional "I". Compared with other professions, the symbiosis of the personal and professional seems to be most clearly manifested in the teaching profession. Teachers' personal life interweaves with their work extremely closely (Clandinin, Huber 2005, Goodson, Cole 1994, Bukor 2011, Zembylas 2018). As noted by I.F. Goodson, "we invest our self in our teaching" (Goodson 2014).

Among the aspects of TPI that have been actively studied in the last decade are TPI essence (Tateo 2012, Ilyushin, Azbel 2017, Mikelsone *et al.* 2014), TPI content (Buitrago-Bonilla 2017, Hsieh 2015, Li 2016, Medveckis 2016), TPI forming and development (Vangrieken et al., 2017, Prytula, Weiman 2012; Aykac *et al.* 2017), connection of TPI and professional performance (Delima 2015; ATL 2015, Hsieh 2015; Koutouzis, Spyriadou 2017, Olsen 2016), changes in the teachers' PI connected with the ongoing educational reform (Buchanan 2015, Olsen, Buchanan 2017).

However there are areas of TPI that has not received due attention of researchers so far. One of them is teacher's behavior after hours. The teacher's lifestyle, her/his individual latent identities and cultures, and social activities outside school have a significant impact on her/his practice and views of teaching (Goodson 2014). Teachers' influence on the society is not limited by how and what they do in classroom: teachers' social activities not connected directly with performance at school are also important. This is one of the reasons that the influence of the teacher community on the society is wider than that of other professional communities (Aggarwal 2009).

In this study, the professionally determined social behavior is understood as out-of-service behavior (not connected with the implementation of direct professional duties), which corresponds to the philosophy of the profession and includes actions and inclinations that make teachers capable to bring the philosophical principles of the profession into life (Shpona *et al*. 2016). The professionally determined social behavior is based on the following principles:

- taking up the mission of educating the community (not only their own pupils)
- active involvement in social life
- protection of the interests of the profession at various meetings, in public discussions and conversations
- cooperation with state and non-governmental organizations for the sake of the public good
- unselfish professional help to the people who need it
- participation in formulation and solution of social problems having pedagogical aspects (*ibid*)

The aim of this article is to analyze and compare the professionally determined social behavior of schoolteachers from Latvia and Smolensk region (Russia) using the technique elaborated in the Latvian-Russian research project "Professional Identity of Today's Pedagogue".

The obtained results show that in general, Latvian and Russian teachers highly appreciate their social mission and actively participate in its implementation. However, the high dispersion of respondents' answers indicates great diversity of personal approaches, which depend on respondent's circumstances of life and work, and his/her personal hierarchy of values. Not all representatives of the pedagogical communities of Latvia and Russia either fully realize the social mission of the profession or actively implement it in their everyday life; this is mainly a matter of teacher's personal choice.

High dispersion of data shows that the professionally determined social behavior is an acute and controversial aspect of TPI. The elaboration of optimal ways and tools to strengthen TPI should be based on in-depth study of this aspect.

Methodology

In the Latvian-Russian research project "Professional Identity of Today's Pedagogue", which has been going on since 2014, teachers' social behavior outside school is considered as an important part of their PI. One of the aims of the project is to study the content of TPI. Based on the scientific literature on the topic (Beijaard et al. 2004, Emerson 2010, Goodson 2014, Woo 2013, Delima 2015, Hsieh 2015), the hypothetical structural model of content of the pedagogue's PI was created. The model includes 6 major structural components: Philosophy of the Profession, Professional Knowledge, Professional Roles, Professional Attitude to Work, Cooperation with Colleagues and Professionally Determined Social Behavior (Shpona *et al*. 2015). On the base of the model, the questionnaire "University Teachers' Professional Identity" was elaborated (the authors A. Shpona, M. Vidnere, J. Jermolajeva) for the diagnostics and balanced evaluation/self-evaluation of the TPI. In 2015, the relevance and reliability of this technique was testified in the survey of university teachers from Riga and Smolensk, in which 198

respondents participated (Shpona *et al*. 2016; Jermolajeva, Bogdanova 2017; Jermolajeva *et al.* 2017; Jermolajeva, Silchenkova 2017).

At the final stage of the project, the TPI structural model was used to test schoolteachers. The researchers A. Shpona, M. Vidnere, J. Jermolajeva, T. Bogdanova, and S. Silchenkova elaborated the questionnaire "School Teacher Professional Identity". As the questionnaire for university teachers, it consists of 6 blocks of items (according to the number of structural components of the TPI content model), 10 items in each block. The 6th block concerns the professionally determined social behavior of teachers. Based on the aforementioned principles of this behavior, the following statements were proposed for respondents' evaluation in the range from 1 (strong disagreement) to 6 (complete consent):

S1. The teacher's profession is still highly respected in the society.
S2. I participate in socially significant events: elections, local and national holidays, cultural and sport events.
S3. I support non-governmental organizations and participate in their activities.
S4. The joint efforts of teachers can reduce the negative phenomena of social life: aggression, criminality, moral crisis and consumerism.
S5. I do not stop being a teacher after hours: I gladly consult people, do not pass by situations that call for my participation.
S6. I participate in philanthropic / volunteer work that requires my professional experience.
S7. I try to contribute to public awareness of new ideas and achievements in my professional field.
S8. I protect the interests of my profession at various meetings, in public discussions and conversations.
S9. I use my pedagogical experience to identify social problems and seek ways to solve them.
S10. The teacher's duty is to enhance the culture of behavior in the community.

The present study is based on the survey "School Teacher Professional Identity", in which 437 schoolteachers from Latvia and the Smolensk region (Russia) participated (April–May 2017). The representativeness of the samples was provided using a typical (stratified) repetition-free method of creation of samples (Spirina, Bashina 2012). The general population was divided into 2 strata: urban school teachers and rural school teachers; individual respondents were randomly selected from each stratum. Over 20 schools in both national groups participated. Table 1 shows some characteristics of the samples from the demographic part of the questionnaire.

Table 1. Mean age and work experience of respondents in Latvian (LV) and Russian (RU) samples
(Source: authors' compilation)

Indicators	Country	Urban schools	Rural schools	All
Quantity of respondents	LV	182	53	235
	RU	96	106	202
Age (mean)	LV	48.4	47.9	48.2
	RU	46.7	46.8	47.0
Work experience, years (mean)	LV	22.8	22.2	22.7
	RU	22.8	26.5	24.6

The reliability of the study was determined using statistical methods with a significance level of 0.05. Reliability of the samples was evaluated by calculating the sampling error. The corresponding indicators are 6.4% for the Latvian sample (235 participants, 1% of the general population) and 6.8% for the sample of the Smolensk region (202 participants, 3% of the general population). These sampling error values are considered allowable for the pilot study (Yadov 2007). Reliability of the questionnaire is tested by Cronbach's Alfa method. For the two main groups of respondents and four subgroups (urban/rural teachers), Cronbach's Alfa coefficients are in the range from 0.77 up to 0.97, which testifies the acceptable reliability of the used technique.

For each item of the 6th TPI component, mean rates, dispersion, standard deviation, statistical mode, and coefficient of variation were calculated for the two national samples and the subgroups of urban and

rural teachers. Inter- and intra-component correlations were checked as well. In the cases when mean values were not reliable enough (due to coefficient of variation more than 33%), the analysis of the statistical mode was used.

Results

The check by the Mann-Whitney U criterion shows that between the two national samples not divided into subgroups, there is no statistically significant difference in the average ratings of the component as a whole (Table 2). This suggests the relevance and universality of the model of TPI. However, the similarity of data of Latvia and Russia could be explained in another way, for example, by the long-standing coexistence of these countries in the Soviet Union. Therefore, additional survey is required with respondents' samples from other countries in order to assert universality of the model more definitely.

Table 2. Mann-Whitney U-test for Latvian and Russian data on TPI component "Professionally Determined Social Behavior" (Source: authors' compilation)

Russian sample (the criteria below are significant for p < 0.05)										
	Rank Sum 1	Rank Sum 2	U	Z	p-level	Z	p-level	Valid N 1	Valid N 2	2*1 sided exact p
Latvian sample	19.00	36.00	8.00	0.57	0.57	0.57	0.57	3	7	0.67

Despite the similarity of the results on the whole, certain distinctions are revealed in the two countries respondents' views on particular issues (Fig. 1, Table 3). There are also some differences between the data of rural and urban teachers in each country (Tables 4, 5).

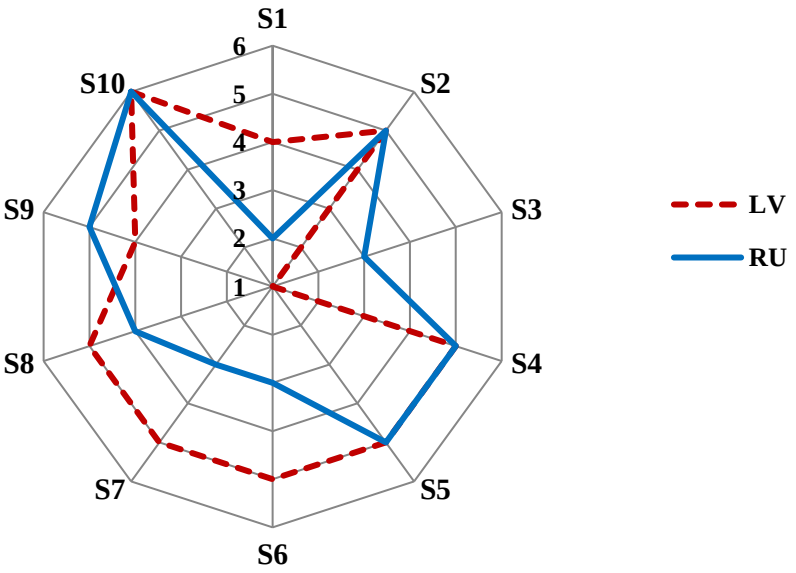

Fig. 1. Mode for items of TPI component "Professionally Determined Social Behavior" in Latvian (LV) and Russian (RU) samples (Source: authors' development)

The greater discrepancy of answers in this TPI component stands out compared with the statistics for other components. Here, the dispersions and standard deviations of the data are higher than in other blocks. In both national groups and each of the 4 subgroups, the data for 5 (sometimes 6) items of 10

are dispersed so much that the coefficients of variation are more than 33% (Tables 3–5). In these items, the calculated mean values are not typical for the respondents' views on the related issues (Spirina, Bashina 2012); therefore, the values of the statistical mode of answers are more significant for the analysis.

High dispersion of views indicates that professionally determined social behavior is the most acute and controversial aspect of TPI. Therefore, the elaboration of optimal ways and tools to strengthen TPI should be based on the in-depth study of this component.

Table 3. Statistical indicators for items of component "Professionally Determined Social Behavior" in Latvian (LV) and Russian (RU) samples (Source: authors' compilation)

Items		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Component as a whole
Mode	LV	4	5	1	5	5	5	5	5	4	6	**5**
	RU	2	5	3	5	5	3	3	4	5	6	**5**
Mean value	LV	3.26	4.81	3.18	4.03	4.27	3.76	3.67	4.52	4.20	4.88	**4.06**
	RU	3.16	4.48	3.09	4.03	4.65	3.26	3.54	4.19	4.26	4.97	**3.97**
Standard deviation	LV	1.35	1.15	1.69	1.34	1.31	1.61	1.51	1.20	1.27	1.09	**1.47**
	RU	1.53	1.35	1.57	1.50	1.27	1.64	1.41	1.36	1.27	1.09	**1.54**
Coefficient of variation (%)	LV	41.27	29.83	53.26	33.28	30.71	42.76	41.21	26.54	30.25	22.33	**36.38**
	RU	48.32	30.02	50.75	37.28	28.23	50.2	39.8	32.51	29.84	21.98	**38.81**

The analysis starts with items, where the modes of answers of the Latvian and Russian teachers noticeably differ: S1, S3, S6, S7 (Fig.1, Tables 3). It is in these items that the coefficients of variation are the highest (namely, about 40% or even higher) in both national samples and all subgroups (Tables 3–5). The large dispersion means that the teacher's views on the questions are very different and depend on personal circumstances. However, the analysis of mode helps to see some peculiarities in the distribution of teachers' answers and make certain generalizations.

Table 4. Statistical indicators for items of component "Professionally Determined Social Behavior" in urban (Urb) and rural (Rur) subgroups of Latvian sample (Source: authors' compilation)

Items		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Component as a whole
Mode	Urb	2	5	1	5	5	5	3	5	4	6	**5**
	Rur	4	6	3	4	5	4	5	5	5	6	**5**
Mean value	Urb	3.22	4.78	3.08	4.03	4.3	3.69	3.6	4.47	4.12	4.93	**4.03**
	Rur	3.4	4.92	3.49	4.06	4.15	4	3.92	4.7	4.47	4.7	**4.18**
Standard deviation	Urb	1.33	1.16	1.76	1.35	1.25	1.59	1.53	1.2	1.27	1.03	**1.48**
	Rur	1.41	1.09	1.4	1.34	1.51	1.66	1.43	1.19	1.25	1.26	**1.44**
Coefficient of variation (%)	Urb	41.27	24.35	57.15	33.47	29.03	43.06	42.65	26.9	30.79	20.9	**36.82**
	Rur	41.38	22.12	39.98	32.94	36.41	41.6	36.33	25.25	27.95	26.92	**34.34**

In the item on the authority of the teaching profession in the society (Item S1, Table 3), the Latvian teachers, on the whole, are more or less positive (mode 4, "rather agree"), whereas Russian pedagogues are, at best, doubtful of this issue (mode 2, "disagree"). At the same time, the analysis of the answers of rural and urban teachers demonstrates statistically significant differences between the subgroups in both countries (Tables 4, 5). Latvian urban teachers do not feel due public respect for their profession (mode

2, mean 3.22), unlike their rural colleagues, whose indicators are more positive (mode 4, mean 3.40). In Russia, the situation is completely opposite: the rural teachers are doubtful of the credibility of the teaching profession (mode 2, mean 2.92), while the indicators of their urban colleagues are higher (4 and 3.62, relatively). The fact of discrepancy of answers of rural and urban teachers in Latvia and Russia requires additional investigation for deeper analysis of the teachers' views on this question. However, the data of the survey suggest that in both countries there is neither national strategy nor common position of teachers on the question of authority of the teacher work.

Table 5. Statistical indicators for items of component "Professionally Determined Social Behavior" in urban (Urb) and rural (Rur) subgroups of Russian sample (Source: authors' compilation)

Items		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Component as a whole
Mode	Urb	4	5	5	5	5	4	4	4	5	4	**5**
	Rur	2	5	3	5	5	3	3	4	4	6	**5**
Mean value	Urb	3.62	4.26	3.52	3.95	4.52	3.05	3.66	3.93	4.24	4.74	**3.95**
	Rur	2.92	4.6	3.13	4.14	4.75	3.4	3.52	4.32	4.39	5.14	**4.03**
Standard deviation	Urb	1.78	1.63	2.32	1.77	1.34	2.26	1.81	1.85	1.59	1.11	**1.95**
	Rur	2.47	1.82	2.53	2.39	1.58	2.95	2.18	1.65	1.53	0.94	**2.48**
Coefficient of variation (%)	Urb	36.88	30.01	43.35	33.69	25.64	49.27	36.80	34.65	29.73	22.19	**35.39**
	Rur	53.74	29.32	50.83	37.32	26.51	50.54	41.92	29.72	28.24	18.87	**39.12**

For Items 3 (participation in non-governmental organizations) and 6 (participation in charitable foundations and volunteer movement), the coefficients of variation are also high in both national groups and all subgroups. Together with the values of mode and arithmetical means, these high coefficients indicate that only few representatives of the professional communities of both countries are involved in the corresponding activities. Russian teachers, especially in rural areas, seem wary of them. In the whole Russian sample as well as in the Russian rural subgroup, the mode for these items is 3 (Tables 3 and 5), which means "neutral attitude, but rather disagree". Taking into account the teachers' average age (47 years), negative attitude towards non-governmental organizations and actions might be inherited from the Soviet period, when the state tried to subdue and control every self-initiative of people. To some degree, the same attitude remains in Russia today. As for the low rating for Item 6, one can comment that charity is not topical for Russian teachers because of their small salaries, whereas volunteer movement is not popular among them because of the shortness of history of this tradition in the modern Russia and, probably, because of the lack of free time. Compared with rural colleagues, Russian urban teachers are more active in this sphere of life: modes for items 3 and 6 in this subgroup are 5 and 4, respectively.

In Latvia, Item 6 has a higher rating in the whole sample, in urban and rural subgroups (modes 5, 5 and 4, correspondingly; Tables 3 and 4). At the same time, the Latvian sample demonstrates surprisingly negative attitude to the non-governmental organizations (Item 3): in the whole group, urban and rural subgroups, the values of mode are 1, 1 and 3 (rate 1 means "strongly disagree"). Since the average age of the Latvian teachers is one year more than that in the Russian sample, the aforementioned influence of the Soviet past cannot be excluded. However, it seems obvious that the experience of recent decades, when Latvia pursued the way of democratic social development in its neoliberal variant, has only deepened the disappointment of Latvian teachers in non-governmental organizations. The subgroup of Latvian urban teachers shows especially negative attitude; at the same time, here the coefficient of variation reaches the record value of 57.15%. One may conclude that the respondents of both countries put their own individual meaning in the term "non-governmental organization"; evidently, they do not include their own trade union in this notion (though most of them are its members). This shows weakness of trade unions both in modern Latvia and Russia. Probably, people believe that they are official organizations launched by the state, as it was in the Soviet Union.

Item 7 of the block "Professionally Determined Social Behavior" concerns educating the community. According to the obtained data, this part of the professional mission has lost its high significance in the Russian teacher's view: in the whole Russian sample, urban and rural subgroups, the values of mode are 3, 4 and 3 (Tables 3 and 5). Losing the mission of educating the community is especially noticeable for the Russian rural teachers, which contradicts the traditional image of countryside teacher repeatedly and lovingly described in the Russian classical literature and art. On the contrary, in Latvia (Tables 3 and 4), rural teachers evaluate their mission of educating the community higher than their urban colleagues and implement it more actively in practice. In the whole Latvian sample, urban and rural subgroups, the values of mode for Item 7 are 5, 3 and 5. Although the Latvian scores for Item 7 appears to be more positive, in both countries, certain lethargy is observed in the work of teachers in this direction. However, high coefficients of variation indicate that the respondents' approach to the question is markedly individual and the general situation is uncertain. Today, in both countries, every teacher and every educational institution independently decides whether to take up or not to take up the mission of educating the community and choose ways to its implementation.

The data for the several questions of the component "Professionally Determined Social Behavior" are well agreed, and the corresponding items have statistically reliable and high enough scores. These items are the following (see Tables 3–5): participation in socially significant events (S2, mode 5 in both national samples); readiness to pedagogical counseling after hours (Items S5, mode 5 in all subgroups); protecting the interests of the profession at various meetings and in public discussions (S8, modes 5 and 4); discovering and solving social problems (S9, modes 4 and 5); the duty to enhance the culture of behavior in the community (S10, mode 6 in both national samples). The last item has especially high and well-agreed scores. In Latvia, this element of the educating mission (unlike the dissemination of knowledge, Item S7) does not lose its priority either in cities or in the countryside. In the Smolensk region, however, the answers of the urban and rural teachers to this question differ significantly. Russian rural teachers consider the promotion of cultural behavior to be of the first priority (it should be noted that no other of 10 items of the component received mode 6 in this subgroup), whereas in the urban subgroup the mode for this item is only 4. Compared to their rural colleagues, the Russian urban teachers are more focused on other social problems (Items S3, S6, S7 and S9).

Data analysis leads to the conclusion that in general, Latvian and Russian teachers relatively highly appreciate their social mission and actively participate in its implementation: in both samples and in each of the four subgroups, the mode for the whole set of the questions of the TPI 6th component is 5. However, one can notice some differences in the results of four subgroups. Comparing the arithmetic means of the modes for the whole set of items, one can suppose that the Latvian rural teachers are slightly more active in the social representation of the profession; in addition, this subgroup of teachers shows the minimal coefficient of variation for the component as a whole (Table 6). On the contrary, in the data of Russian rural teachers, signs of social apathy are more obvious than in other subgroups. However, the high coefficients of variation in both whole samples and four subgroups indicate that not all representatives of the pedagogical communities of Latvia and Russia either fully realize the social mission of the profession or implement it in their everyday life. This is mainly a matter of teacher's personal choice.

Table 6. Mode, arithmetic mean of mode, and coefficient of variation (CV) in 4 subgroups for component "Professionally Determined Social Behavior" (Source: authors' compilation)

	Mode										**Mean Mode**	**CV for comp. as a whole (%)**
Items / Subgroups	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**		
LV Urb	2	5	1	5	5	5	3	5	4	6	**4.10**	**36.82**
LV Rur	4	6	3	4	5	4	5	5	5	6	**4.70**	**34.34**
RU Urb	4	5	5	5	5	4	4	4	5	4	**4.50**	**35.39**
RU Rur	2	5	3	5	5	3	3	4	4	6	**4.00**	**39.12**

In both national groups, there is a strong correlation between the TPI 6th component and TPI as a whole: the corresponding Spearman's rank correlation coefficients are 0.73 for Latvian teachers and 0.76 for Russian teachers. This indicates the importance of the component in the general TPI structure. Both national samples also have statistically significant correlations between the TPI 6th component and 5 other components. However, the data of respondents from Latvia and Russia are different in this respect. In the data of the Russian sample, the 6th component has three moderately strong (i.e., in the range of 0.5–0.7) Spearman's rank correlation coefficients: with the component "Professional Roles" (0.58), "Professional Attitude to Work" (0.53), and "Cooperation with Colleagues" (0.60). The corresponding Spearman's correlation coefficients in the Latvian data are relatively high but a little below the moderately strong level (0.48, 0.43, and 0.44). It can be concluded that despite the large dispersion of answers due to individual choice and different circumstances of life and experience, the teachers' understanding of their mission and social responsibility relates to their working duties and professional interaction with colleagues.

In the Russian sample, the connection of the 6th component with other components is emphasized by the three moderately strong correlations between the separate items of this component and certain statements in other components (see Table 7).

Table 7. Spearman's inter-component correlations for items of TPI component "Professionally Determined Social Behavior" (Russian sample)

Statements of TPI component "Professionally Determined Social Behavior"	Correlating statements in other TPI structure components	TPI structural components	Spearman's rank correlation coefficients
"I participate in socially significant events: elections, local and national holidays, cultural and sport events" (2nd item)	"I have made contribution to the improvement of teaching/learning and upbringing methods, but so far there has been no opportunity to introduce it to the pedagogical community"	Professional Knowledge	0.52
"I participate in philanthropic/ volunteer work that requires my professional experience" (6th item)	"My professionalism is primarily in the qualitative teaching of my subject"	Professional Roles	0.50
"I protect the interests of my profession at various meetings, in public discussions and conversations" (8th item)	"I have experience in cooperation with colleagues from other educational institutions and research laboratories"	Cooperation with Colleagues	0.53

The correlations show that the active social behavior of Russian teachers is closely related to their effective professional work. Participation in socially significant events correlates with innovative approach to work and stimulates the exchange of experience with colleagues; public debates on pedagogical problems extend professional contacts and opportunities for cooperation; charity and volunteer work in no way diminish the importance of professional task of qualitative teaching of the subject. According to the well-known folk wisdom, the more one does, the more he gets, and the more extensive his plans are.

In the Latvian sample, the correlations between items of the 6th component of TPI and statements of other components are either statistically insignificant or weak. An interpretation of the difference in the data correlations between the two professional communities requires a separate study. The number and value of correlations can be influenced, directly or indirectly, by national pedagogic traditions, the greater or less solidarity in the two national pedagogical communities, the different levels of social activity in the contemporary Russian and Latvian societies, and so on.

The interrelations between the items within the component have also been checked in the study. There is one common moderately strong intra-component correlation between the teachers' answers to the statement "I protect the interests of my profession at various meetings, in public discussions and conversations" (Item 8) and the statement "I use my pedagogical experience to identify social problems and seek ways to solve them" (Item 9). The corresponding Spearman rank correlation coefficients are 0.57 for the Latvian teachers and 0.62 for the Russian teachers. This correlation indicates the way chosen by teachers to identify and solve social problems: participation in public discussions and forums, launching public consultations on socially important issues. Today's teacher considers as professionally important not only the education of the next generation, but his own social activities "here and now" as well. He is not yet satisfied with the resigned view on the social progress expressed in the poem "Railway" by the 19th century Russian poet N. Nekrasov: "Only alas – live in that beautiful era / I shall no more, and neither shall you".

In addition to the aforementioned correlation, some other moderately strong intra-component correlations are revealed in the Russian data, 5 correlations in total (Table 8).

Table 8. Spearman's intra-component correlations for items of TPI component "Professionally Determined Social Behavior" (Russian sample)

Statements of TPI component "Professionally Determined Social Behavior"	Correlating statements	Spearman's rank correlation coefficients
"I do not stop being a teacher after hours: I gladly consult people, do not pass by situations that call for my participation" (Item 5)	"The joint efforts of teachers can reduce negative phenomena of social life: aggression, criminality, moral crisis, consumerism" (Item 4)	0.57
	"The teacher's duty is to enhance the culture of behavior in the community" (Item 10)	0.51
"I try to contribute to public awareness of new ideas and achievements in my professional field" (Item 7)	"I participate in philanthropic / volunteer work that requires my professional experience" (Item 6)	0.59
"I use my pedagogical experience to identify social problems and seek ways to solve them" (Item 9)	"I try to contribute to public awareness of new ideas and achievements in my professional field" (Item 7)	0.51
	"I protect the interests of my profession at various meetings, in public discussions and conversations" (Item 8)	0.62

According to the Russian pedagogues, being a teacher not only in school but after hours as well means the following: not to miss the negative social phenomena (aggression, crime, manifestations of immorality); to intervene in situations that call for participation; and try to enhance the culture of behavior in the community. The mission of educating the community is primarily connected with social and pedagogic assistance to those who need it, active participation in formulating social problems and discovering ways of solving them, protecting the education and upbringing values.

Once again, attention is drawn to the fact that there are more correlations of different types in the Russian data than in the Latvian data. Thus, it can be concluded that compared to the Latvian teachers, the component "Professional Representative Behavior" plays a more important role for the Smolensk region teachers in the general structure of TPI, and influences other structural components to a greater degree. For the detailed analysis and interpretation of this fact, an additional study is necessary. Differences in correlations might arise if the sample of Russian teachers were far more polarized than the Latvian one, i.e., the leading group of Russian teachers with the stable and balanced professional identity markedly stood out among others, while in the Latvian sample the features of the strong professional identity were distributed among respondents more uniformly.

The data of this survey have been compared with the data of the study "Professional Identity of Teachers of Riga and Smolensk Higher Education Institutions" carried out in 2014–2016 (Шпона *et al*., 2016). The polar situation in the two countries has been found out. Namely, the social activity shown by the academic staff of Riga universities is not supported by the Latvian teachers, whose professionally determined social behavior is significantly less active. On the contrary, the social passivity of Smolensk higher school teachers is not characteristic to the schoolteachers of the Smolensk region (especially the city teachers), who take up a greater role in social processes. For the analysis of this result, an additional study is required.

The results of the study can be used in the construction of out- and in-service teacher training courses. The identified problems allow to pay due attention to them and thus contribute to formation and correction of young teachers' PI.

The content of TPI is a subject to further research. In the future, it is planned to explore the development of PI and, more specifically, professionally determined social behavior at several levels: teaching students, beginning teachers, and experienced teachers. It would be interesting to research the relationship between teacher's professionally determined social behavior and some other personal phenomena, for example, her/his competencies and personal traits.

Conclusions

On the whole, the Latvian and Russian teachers highly appreciate their social mission and actively participate in its implementation. However, the professionally determined social behavior of teachers is highly individual. The dispersion of data is very high in both national samples, which indicates great diversity of personal approaches dependent on circumstances of life and work of the respondent, and his/her personal hierarchy of values. Not all representatives of the pedagogical communities of Latvia and Russia fully realize the social mission of the profession or actively implement it in their everyday life; this is mainly a matter of a teacher's personal choice.

The highest dispersion of data, compared with the other components of TPI, indicates that professionally determined social behavior is the most acute and controversial aspect of the schoolteachers' professional identity. Therefore the elaboration of optimal ways and tools to strengthen TPI should be based on in-depth study of this component.

Compared to the Russian sample, the Latvian teachers' indicators are slightly higher. However, in the Russian sample, the 6th component of TPI has more intra- and inter-component correlations, that is, it plays a more important role in the general structure of Russian teachers' professional identity and influences other structural components to a greater degree.

In both countries, there are some discrepancies between the data of urban and rural teachers; clarification and interpretation of this fact requires additional research.

Comparison of the results of this study with the results of the research "Professional Identity of Teachers of Riga and Smolensk Higher Education Institutions" shows that the social activity of academic staff of Riga universities is not supported by the Latvian teachers, whose professionally determined social behavior is less active. On the contrary, the social passivity of Smolensk higher school teachers is not characteristic to schoolteachers of the Smolensk region, who take up a greater role in social processes. For the analysis of this fact, an additional study is required.

Some more particular conclusions:

The question about teacher's duty to enhance the culture of behavior in the community has especially high and well-agreed scores.

Certain decline is observed in the activity of teachers in educating the community.

In both countries, there is neither a national strategy nor a common position of teachers on the question of the authority of schoolteacher work.

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A FRAMEWORK FOR MULTIDISCIPLINARY BUSINESS SIMULATIONS

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Abstract: In this paper, the design and introduction of a framework for multidisciplinary business simulations at the School of Public Administration of Kehl University will be presented. Within Kehl's Public Administration study program, various subjects like organization, law, human resources, computer sciences, finance, psychology and economics are supported in an interdisciplinary way. Both theoretical and scientific skills as well as soft skills such as teamwork, project management and coordination will be further developed by using an interdisciplinary approach. A framework for multidisciplinary business simulations has been developed to support this interdisciplinary approach. The framework integrates realistic and practical simulations of interdisciplinary case studies into the study program of Public administration at Kehl University. In order to reduce costs for case study development, the framework offers a generic case study pattern. This pattern was purposefully developed and covers very different disciplines in the best possible way so that the students can conduct simulations that are realistic and possible during their studies. Further, two different simulation implementations of the case studies were designed within the framework for multidisciplinary business simulations. A short-term simulation intends to check the ongoing learning success. A long-term simulation aims for giving students feedback concerning their skills just before graduating. The case studies based on the generic case study pattern come from a wide variety of public administration tasks. Examples of currently conceived case studies include e-invoicing, IT-infrastructure for schools and IT-office workplaces. The case studies were developed together with practitioners from municipalities and local agencies in order to create realistic simulations. This addresses the actual complexity of the future working environment of students. The comprehensive application of knowledge learnt in different subjects motivates students to work on these case studies.

Keywords: Business simulation software; multidisciplinary lectures; public administration

JEC Classification: I23; C88

Introduction

The University of Applied Sciences in Kehl was founded in 1971 and since then, it has been educating administrative specialists and future executives in public administration. In Germany, public administration includes all institutions, facilities and enterprises, which carry out the tasks set down by the government and the legislature. German public administration embraces, among other tasks, the matters of security, traffic, education and culture, social services and health care as well as finance and economy. Upon successful completion of the program, one qualifies for entry into the German Civil Service and is granted a Bachelor of Arts degree. Graduates work after their training either in one of the over 1,100 municipalities in Baden-Wuerttemberg or in one of the 35 regional districts or in the state administration of Baden-Wuerttemberg. But former students can be found in the entire Federal Republic as well. Kehl University also offers three master's degree programs: European 'Public Management', 'Cluster Management' and 'Public Management'.

In general, study programs in public administration have to combine multiple disciplines in order to address the needs of modern states: law, management, human resources, psychology, economics, finance & budget, organization, computer sciences and project management. Soft skills like teamwork and conflict resolutions are not only assets but basic requirements to work as a successful civil servant. In addition, studies in public administration should not only provide for a sound theoretical knowledge,

but have to be related to practice as well (Lynn 1996; Shafritz et al. 2003).

The need for practical solutions is also proved when looking at the four intellectual traditions to the study of and the discourse about government (Raadschelders 2008):

- A study for the development of practical wisdom
- A study for the development of practical experience
- A study for the development of scientific knowledge
- A study of relativist perspectives

Only one tradition is exclusively related to theory and science. New emerging trends, for example, adaptive public management (Mitchell, Mitchell 2016) are combining those traditions at a horizontal layer with an emphasis on practical solutions.

Education institutions face rapid changes. Advances in information technology have transformed both the way students retrieve and exchange information and how they communicate with one another and their instructors. Learning skills and building knowledge are changed by the use of information technology as well (Davidson, Coldberg 2009). Though traditional teaching styles are still at work, traditional 'internal' civil service training seems to have given way to more academic and 'open' programs (Reinhard 2018). Educators in public administration have to regularly explore innovative tools and approaches to exploit its potential for public administration education in order to provide students with an up-to-date learning experience.

All in all, study programs in public administration have to face very complex and changing requirements and educational changes. The implementation of E-learning systems might be one way to cope with these changes (Umek 2017). Using interactive computer simulations as an innovative tool for education might be a further sensible way to address modern public administration's multidisciplinarity and complexity. Interactive computer simulations provide an interactive learning environment. Students can apply what they just have just learned into dynamic scenarios and uses studies respectively. Advantages are instant feedback, reflections about failures and improvements through trial and error, and explorations of alternative outcomes (Kriz 2003, p. 505).

Within public administration study programs computer simulations are attracting more and more attention. For example, computer simulations have been used in helping to understand and improve, for example, emergency management (Barrett et al. 2011; Desouza, Lin 2011), accounting (Eckhaus 2017), traffic management (Kane 1999), urban planning (Borning et al. 2007), environmental management (Learmonth et al. 2011), and public service delivery (Johnston et al. 2010; Kovacic, Pecek 2007). The increasing interest in computer simulations is due to the fact that they help preparing public administrators to cope with complex challenges like uncertainty in politics and legal regulations, lacking acceptance, stakeholder interdependencies, budget cuts and slow feedback cycles. The interactive and replicable collaborative government simulation (Merritt, Kelley 2018) based on the 'collaborative governance' framework (Ansell, Gash 2008) has been proven that such an approach is meaningful.

Brain research results suggest strongly that repetition, elaboration, pattern recognition and so on are important variables for learning success. Looking at a topic from different perspectives and studies, spaced out over multiple sessions and time, are crucial (Spitzer 2008). Hereby, the differences between long-term, short-term and working memory (Cowan 2008) have to be taken into account to provide for a sustainable learning success.

The objective of this paper is to propose a framework for multidisciplinary business simulations which implements the above mentioned research results – modern public administration's interdisciplinarity and complexity, rapid changes in education, brain research results emphasizing repetition, elaborations, pattern recognition and the positive effects of simulations in education.

The basic idea of the framework is the use of case studies for simulations. Case studies are generated on the basis of a generic pattern. This pattern is provided by the framework for multidisciplinary business simulations. One and the same case study is used for short and long-term simulations. Only the focus of

the simulations is different. Whereas in short-term simulations, only one discipline is considered, in long-term simulations, all disciplines addressed in the case study are taken up and combined by specific questions. The following figure gives an overview of the framework for multidisciplinary business simulations.

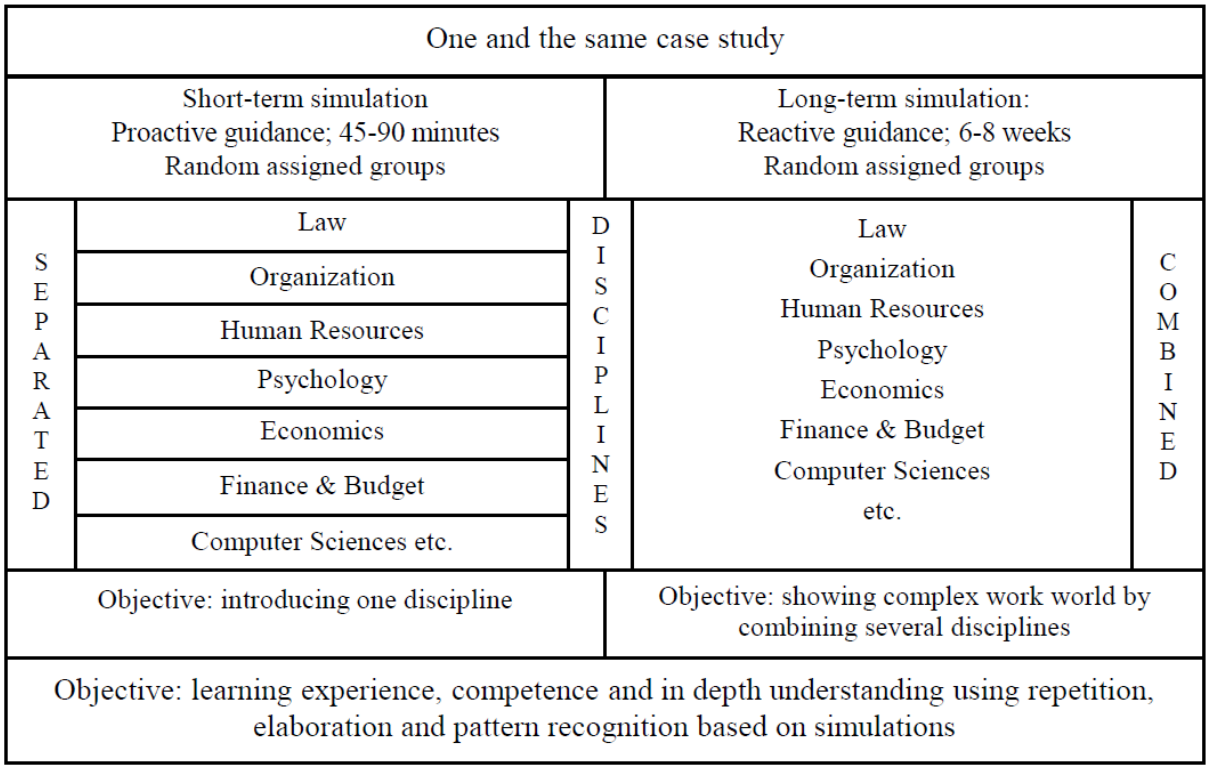

Fig.1. Overview: framework for multidisciplinary business simulation (Source: author's representation)

The next chapter describes the framework's generic pattern for case studies and some derived case studies. A further chapter contains a detailed description of the framework itself and discusses short and long term simulations in more detail. A conclusion and outlook regarding further research activities and the framework's evaluation finalize the paper.

Case Study – A Generic Pattern and Examples

In order to provide for high-quality simulations, a generic pattern for case studies has been developed, which covers all disciplines of the public administration study program of Kehl University, though the main focus may vary case-by-case.

The pattern is designed such that students have to act as project managers within a project managing board. Three to five students are randomly allocated to the project managing board. This may lead to team conflicts. This is deliberate. Every case study starts with the description of the municipality. This description may vary by size of the city and political settings, for example, new elected mayor, new elected city council, approaching elections and so on. After describing the municipality settings, the mission and the objectives of the project are outlined. The objectives may vary from procurement and implementation of IT systems, implementation of new budget regulations to business process reengineering.

Though the topics are different, the structure is always two-tiered. Firstly, there is a pilot project with the duration of nine to twelve months. Based on the evaluation of the pilot project, the successive implementation within the municipality's organization has to be conducted within a time period of twelve to eighteen months. Parameters like awarding authority, for example, council, mayor, city department and so on, members of the project's supervisory board, timeline, allocated budget and further

members of the project team, for example, software developers, IT administrators, users, professionals in the field of application, business process reengineering experts and so on are outlined, if applicable specific information about the departments involved in the project is given.

The simulation starts six to nine month after the project's start and three months prior to when the evaluation of the pilot project is due. After a very encouraging start of the project, the members of the project management board have to face serious problems: uncertainty in legal regulations, for example, concerning procurement procedures or work council's right to have a say, lack of user acceptance or people having grave doubts about the objectives' reasonableness, for example, users, council members and so on. The task for the members of the project management board is to analyse the situation. In particular, they have to consider whether changes to the project parameters are necessary, for example, regarding members of the supervisory board, pilot departments, budget calculation, timeline and so on. The project management board has to question the objectives, for example, expectations on return of investment, juridical assumptions and so on. The results of this analysis have to be outlined in front of the (virtual) city council in a twenty to thirty minutes' presentation followed by a ten to fifteen minutes' discussion. In particular, it is expected that the students discuss the advantages and disadvantages of their propositions. In addition, the students have to write a draft proposal. Actually, there are no 100% perfect solutions for the problems the project has to face according to the case study's description. The skill to reason advantages and disadvantages of the proposed solution is one of the main outcomes of the case study from an educational point of view. The following figure shows the scheme of the generic pattern for case studies.

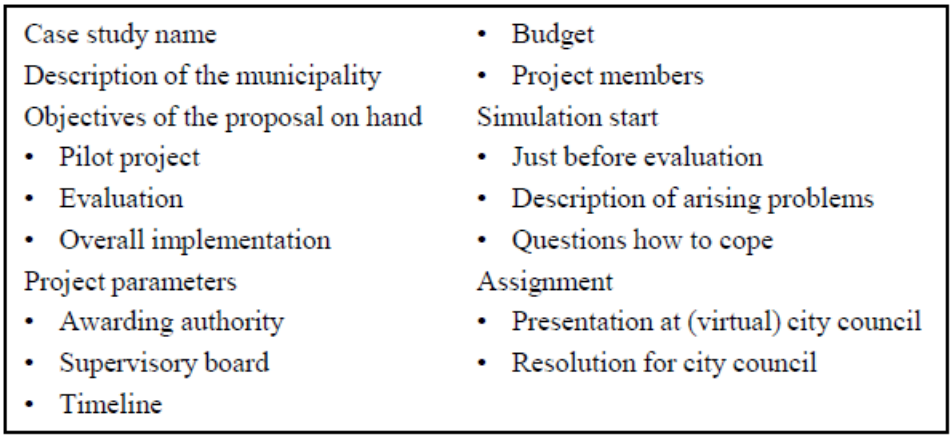

Fig.2. Scheme of the generic case study pattern (Source: author's representation)

The generic case study pattern addresses problems affecting several disciplines, though the intensity with which a discipline is looked at may vary depending on the concrete case study on hand. Recruitment, work council, procurement, SW licenses and municipal budget are examples that require sound knowledge in law. Dealing with a lack of user acceptance implies that change management methods have to be applied. Organizational and management skills in structural organization, process-oriented organization, leadership management and business process reengineering are addressed as well. Furthermore, conflict resolution and dealing with resistance belong to the psychology studies of Kehl's public administration program. This and management also play a role in the overall project management, for example, leadership, conflict resolution, teamwork, collaboration and so on. Cost benefit analysis, profitability calculation and risk analysis are addressing students' knowledge in economics. In addition, political circumstances have to be taken into account in order to propose an applicable solution, though it might not be the best one from a theoretical point of view.

More than fifteen case studies have been developed based on the generic case study pattern. Three of them are described shortly. They combine multiple disciplines and show similar but different characteristics: 'e-invoicing', 'IT-office workplaces' and 'Cloud-based IT-infrastructure for schools'.

The case study 'Cloud-based IT-infrastructure for schools' has two specific issues to be considered.

Firstly, there is a lack of user involvement. The project's mission was decided on by a state agency using a top-down approach. Neither teachers nor pupils are involved in the design of the IT infrastructure or the selection of the IT learning tools. Some representatives of these groups should be at least members of the project team or even of the project's supervisory board. Secondly, the objective of the project focuses on technology. There's no work package aiming to develop the application processes. It is up to the users how they will or – what is more likely – will not use the IT learning tools. The reluctance to use the system is high. The application of change management methods is necessary. The project also has to face financial problems since the implementation of the IT infrastructure is funded by the state agency but no money for the maintenance of the IT infrastructure is provided either by state or municipality. Political and financial issues have to be handled in detail. Finally, reengineering of educational processes using IT implies legal issues regarding, for example, privacy and employees' right to have a say.

At first glance, the project 'IT-office workplaces' seems to be straightforward. However, one of the project's objectives is to save money for license fees, since the city council expects a return of investments within eighteen months. The members of the project managing board have to compare Microsoft Office versus Open Office. By doing so, the students have to realize that license fees are just one aspect of a sound cost-benefit analysis. Maintenance, user acceptance and providing interfaces to other applications are crucial for financial success as well. Using a cloud-based solution is also an option for the project 'IT-office workplaces'. In comparison to the case study 'Cloud-based IT-infrastructure for schools', this case study is more IT-related, although skills in economics are a prerequisite for developing reasonable cost-benefit and risk analyses. Nevertheless, sound knowledge in law – license contracts – and organization, management and psychology – change management, lack of user acceptance when introducing a new office tool and so on – are required to develop an adequate solution proposal.

The case study 'e-invoicing' focuses on two aspects: profitability calculation and business process reengineering. Nevertheless, change management and law are crucial for this project as well. In order to benefit most from an electronic billing system, all the departments of a municipality have to be involved. Checking for the technical correctness of bills is a decentralized task. In order to avoid paper and provide for the highest benefit of the system, checking for correctness has to be done within the electronic billing system. Since all the departments have to be incorporated, the risk of lacking user acceptance increases due to the number of involved employees. Employees' right to have a say affects strongly the business process reengineering task. Law knowledge is a prerequisite to develop a sound solution. Last but not least, retrieving sound data as a basis for a profitability calculation is often difficult. Assumption needed for the profitability calculation have to be well-founded. Though the political dimension is missing, this case study has its challenges in economics, business process reengineering and change management combining multiple disciplines of public administration studies as well.

Multidisciplinary Business Simulation

Simulation games are used to present a specific conflict situation from the everyday world or the world of work. They are based on case studies. Within a given case study, a certain portion of real life complexity is reduced. Simulation games are dynamic multi-period models. The actual course of the simulation consists of several succeeding cycles. Decisions in one cycle affect the course of the following cycle. Within each cycle, students have the task of operationally manipulating the case study's scenario. Certain predetermined goals have to be achieved. In order to achieve reasonable simulation's outcomes, the students have to plan their tactical approach and adapt it accordingly taking into account the results of each preceding cycle. Though students act reasonably on the one hand, the playful component should not be ignored on the other hand. A game has not only to address cognition but also emotions in order to be successful (Yu-Hui et al. 2009). Though motivation of students is especially high when real world problems have to be solved and team work is required, the later may lead to conflicts as well.

Basically, simulation games contain three consecutive phases: briefing, gaming and debriefing. At the briefing phase, the game master and lecturer respectively will describe the case study. If necessary, the

students can decide on the roles and allocate tasks within the team. Further, the students need some time to read into the case study in more detail. In the gaming phase, the actual execution of the cycles of the simulation game takes place. The decisions to be made within the cycles are decided on by the student teams. The decisions influence the following phases. Positive as well as negative results are addressing the emotions of the teams. The final phase – the debriefing phase – is the most important phase, since it allows for reflecting of the entire game simulation. During the debriefing, each decision of the individual cycle are discussed and evaluated. This last phase also serves to transfer the learning outcomes into the future studies of the students (Ruohomäki 1994).

Case studies can be simulated in two different types of simulation games at Kehl University. The short-term simulation and the long-term simulation:

Short term simulation should be handled within one lesson by a maximum of five students. The simulation can be already used at the beginning of one's study to allow for checking the learning progress over time. The same scenario should always be considered from different perspectives in the various disciplines in order to allow for the best possible learning support to the students by repetition. In order to facilitate the students' work, a number of predefined solutions can be presented to the students for the selection in each cycle of a simulation game, but no grading takes place. Further, based on outlining a comprehensive, interdisciplinary case study from different perspectives, simulations should concentrate only on one discipline. This approach allows a massive reduction in complexity addressing two reasons: it is a short-term simulation of approximately one or two lessons, and secondly, students are at the beginning of their studies. Repetition and pattern recognition are supported by using one and the same case study in various short-term simulations in different disciplines.

While in short-time simulations, lecturers can influence the students' decisions heavily, the degree of freedom is significantly greater in long-time scenarios. The influence of the lecturer is dropping due to the simulations' longer time period. A group of three to five students will complete complex tasks within six weeks while doing the long-term simulation. At the beginning, the lecturer gives a detailed introduction. The case study is outlined and the concrete problem on hand is described and looked at in detail. The presentation of the case study by the lecturer should ideally stimulate the students' imagination and creativity. The students should come up with the first insights with which goals and objectives may have to be addressed within the simulation process. To do so, the group of students has to explore the used study's scenario in both scientific and situational context. In a first step of a long-term simulation, teams need some time to gather information creating a common team information base. Furthermore students have the task to organize themselves, allocate tasks and develop a timeline to perform the simulation.

Long-term simulations are especially useful when students are about to complete their study at Kehl University. The knowledge of various project management disciplines is required because of the simulations' long-term character. At the beginning of students' studies, this knowledge is missing. Project management skills have to be used for decision making in the various simulation cycles and team conflicts may have to be solved. Once the first planning phase is completed, the group can begin to execute, control and evaluate the succeeding simulation steps. Within these cycles, the team has the task to set up different solution alternatives, to compare them and to evaluate them. This should be done ideally in such a way that the student team can process their tasks almost independently without the lecturer's help. The lecturer may give assistance to the students throughout the simulation process, but he will stay in the background. If questions or problems arise, the student team has the task to ask for help actively. After evaluating various alternative solutions, a joint decision must be made by the student team as to which solution has to be used for the next simulation step. Of course, the lecturer is supportive and tries to facilitate the student's reflection process, though he will show no doubts concerning the students' decisions during the simulation process itself.

The didactic assessment of business simulations is that they are 'suitable both for the promotion of general competence in dealing with complex systems and for the support of knowledge and competence acquisition in a sector-specific context' (Kriz 2003). Simulation games are useful in an action-oriented teaching. Above all, simulation games are suitable for the understanding of complex systems as they will occur in the future environment of the students.

However, the course of actions and the learning process must be an inductive one. A sensible starting point is crucial. The developers of a simulation must construct the underlying scenario carefully. A meaningful induction phase has to provide for a sound information basis. This is a prerequisite that students can complete a content-related decision-making process step by step within the simulation aiming at addressing all the objectives and goals outlined in the case study's scenario. Especially in the case of long-term simulations, it is important that the underlying case study is practice-oriented and realistic. The generic pattern for case studies supports the development of meaningful scenarios for simulations, which allow students to solve the simulations' objectives by applying scientific theories and models. The underlying case study should be relevant to future professional situations of students and should enable role identification as well. It will be best if a case study addresses existing problems of the students' future working environment. However, the complexities of the real world of work have to be reduced adequately. The outlined problems have to be solvable with respect to the limits of a simulation as, for example, the students' time and work capacity.

During the last phase of the simulation, both a debriefing and a detailed reflection concerning the students' decisions should be conducted. These activities support both the transfer of acquired skills and knowledge into professional practice and the vocational competence of the students.

Simulations are tools to prepare students for their future world of work. In case simulations are prepared meaningfully and are based on realistic case studies, they offer students the opportunity of being able to try out their skills and knowledge in a safe setting. The students can test themselves by making bold decisions and exploring respective consequences. Since there is no real harm, the students can work experimentally. Students can use and consolidate expertise, but also test social and methodological competence and interact and reflect within the team. All team members are required to participate in the decision making process of each cycle. Ideally, decisions may be made democratically. However, it may be necessary to resolve conflicts within the team. Therefore the ability to work in a team and the competence to deal with conflicts are trained practically during the simulation process.

The fun factor also plays a significant role in motivating the participating students. The game character of simulations allows for a multi-dimensional learning situation, which is both effective and intellectually appealing for the students. Thus, within the social system of a group, students can undertake a creative learning process using the knowledge acquired during their studies. Using long-term simulations studies' learning results can be deepened since not only the intellect but also the emotions of the students are addressed. However, simulations should not be used too often in the classroom or in the study process since those effects may be reduced potentially.

Learning experience is supported by both short-time and long-term simulations. Whereas short-term simulations are especially meaningful at the beginning of studies to introduce several disciplines on their own, within a more comprehensive case study, long-term simulations aiming to combine the different disciplines later in a multidisciplinary approach to prepare students for their professional life.

Conclusions

In this paper, a framework for multidisciplinary business simulation were proposed. The framework combines two basic possibilities of using the action-oriented method of simulations at the University of Kehl. On the one hand, short-term simulations can be carried out at the beginning of studies in order to be able to solve limited problems in different subject-specific disciplines. On the other hand, long-term simulations were presented, which are carried out at the end of the study shortly before starting professional work. Both simulations are based on the same comprehensive case study. Whereas short-term simulations focus on one discipline, long-term simulations combine several disciplines within the simulation process step by step. Student teams have to cope with several tasks and goals outlined using a multidisciplinary approach. It is important for students of Kehl University that the action-oriented approach is close to the real world of work. The framework combines short- and long-term simulations of several disciplines using repetition, elaboration and pattern recognition by purpose to facilitate students' learning experience and to prepare for future work.

Preparation of simulations is very time-consuming and lecturers need to have a high methodological

competence. In order to support the lecturers' work, the framework for multidisciplinary business simulations introduces a generic pattern for case studies.

Although fifteen case studies have already been developed within the framework, its implementation in the curriculum has only just begun. In addition, further research activities have to be carried out to evaluate the quality of the case studies and the usefulness of the framework. Studies on the success of simulations in academic studies are contradictory. On the one hand, successful implementations are reported (Eckhaus 2017; Ellahi et al. 2017; Merritt 2018). On the other hand, one meta-study finds no evidence of an improvement in learning success (Lamb et al. 2018). Regarding the success of study programs in the field of public administration, the long-term success perspective is important (Morton 2017). It should be evaluated to what extent the simulations within the study program have prepared students for the working world. For this purpose, surveys should be carried out within a period of 2–3 years after graduation. Although these surveys can provide some insights, no direct comparison is possible with the situation prior to the use of the framework for multidisciplinary business simulations.

However, this only applies to the perspective of the students. For more than twenty years now, the University of Kehl has been conducting surveys among employers to determine whether the graduates meet the needs of the labour market. The year-by-year comparison of these surveys may reveal changes in the future. However, employer satisfaction can be influenced by many factors. Hence, improvements may not be directly related to the framework. One task will be to adapt the survey of employers in such a way that the influence of the framework can be questioned as specifically as possible.

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DEVELOPMENT OF ELECTRONIC PAYMENTS IN GEORGIA

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Abstract. Electronic payments are considered to be a fast and secure alternative for traditional payment methods. Today, it is impossible to imagine modern bank operations, commercial transactions and other payments without electronic payments. This article shows that electronic payments are not the only means for reducing costs with respect to other payment methods, such as cash, but can also generate significant benefits for increasing economic development and reducing shadow economy. The paper focuses on the development of electronic payments in Georgia and its impact on the economy of the country. Over the decades, the payment systems in Georgia have evolved significantly in line with the technological advancement. Significant progress has been achieved in improving the e-payment systems infrastructure. The evolution of e-payments in Georgia can be characterized by the following: debit (including prepaid) and credit cards, credit and debit transfers compose a core set of noncash payment types commonly used today by consumers and businesses. These core noncash payment types are used both in traditional ways, such as in-person purchases, payroll deposits, and bill payments, and in innovative ways, such as contactless and mobile payments, e-commerce and online bill payments. Using the economic-mathematical analyses of the information taken from the web-page of the National Bank of Georgia and commercial banks' publications, a mathematical model was built, based on which the positive relationship between e-payments and economic growth in terms of real GDP was shown.

Keywords: Payment systems; Electronic Payment Instruments, Payment Cards, Correlation-Regression analyses.

JEL Classification: C02

Introduction

Payment for goods and services has been a part of human history for the civilization of humanity. Over the centuries, the types of payment methods were changing. With the development of technology, money was actively replaced by its electronic alternatives, making it possible to conduct financial transactions at any time and place. Electronic payments are defined as transfer of cash from one account to another electronically without banknotes or coins. For example, the payment of utility payments via internet, credit transfer or direct debit, payment cards payments and so on. No one knows exactly when the first electronic payment was made, but 1870 is the date when Western Union introduced the revolutionary method of electronic money transfers. It is considered as the date of the creation of the first electronic system. Then, in 1918, the American Federal Reserve Bank transferred funds through telegraph (https://www.finder.com/history-of-money). This is when the first credit report and the payment cards appeared. In 1950, the Diners Club became the first independent credit organization, followed by American Express in 1958, which issued plastic cards (https://www.creditcards.com/credit-card-news/history-of-credit-cards.php).

Today, along the significant achievements in telecommunication, electronic systems quickly replacing the traditional means of payment. Non-cash payment is an important source of economic development and has a great influence on consumer expenditures (Zandi M., at al., 2016, The Impact of Electronic Payments on Economic Growth). The growth of e-payments reduces its cost and improves the flow of goods, increases customer confidence and access to credit products. It's a safe and effective alternative to cash and helps to financial engagement. Electronic payments are transparent and reduce the number of unregistered transactions (Slozko, O., Pelo, A., 2014, The Electronic Payments as a Major Factor for

Further Economic Development, Economics and Sociology, Vol. 7, No 3, pp. 130–140). Therefore, it increases tax revenues and reduces the share of shadow economy. Based on all the facts mentioned above, the development of electronic payments systems will lead to a virtuosic economic growth: consumption increases, goods reduces and demand rises accordingly. As a result, jobs are increasing, there is more production and prosperity is growing (Zandi M., at al., 2016, The Impact of Electronic Payments on Economic Growth).

The aim of this work is to analyse the role of electronic payments in Georgia on the development of the country's economy. Specifically, the author tries to connect the electronic payments with GDP, which is the sum of the final values of product and service within the country for a certain period of time and its real growth rate is one of the major indicators of the country's economy. The share of the national consumer spending – personal consumption expenditures in Georgian GDP is 71% (http://www.geostat.ge/index.php?action=0&lang=eng). There are many researchers conducted by international organizations and authors about electronic payments' positive effect on consumption and on the real GDP in developed and developing countries, respectively. Therefore, it was the greatest interest to show how this impact was in Georgia.

This research is directed to estimate the macro-economic effects of electronic payments in Georgia. As a research method, the system approach, economic-mathematical methods and models, methodology of general statistics theory, mathematical statistics, and econometrics was used. Economic-mathematical modelling, which is an integral part of any research in the field of economics, is a process of expressing economic processes by mathematical models.

The practical task of this research, on one hand, was to analyse the economic objects of the Georgian Economy for the period 2011–2017, such as: Gross Domestic Product (in local currency - Gel), Commercial Bank Clients' transactions, which related to payments for goods and services (hereinafter referred to as 'individual payments'), Commercial Banks Client low value interbank transactions (hereinafter referred to as 'low payments') and payments by the payment cards at merchant outlets. On the other hand, the main goal was economic foreseeing for the development of the ongoing processes and recommendations on the level of the model built. The main hypotheses of the paper were developed: the increase of electronic payments is directly linked and contributes to the development of the Georgian economy.

Literature Review

We can consider the development of cashless payments as a result of a new idea to simplify the way of payments, which was then slowly adopted in peoples' life. Nowadays, the payments business is a crucial source of revenue and data and a critical anchor for broader customer relationships (World Payment Report 2017). The payment industry continues to develop and offer new initiatives to their customers. The World Payment Report 2017 highlights the key findings of global non-cash transactions during the past decade. This is the leading source for data, trends of e-payments and main industry and regulatory initiatives. According to this source, the global non-cash payments can be characterized as a fast growing market, especially in the emerging markets: emerging Asia, with a growth rate of 43.4% and Central Europe, Middle East and Africa (CEMEA), with a growth of 16.4% (2014–15 data). While the total non-cash transaction volumes grew 11.2% during 2014–2015 and reached 433.1 billion, the rate of growth in Europe changed from 7.3% to 7.5%. Noticeable growth was shown in the following countries: Germany, Spain, Finland, Ireland, Sweden and Denmark. It should be noted that China is on the third position with 38.1 billion transactions (63.2% growth rate).

Electronic transaction technology associated positively to real economic aggregates. This is more obvious for the Euro economy countries. The findings of the European Central Bank Working paper 'Retail Payments and the Real Economy' (August 2013) provided deep analyses of 27 European Member States over the period 1995–2009 and proved 7 main hypotheses, among which, the following may be mentioned: Efficient non-cash retail payment instruments stimulate economic development; Cheque payments exert a lower contribution on GDP, consumption and trade in comparison to other

non-cash payment instruments; The positive effect of credit transfers on real economic development is higher in the euro area countries than in the non-euro area countries; The adoption of new payment technologies results in additional economic development.

The different means of non-cash payments are growing around the world. Innovations are more comfortable to use for young people. For example, emerging Asian markets are driving to accelerate e-commerce development. Despite this, 'E-Payments in Emerging Markets' (Amrish Rau, 2013) states that many rural areas still do not have banking systems, while those that do are slowly moving from cash to electronic payments. The author highlights the role of government in the investment in new technologies, managing e-instrument security, developing financial inclusion and leveraging existing market players. What will be the next steps: it's clear that the future is bright and that opportunities abound with carefully planned strategies and reliable partners (Amrish Rau [2013], E-Payments in Emerging Markets, A First Data White Paper, Journal of Payments Strategy and Systems, Volume 7, Number 4).

The specific area of e-payments is electronic commerce, which created new opportunities for sending and receiving of payment instructions. The paper E-payments in Europe – The Euro system's Perspective (16 September, 2002) investigates the new methods and techniques, which developed to adopt traditional payment instruments for use in internet: credit cards, credit transfers and debit instruments. The development of e-commerce helped to raise a new type of payment service providers and develop new types of electronic instruments such as prepaid cards, electronic wallets and others together with the security issues of those instruments. The main conclusion is that the Euro system endeavours, in co-operation with standardization bodies and market participants, to help strike the right balance between competing and commonly agreed standards.

Another in depth survey on the development of electronic money and internet and mobile payments was published by the Bank of International Settlement updated Survey, which included the information collected from 95 countries around the world. The focus of this survey was not technical purposes, but the market impact of innovations. Based on the information and data provided by the Survey respondents from individual country, comparative tables on the use of innovative products and system were designed. In the survey, the data was collected in end-2002 or 2003, and covered schemes that were being considered, piloted or implemented (Survey of developments in electronic money and internet and mobile payments [March 2004], Bank for International Settlements).

The adoption of the new means of cashless payments has a significant effect on the economy. This was proved by the study Cashless payment and economic growth (Hock-Han Tee & Hway-Boon Ong. [2016], Cashless Payment and Economic Growth). Specifically, the impact of cards, telegraphic transfers, electronic money and cheques on the economies of Australia, Belgium, France, Germany and Portugal for the period of 2000–2012. Research was conducted by the use Pedroni residual cointegration and Panel Vector Error Correction Model. The main message stated from this study is that the adoption of one type of cashless payment will affect another type of cashless payment in the short run, the consequences of adopting cashless payment on economic growth can only be significantly observed in the long run. Hence, any policy that promotes cashless payment will not affect the economy immediately.

Payment card is the most popular non-cash payment instrument in the world. It allows consumer to access his finds in the bank. Greater card usage in the world gives rise to the main question: what kind of benefits it brings to the economy. The answer on this question could be found in Moody's Analytics, which offers unique tools and best practices for measuring and managing risk through expertise and experience in credit analysis, economic research, and financial risk management. Moody analytics conducted two different researches on the influence of payment card transactions on the economy with the initiative of Visa International. In the first research conducted in 2013, the data of 56 countries was studied for the period of 2008–2012 and was stated that the use of credit and debit cards added 983 billion US dollar to the GDP of these 56 Countries. Similar study was conducted in 2016 for the data of 70 countries for card transactions in the period of 2011–2015. According to this research, payment cards usage added 296 billion US dollars to GDP, which means 2.6 million new jobs on average in each year. The main message was stated 'Card usage makes the economy more efficient, yielding a meaningful

boost to economic growth, year after year, through a multitude of factors including transaction efficiencies, consumer access to credit and consumer confidence in the payment system overall' (Mark Zandi, et al . [February, 2016], The Impact of Electronic Payments on Economic Growth).

The effect of Debit and credit card transactions together with cheque transactions on GDP was also calculated by John W. Galbraith and Greg Tkacz in 'Statistics Paper Series' (August 2015) of European Central Bank 'Nowcasting GDP with electronic payments data'. The authors have divided the data received from Canadian Payment association and Bankers' Association for the investigation in two spans: the first, through the end of 2009. Credit card data were available to them from 2010. The longer data set which extends through April 2012 contained debit and cheque data. In this particular model, with debit card transaction included, some improvement in the accuracy of the earliest nowcasts was found. The results of the research give a big picture of the improvement in newscasting over time.

'The Analysis of the Factors Influencing on Electronic Payments and Relationship among Azerbaijan's Economy with Them' (2016) gives the broad analyses of factors that have negative influence on the development of cashless payments on Azerbaijan economy. Increase of electronic payments will decrease the size of shadow economy in Azerbaijan correspondingly. Moreover, illegal and low income level, low pension and high consumption, unorganized business, infrastructural possibilities and technological level, payment culture and financial literacy, gaps in legislation and other such factors that impact negatively on the development of cashless payments are analysed and the recommendations have been given in this study. In addition to these, international experience has been investigated in terms of administrative and stimulating policies in order to improve cashless payments and recommendations have been made in this direction for Azerbaijan.

A significant positive relationship between e-payment system and economic growth in term of real GDP per capita and trade per capita was found in the 'Review of Transition to Cashless Economy in Nigeria' by the authors Oginni Simon Oyewole, El-Maude, Jibreel Gambo, Mohammed Abba and Michael Ezekiel Onuh. The main finding is that most of the non-cash payments are provided through bank accounts. With this research, it was shown that only ATM operations was revealed on economic growth.

Methodology

As research tools, the system approach, economic and mathematical methods and models, the methodology of the general theory of statistics, mathematical statistics, and econometrics were used in this research.

Economic-mathematical modelling, which is an integral part of any research in the field of economics, is a process of expressing economic activities by mathematical models. Like any simulation, it is based on the principle of analogy, that is, the possibility of studying the object not directly, but through considering another, similar to it and more accessible object – its model.

The purpose of mathematical modelling of economic systems is the effective solution of problems arising in the field of economics. Designing modern information models of various economic objects allows to study their dynamics, the nature of the influence of various factors on the object being studied, as well as to predict the future conditions of the studied object/activities; it gives an opportunity to get a clear idea about the object under study, to characterize and quantitatively describe its internal structure and external relations.

The practical task of this study was, firstly, the analysis of economic objects; secondly, forecast of economic processes; thirdly, the development of conclusions and recommendations at the level of the constructed model. However, the results obtained can be used as 'consulting' means due to the extreme complexity of economic processes.

In order to identify the main tendency of factors affecting the change in the level of GDP (Gel), the factors that have the most significant influence on the effective indicator were selected by measuring the degree of connection between them; after the correlation-regression analysis provided the most significant factors, three factors were selected. These were: 'individual payments', 'low payments' and 'card payments'. What are these factors?

The main electronic payment system in Georgia is the Real Time Gross Settlement System (RTGS), through which the interbank transactions are processed. It plays a key role in terms of high as well as low value payments. For the research purposes, only payments for goods and services were chosen from the whole transactions through 2011–2017. Under the 'individual payments', commercial banks' customers transactions processed by RTGS system were considered. 'Low payments' also related to customer payments. However, they have a low value and were processed in a separate module of RTGS system for bulk transactions. It should be noted that the examined indicators may not be fully reflected in total e-payments as the source of information were the majority (not all of them) of commercial banks – system participants and the National Bank's web-site, that contains only aggregate data. As regards the third value used in the research – payment card payments for goods and services – this data is really accurate as the source is the web-site of the National Bank of Georgia. All kinds of card payment transactions (except prepaid cards with e-money functions) on the territory of Georgia through EFTPOS were included in the research.

The chart below (Fig. 1) shows the value of the data used for the research purposes (total payments for goods and services) for selected period and the total value of commercial banks' customer payments plus payment card transactions throughout the Country. The last line represents the dynamics of Georgian GDP during 2011–2017:

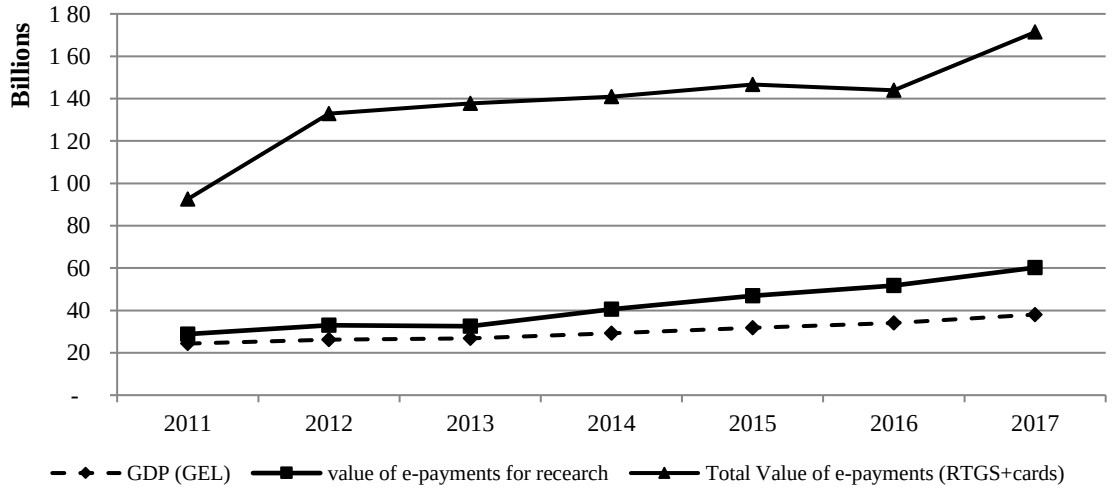

Fig. 1 The dynamics of interbank transactions and card payments in Georgia (Source: The National Bank of Georgia, Department of Statistics and the commercial banks' web-sites)

By the use of the above mentioned factors, the multiply regression model was constructed with one dependent variable – GDP, and three independent variables – individual payments, low payments and card payments. The following equation: $y = a + bx_1 + cx_2 + dx_3$ expresses this relationship. Y is the effective indicator – GDP, x_1, x_2, x_3 – individual payments, low payments and card payments at merchant outlets through POS terminals. a, b, c, d – unknown parameters.

Results

Georgia is a small county with growing economy. The table below (table 1) shows the 2017 economic indicators 2017 (World Bank Georgia: http://www.worldbank.org/en/country/georgia/overview)

Table 1. Georgia Economic Indicators 2017

Population, Million	3,70
GDP, current US Dollars, billion	14,30
GDP per capita, current US Dollars	3,864
GDP real growth, percent	5
Inflation % (annual), March 2018	2,8

An important step in the development of electronic payments in Georgia was taken in September 2001, when the first interbank real-time payment system (RTGS) was introduced with the help of international financial organizations. This led to the creation of an electronic exchange of information between commercial banks. The figure below (Fig.2) shows the dynamics of RTGS transactions value per capita:

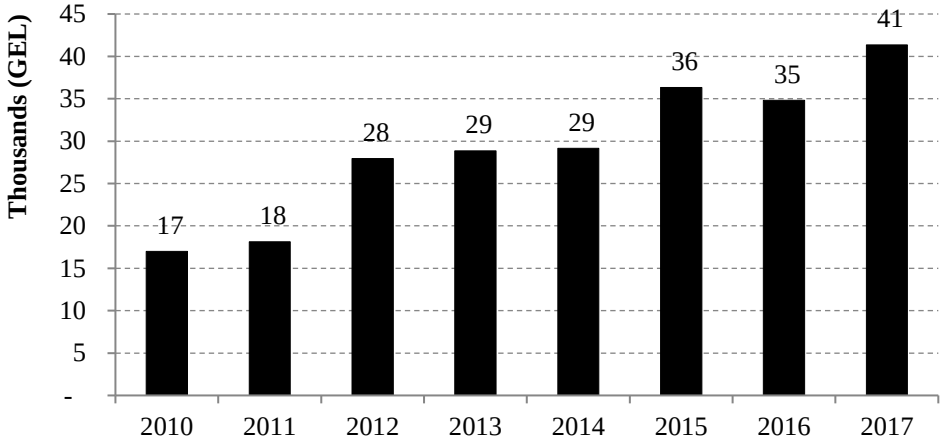

Fig. 2. RTGS transactions per Capita (Source: NBG)

While the Interbank Settlement System creates a robust infrastructure for credit transfers, the card payment networks provide an important infrastructure for card payments. The first few steps of the Georgian Payment Card market establishment were taken from the end of the 90s of the last century (www.nbg.gov.ge). The first local and international cards were issued by the commercial banks (Local in 1996; Visa in 1998; MasterCard in 1999); also, the first POS and ATM networks appeared at this period. However, the rapid development of the payment card market started a bit later – from 2004, which was mostly expressed in the significant growth of the issued payment card number and card accepting devices' network, and in the development of card infrastructure within the whole country. During the last period, card transactions turnover increased significantly, both in terms of volume and value. Figure 3 shows the dynamics of card transactions volume (%) in Georgia.

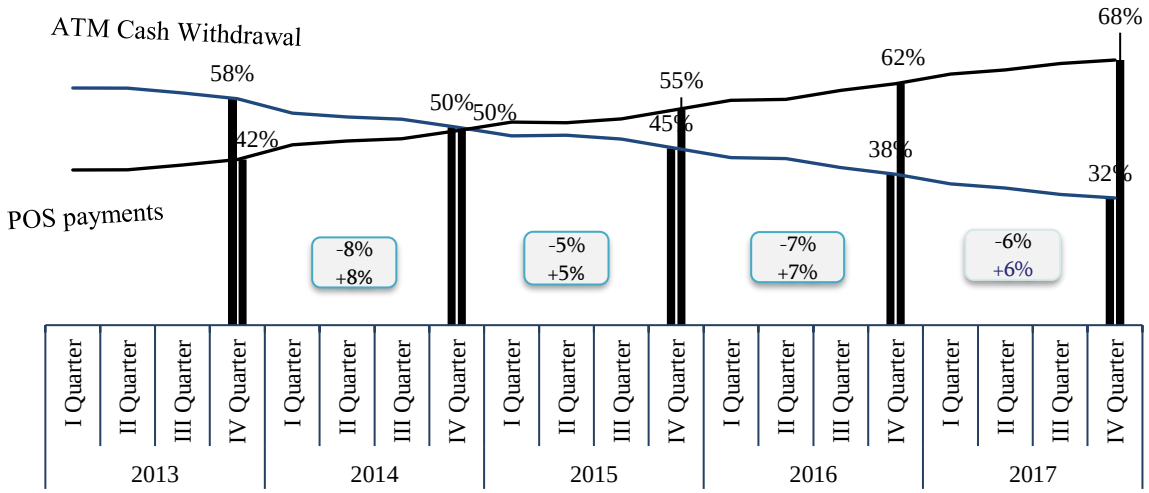

Fig. 3. Number of Card payments in Georgia (Source: NBG)

It should be noted that the payment card market in Georgia is characterized by high rate of innovative products, which is supported by the National Bank at the regulatory point of view. Chip card technologies are well developed. Gradually, it has introduced the technology of contactless cards, which are used in public transport, merchant outlets, school cafeterias and so on. Mobile POS (mPOS) was introduced by the commercial banks specifically for small business companies, which allow them to accept payment electronically, without cash. Contactless card in the accessory – payment watch appeared as a new innovative product. For the acceleration of electronic payments, the following initiatives has been taken by the policy makers (www.nbg.gov.ge):

✓ All social benefits are paid through banking channels, especially by payment cards.

✓ It became mandatory for state organizations to pay salaries to their employees using personal bank accounts. Again, banks offered payment cards to such customers.

✓ Commercial banks issued special cards for schoolchildren with limited functions, which can be used at specific food outlets (school buffet).

Along with the traditional payment instruments, the distance banking services were developed, which allow users to perform various banking transactions using electronic channels:

✓ Internet Banking, when the user has access to his bank account, and can perform various banking operations using a computer connected to the Internet

✓ Telephone-Banking – services through telephone voice communication

✓ Mobile Banking, enabling mobile phone users to manage and control their bank accounts and provide payment transactions

✓ SMS-Banking

✓ E-Commerce – enabling to buy through internet

✓ Electronic Money – offer customers to make payments through the internet within their electronic money account in order to buy services and products or transfer money to another customer's electronic money account.

✓ Self-Payment Kiosks network is growing rapidly in Georgian payment market. It allows customers to make different types of payments in a convenient and operative way.

The general Electronic Payment systems' infrastructure in Georgia is shown below (Fig.4)

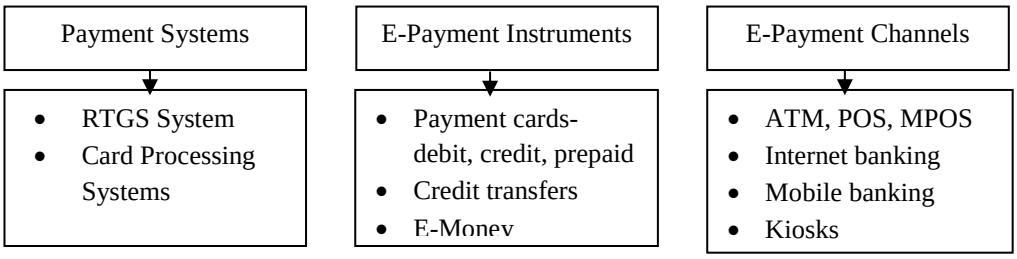

Fig. 4 General Infrastructure of Georgian E-Payment System (Source: NBG)

If we look at the statistics of electronic payments in Georgia, we can see that card payments (number of transactions) at merchant outlets have been stably growing during the past four years. In terms of value, the internet-banking transactions are the largest in total non-cash payments. The figures 5 and 6 show the distribution of non-cash payments by means of initiation during 2017.

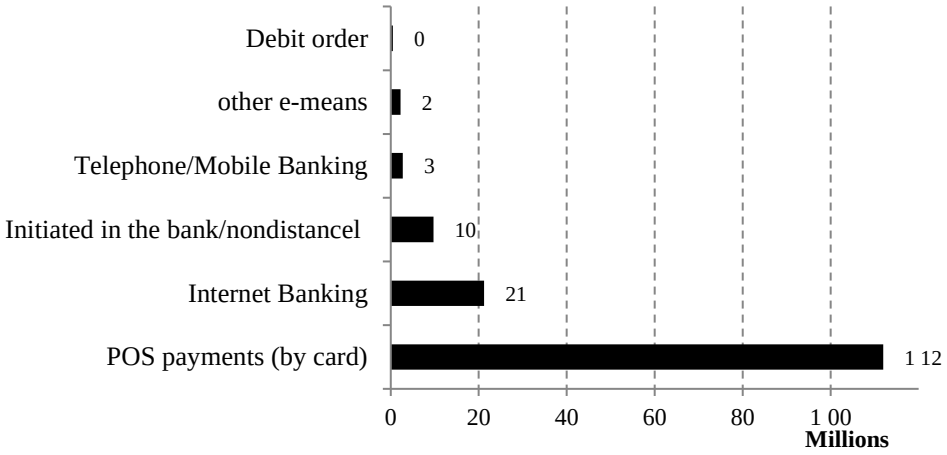

Fig. 5. The distribution of e-payments by means of initiation (volume) (Source: NBG)

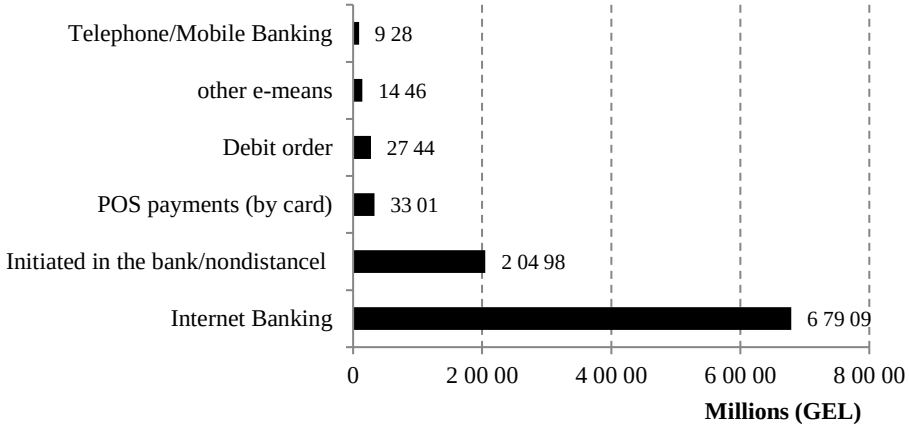

Fig. 6. The distribution of e-payments by means of initiation (value) (Source: NBG)

The brief discussion above demonstrates the positive trend of the development of electronic payments in Georgia. This was also confirmed by the correlation-regression analysis, which was conducted on the mathematical model described above. According to the calculations provided, the following results were adopted:

- An increase of Individual payments by one unit from it average level leads an increase of GDP by 0.25 unit from its average level.
- An increase of low value transactions by one unit from its average level leads an increase of GDP (Gel) by 1.08 from its average level.
- An increase of card operations by 1 unit from its average level leads an increase in GDP (Gel) by 0.34 units from its average level.

The tightness of the connection is quantitatively expressed by correlation coefficients. Coefficients of correlation, representing a quantitative characteristic of the tightness between the factors, make it possible to determine the usefulness of this factors in the construction of multiple regression equation. The size of the correlation coefficients also serves as an estimation of the correspondence of the regression equation to the revealed cause-effect relationships (Robert S. Pindyck and Daniel L. Rubinfeld).

Coefficient of uncorrected multiple determination $R^2 = 0.94$ estimates the proportion of variation in the result due to the factors presented in the equation in the overall variation of the results. This indicates a very close relationship of factors of the result.

The coefficient of adjusted multiple determination $R^2 = 0.9001$ determines the tightness of the connection, taking into account the degrees of freedom of the general and residual variance. It gives such a kind of estimation of the tightness of the connection that does not depend on the number of factors in the model, and therefore, it can be compared on different models with different number of factors. Both coefficients indicate a very high determinacy of the result Y in the model by the factors of Individual payments, low value payments and card operations (X_1, X_2, X_3).

Analysing the constructed model of multiple regressions, it was also found out that:

- One percent increase of individual transactions number from its average level leads an increase of GDP by 0.2% from its average level.
- One percent increase of low payments from its average level will increase GDP by 0.09% from its average level.
- One percent increase of card operations from its average level leads an increase in GDP by 0.01% from its average level.

Tables below (Tables 2, 3 and 4) highlight the results of analyses provided:

Table 2. Regression Statistics

Regression Statistics	
Multiply R	0.970140635
R-square	0.941172851
Normalized R-squared	0.933499745
Standard Error	317222845.1
Observation	27

Table 3. Dispersion Analysis

	df	*SS*	*MS*	*F*	*F Value*
Regression	3	3.70295E+19	1,23432E+19	122.6586477	2.72E-14
Remainder	23	2.3145E+18	1.0063E+17		
Result	26	3.9344E+19			

Table 4. Results of Analysis

	Coefficients	*Standard Error*	*t-statistics*	*P-Value*	*bottom 95%*	*top 95%*
Y-	3001119266	395159986.3	7.594694226	1.03428E-07	2183668558	3818569974
X1	0.258226178	0.104649177	2.467541407	0.02147417	0.041742862	0.474709493
X2	1.084429729	0.352461818	3.076729661	0.005333423	0.355306911	1.813552546
X3	0.3458727	0.842861532	0.410355304	0.685342887	-1.397719213	2.089464613

Conclusions

The presented analysis was an attempt to understand how the existing cashless transactions effect the Georgian economy. With the help of mathematical model built, it was found that the use of non-cash payments is closely related to the level of economic development. These results were relatively noticeable for interbank transactions (individual payments and low payments) and less for card payments. However, it should be noted that the value of interbank payments is relatively stable during the recent years, but card payments are still in the developmental stage and its value is growing year by year. That's, why the development of payment cards is a big potential for the country's economy. Consequently, the increase of initiatives and investments in the strengthening of card market infrastructure across the County will contribute to the development of electronic payments and increases the level of economy. Most people still rely on cash. Changing their habits and believing in cashless payments is not easy and its performance is a longer term plan. But today, we have a clear picture that e-payments system is going to grow and continue to develop.

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THE EFFECT OF SERVICE CLUSTERS ON THE SUSTAINABLE ECONOMIC DEVELOPMENT

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Abstract. Clusterization has been named as one of the priorities of the development strategy of many European Union countries. Clusterization experts have already hypothesized that clusters of various economic activities are important not only in the formation of regional policy, but they also in a complex way stimulate the whole country's economic growth from job creation to the development of intellectual property to new innovative industries. These realities show that cluster activity and its results are important not only for cluster participants, but also for the economy of the country in which clusters operate. However, there are currently no reliable and effective tools to validate this hypothesis. In the analysis of the problem and in order to deepen the theoretical knowledge of the object under study, this paper analyses and summarizes systematic, logical and comparative scientific literature, scientific studies, strategic documents and legal acts. Therefore, the purpose of this paper is to provide a theoretical overview of the currently available knowledge on service clusterization and sustainable economic development, to demonstrate the acute absence of relevant theoretical foundations and linkages that would allow to analyse these phenomena, and propose a methodological approach that would allow to expand this field of study.

Keywords: Clusterization, sustainable economy, development

JEL Classification: C38

Introduction

Service clusterization as a phenomenon has been developing steadily in the wake of many industries' tendencies to consolidate themselves in order to reduce proximity between companies as a means of attaining greater operating (and other) benefits. One of the more well-known examples of clusterization would be the Silicon Valley – the home and hub of the world's greatest technology companies. Service orientated organizations, those whose main operations and business practices are concerned with the production and distribution of intangible goods (as opposed to physical products) also have been striving to capitalize on the benefits of clusterization and seek to consolidate (be it geographically or virtually). Service clusterization and self-sustaining business clustering initiatives are becoming more and more prevalent. Some of these clusters are purposefully developed and aimed at achieving long-term economic goals, while others are still in the formation process and are at the embryonic stage. Clusterization has been named as one of the priorities of the development strategy of many European Union countries.

On the other hand, in today's world economy, it is not enough to evaluate purely economic indicators in order to determine the impact of clusters on the national economy. In terms of both academic studies and country's practice, the term 'sustainable economy' or its synonyms, such as 'sustainable development', 'smart economy' and so on, are used in terms of the level of development of a country. The essence of a sustainable economy lies in the assessment and development of three unambiguously important dimensions (economic, social and environmental).

The above-mentioned statements suggest that clusters and related processes are extremely relevant for the implementation of priorities for a modern sustainable economy. However, there is practically no research on the complex impact of clustering on a sustainable national economy. Many contemporary

scholars have extensively studied the process of cluster formation, their forms, their benefits to cluster participants and so on.

Research on the topic of sustainable economy has been published by both Lithuanian (Juknys, 2010, Čiegis and Zeleniūtė, 2008, Čiegis and Šimanskienė, 2010, etc.) and foreign authors (Ness, 2007, Mauerhofer, 2008). However, there were also no scientific discussions that included a sustainable economic assessment in relation to clustering. Meanwhile, clusterization experts have already hypothesized that clusters of various economic activities are important not only in the formation of regional policies, but also in a complex way stimulate the whole country's economic growth from job creation to the development of intellectual property to new innovative industries. However, there are currently no reliable and effective tools to validate this hypothesis.

Formulation of the scientific problem. Clusterization and sustainable national economy have been widely debated over the past decade in scientific circles and various economic and policy levels. Both of these phenomena are usually analysed individually, their apparent benefits and interconnectedness are presented in a fragmented way. The analysis of scientific literature revealed that the problem of identification and assessment of the impact of clusterization on a sustainable economy is not particularly emphasized. It has been observed that in the works of scientists, there is a lack of a complex and integrated approach, and a clear research methodology to address this issue. Therefore, this **scientific problem** emerges: Which research methods should be applied that would allow to determine the impact of clusterization on a sustainable country's economy?

Methodology

In order to empirically investigate the formulated scientific problem and achieve the goal of the study, the research will follow the logical progress framework that has been created and is presented in Figure 1 below.

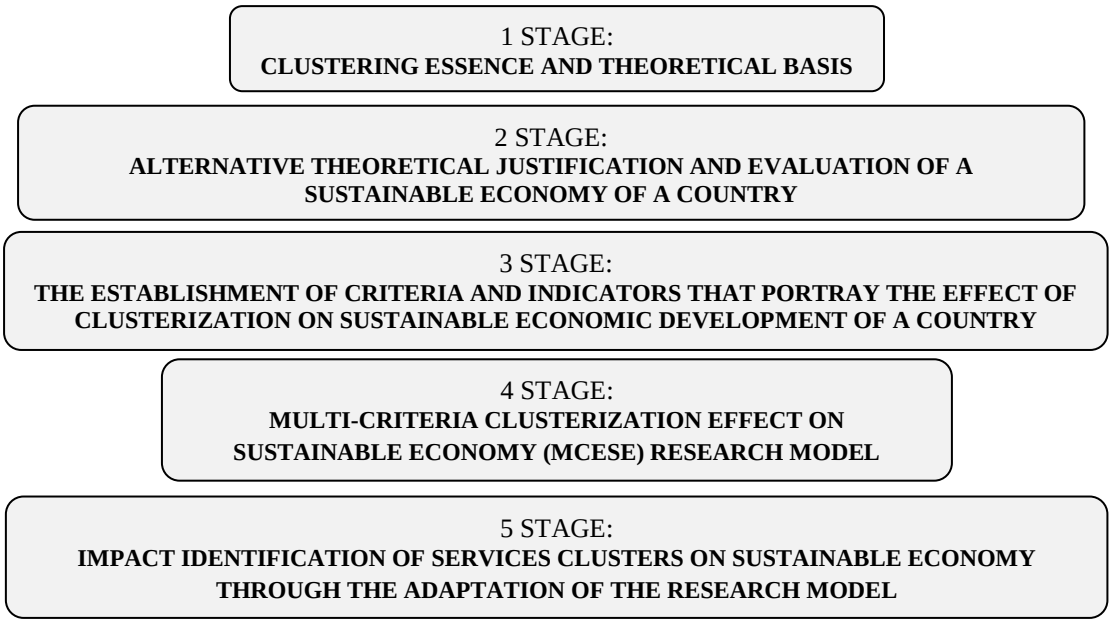

Fig. 1. Research logical frame (Source: Created by the authors)

In order to analyse the problem and to deepen the theoretical knowledge, the theoretical part carries out systematic, logical and comparative analysis of scientific literature, strategic documents and legal acts. Based on scientific literature and studies, and based on the methods of logical induction and deduction, a compact multi-criterion model of the impact of clusterization on the sustainable economy of the country is envisioned to be created that would interlink and integrate the dimensions of sustainability with service clusterization effect. Thereafter, it is necessary to empirically verify the created research methodology based on theoretical knowledge. To this end, the hypothetical MCESE model that is proposed should at least apply these research methods:

1) Systematic, logical and comparative analysis and synthesis of scientific literature and scientific studies
2) Analysis and synthesis of the content of strategic documents and legal acts
3) Analysis of primary and secondary statistical data
4) The mean comparison method
5) Expert evaluation
6) Questionnaire survey
7) Mathematical and statistical processing methods using statistical data processing programs: SPSS and Microsoft Excel
8) Calculation and evaluation of integrated indicators

Following the empirical application of the MCESE study model in practice, appropriate conclusions can be drawn and, if necessary, the hypothetical model can be adjusted.

Literature Review

Clusters and related phenomena have been studied and shaped for almost two decades. Interest in them and their benefits can be seen both in Lithuania and in Europe. According to R. Jucevičius (2009), a cluster as a form of economic activity reflects many challenges of the contemporary environment – both in developed and developing countries, such as Lithuania.

In 2014, the Government of the Republic of Lithuania (Resolution No. 298 of the Government of the Republic of Lithuania of 25 March, 2015) highlighted 2 important phenomena in this regard:

1) In order to promote business and scientific cooperation, the concept of the development of clusters in Lithuania was approved, where the objectives and tasks of cluster development have been established, the directions of development of clusterization processes were determined, the optimal number of cluster members, the level of cluster development, the mechanisms (financial instruments), which promote the creation of clusters, development, innovation activities and connection to international networks.
2) According to the state of cluster development, Lithuania from the 109th position among 144 countries in 2013 rose by 20 positions, and in 2014, it was at the 89th position (the strategic goal was set to reach the 70th place by 2020 according to the cluster development level).

The listed topicalities oblige to get acquainted with the theory of clusters in detail and to clear up the most important aspects related to the scientific problem of this research.

Global clusters and clusterization problems are discussed in various scientific sources (Bekar, Lipsey, 2001, European Commission, 2003, Frerot, 2008, Roelandt et al., 2000, etc.). R. Jucevicius (2008) states that so far, there is still no consensus agreed on regarding what should be the most precise definition of a cluster. This situation is conditioned by the fact that clusters were historically formed around the world, in different cultures, linguistic groups, various economic conditions, and thus, they acquired specific characteristics in various countries. The concept of a cluster is multifaceted and encompasses geographical distribution, type of communication, sense of dependency, technological level, life cycle and so on. It is also used for local economic development and regional analysis (employment, economic growth and productivity) (Frerot, 2008).

Most researchers in their cluster definitions particularly distinguish the geographical concentration (Porter, 2000, Silvestre, Dalcol, 2010, Pearl, 2010, Jucevicius, 2009, etc.). Other authors (Brito, Costa, 2009, Felzensztein, 2008), Jucevicius, Puidokas, 2007) identify the essential element of the cluster definition as the relationship between cluster members. Still other scientists (Montresor, Marzetti [2008], Hatani [2009], Williams, Claiborne [2009]) devoted a great deal of attention to the role of the final products and research institutions in defining clusters. The most common cluster definitions are shown in Table 1.

Table 1. 'Cluster' definitions in literature (Source: created by the authors)

No.	Year	Author	Definition
1.	2000	M. Porter	The geographical concentration of interconnected firms, specialized suppliers, service providers, related industries and associated institutions (i.e., universities, agencies, trade associations), which both compete and cooperate in a particular area.
2.	2000	TH. J. A. Roelandt, V. A. Gilsing, J. Sinderen	Strongly interconnected affiliated company (including specialized suppliers) networks based on value-generating production chains.
3.	2001	C. Bekar, R. G. Lipsey	A large regional group of geographically close proxies, whose members not only cooperate with each other, but also maintain strong links with local research and research organizations, national laboratories, financial institutions and other business infrastructure elements.
4.	2003	Commission Of The European Communities	Geographically interconnected, complementary and even competing companies, specialized suppliers, service providers and associated institutions (such as universities, standard and trade associations).
5.	2008	A. Kamarulzaman, N. Mariati	Significant geographic concentration of entities that are similarly and complementarily (at least one industrial sector, agency, institution) causing the directness of actors and their formal and informal interaction, agglomeration economies, and high social capital, that promote dissemination and all of which have a significant impact on the region or national economy.
6.	2008	Europe Innova	A common place for partners, service providers, education and research institutions with a wide range of interactions.
7.	2009	R. Jucevičius	Geographically close groups of interconnected enterprises and other organizations in a certain area, linked by common technologies and competencies
8.	2012	'Klasterių studija'	Interconnected companies, suppliers, academia, related institutions and other actors, whose participants collaborate in a wide range of economic activities and initiatives, in order to increase economic efficiency, knowledge sharing, technology transfer and the development of new products.
9.	2008	www.klasteriai.lt	Geographically close groups of companies and associated institutions merged in certain fields related to common technologies and knowledge

As can be seen from Table 1, numerous authors provide cluster definitions, but according to D. Kulikauskas and D. Viselgaitė (2012), they are usually only modifications to the definition of M. Porter (2000). Each author focuses on certain elements that describe clusters, according to the object of their research and point to it as the most important one. Therefore, it can be argued that the theory of clusters is relativistic and still being developed: in each case of a scientific study, it is possible to find different criteria that define the concept of clusters. However, in the scientific literature, the basic concept of cluster formulated by M. Porter (2000) is commonly used – the geographical concentration of interconnected enterprises, specialized suppliers, service providers, related industries and associated institutions (i.e., universities, agencies, trade associations) that both compete and cooperate in a certain area.

Summarizing the concepts from Table 1, it can be seen that clusters are related to the activity of a defined field (business), geographic concentration and complementary cooperation. Therefore, R. Jucevičius (2008) suggests understanding clusters in two possible senses:

1) In the narrow sense, a cluster is an economic agglomeration; the cluster is a combination of companies that interact with each other in related and supporting activities (i.e., specializing in a particular stage of the product value chain and benefiting from cooperation with suppliers and customers).

2) In the broad sense, a cluster is a regional/sectoral social production and innovation system; the cluster is a combination of companies that interact with each other in related and supporting activities (i.e., specializing in a particular stage of the product value chain and benefiting from cooperation with suppliers and customers).

Thus, a brief analysis of the scientific literature shows that the cluster as a phenomenon is multidimensional and ambiguous. However, it is possible to distinguish the most common features that characterize them (Stalgienė, 2010):

- Critical mass
- Businesses are concentrated in a limited area
- Companies/organizations must be close enough to avoid unnecessarily high levels of cooperation/meeting costs
- Relationships between organizations are sustained consistently, ensuring the achievement of common goals
- Mutual interaction
- Specialization
- Competition and cooperation
- Uniqueness
- Clusters can increase innovation, production competitiveness and support or promote economic growth in the region and/or the country
- Clusters are self-organizing

The scientific justification of cluster concepts and their characteristics suggests that this phenomenon can take shape both in the production (industry) and in the service sector.

According to Porter (2000), the government's economic policies that promote clustering processes can become a factor integrating different areas of economic activity that are regulated by public authorities (see Figure 2).

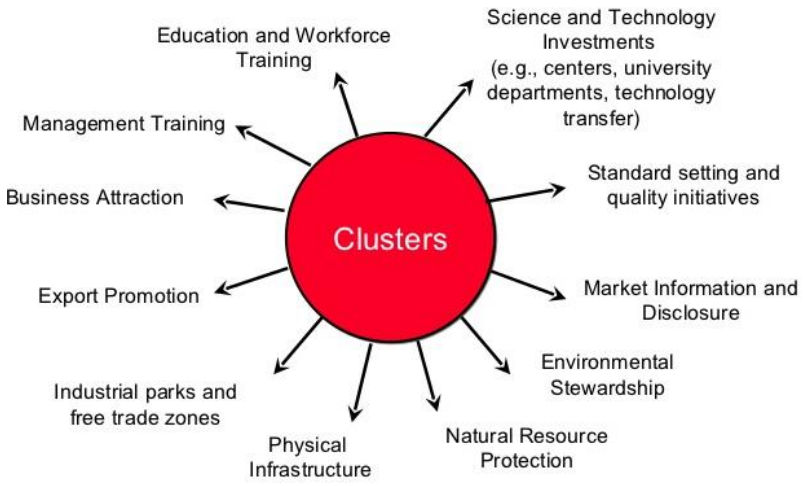

Fig. 2. Relationship between clusters and general macroeconomic policies (Source: Porter, 2000)

As Figure 2 shows, clusters are closely linked to essential directions of modern economics, especially with regard to direct investment, research and innovation. The policy of clustering as an area of autonomous economic policy began to intensify only in the last decade, but many elements of clustering are already reflected in the country's innovation and technology policies. All the countries developing clustering policies use it as a means of strengthening national competitive advantage. The policy that promotes the development of the country's (or region's) exclusive competitive properties is based precisely on cluster-based approaches. With such wide range of cluster effects, cluster development creates prerequisites for increasing productivity – one of the key sources of enterprise competitiveness.

V. Navickas and A. Malakauskaitė (2008) argue that cluster building and formation is becoming a significant task for governments and companies, while clustering initiatives outline new guidelines for economic policies that are based on macroeconomic stabilization, privatization and market liberalization in advanced economies. In many countries, modern economic and industrial policies are based on the cluster concept. In implementing such a policy, the state develops and implements measures to promote the interconnection of enterprises belonging to the cluster and the development of the strategic communication cluster in the external environment. Similarly, Skarzauskiene, Gudelytė and Lančinskienė (2014) state that in the context of a globalized economy to stimulate the emergence of innovation and their implementation in the country, clusterization and clustering of individual sector provide additional opportunities for promoting competitiveness, innovation development and stimulation of economic growth.

Many authors evaluate the process of clustering and its benefits positively, distinguishing one or the other aspects of their creation or performance. Most commonly, the following aspects of the purpose behind clustering are distinguished (Jucevičius et al., 2012):

- Encourages the country's economic growth and labour force employment
- Attracts new technologies, skilled workers and investment in research
- Commercialize innovation
- Increases economies of scale
- Helps to reduce the length of new products or processes entering the market
- In general, cluster companies have more opportunities to increase productivity
- Help to increase the competitiveness of the whole sector (not just individual enterprise)
- In addition to the perception of overprinting, more attractive conditions for innovations are created

<u>Alternatives for assessing sustainability of a national economy in scientific discussions.</u>

Historically, the industrial development of the world was primarily aimed at production, but from a societal point of view, the paradigm of development was directed at the growth of justice, where social factors were important, and then environmental protection was taken into consideration, which became the third most important development goal. Consequently, the development of the concept of sustainability has three main points: economic, social and environmental. Therefore, the concept of 'sustainable development' was ushered, which means that sustainable development must ensure not only economic growth but also the compatibility of economic activity with environmental, social and technical constraints. Many authors emphasize that it is not possible to achieve the desired level of economic, ecological or social sustainability at the same time without at least ensuring the minimum level of sustainability in each of these sustainability forms.

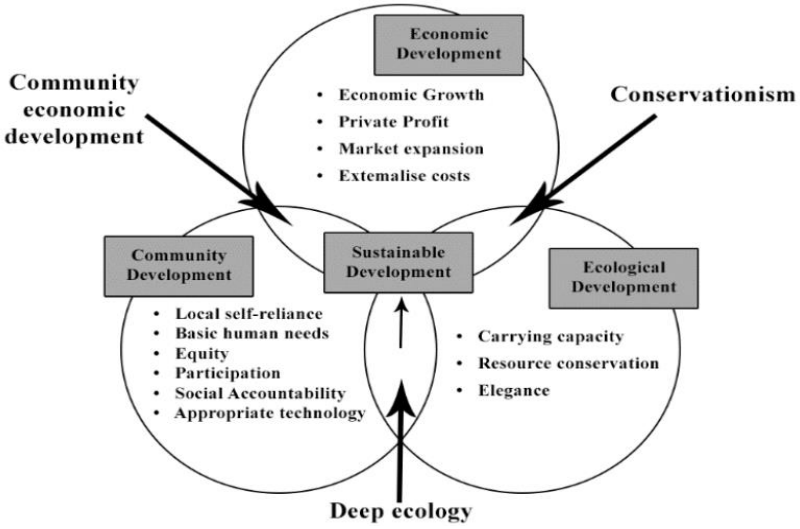

Fig. 3. The traditional perception of sustainability dimensions (Source: Mieszajkina, 2016)

Figure 3 represents the most often presented reflection of sustainable development concept and its dimensions in the work of many researchers. However, more recent studies reveal some new trends. Sustainable development, in the works of some authors (Čiegis et al., 2005, Mauerhofer, 2008), is to be considered as a derivative that has more than three dimensions, and the four dimensions are economic, social, ecological and institutional. This broader perception of sustainability is presented in the Mauerhofer (2008) analysis. He suggests using the 3D Sustainability Model to measure performance. By introducing an institutional dimension, it more reflects the idea of sustainability (see Figure 4).

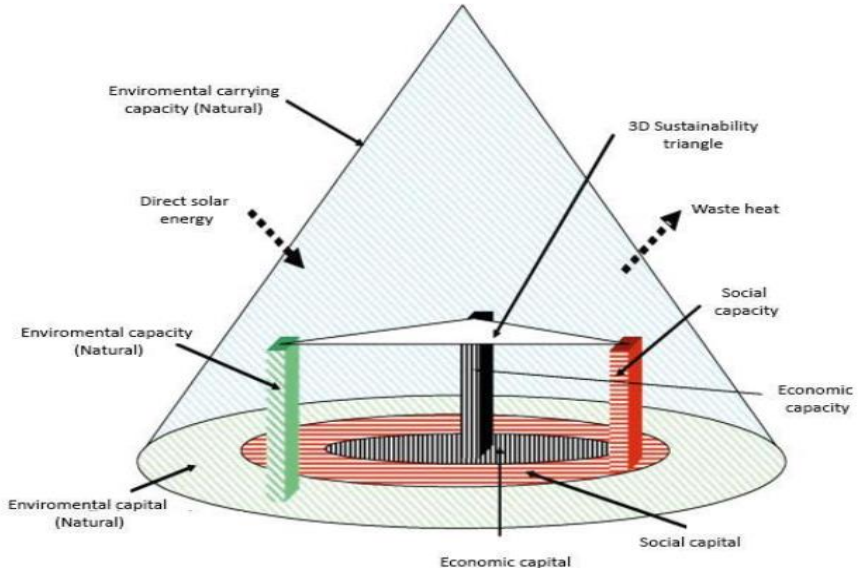

Fig. 4. Sustainable development in 3D model (Source: Mauerhofer, 2008)

According to this model (see Fig. 4), the economic aspect is integrated into the social (public) aspect, and both of them – into the environmental aspect. The model is limited by a cone symbolizing environmental constraints. The economic aspect at the middle of the circle indicates that it is created from human labour and environmental resources. Columns symbolize social (population, lifestyle, education, as well as institutional factors [political and governance system], property rights, etc.), environmental (ability to provide resources, space and other services) and economy (profit, productivity, unemployment level) capacity.

Yuknys (2012) presents another interesting 4-dimensional understanding of a sustainable economy. Yuknys has argued that the processes of quantitative growth inevitably prevail in the lower stages of development, but the gradual increase in the contribution of qualitative changes is evolving. The more we approach the boundaries of the Earth or some territorial unit, the slower is the quantitative growth and the greater is the contribution of qualitative changes to the overall development process. Under this notion, upon reaching Earth's capacity limit, further development, in keeping with the principles of sustainable development, should be based solely on qualitative changes (development) and a phase of zero growth should start there.

However, Mikalauskienė (2014) states that it is not really possible to compare all four types of capital (human, developed, natural and social). The sustainability criterion foresees that the same indicators should be applied when defining the coherence of all four dimensions. Unfortunately, there is no single indicator that is suitable for social cohesion, human satisfaction and ecosystem integrity. These criteria, just as monetary value, must be monitored and measured in their own dimensions. To this extent, the economic theory with its need for strong and reliable comparability measures makes it challenging to contemplate how ecological and social processes are economically important. Therefore, the conception of a sustainable economy of the 4 dimensions remains outside the bounds of economic theory that is concerned with strong comparability or at least a high degree of comparability measures.

Based on the above conclusion, this work assumes that the basis of a sustainable economy of a country consists of three dimensions: economic, social and environmental.

Analysing scientific literature and strategic documents, it was observed that many authors (Juknys, 2010, Ciegis and Zeleniūtė, 2008, Čiegis and Šimanskienė, 2010) emphasize the territory (city and/or state) when talking about sustainable development. Griesienė (2013) emphasizes that the development of the theory of sustainable development is important for the analysis of the states, since this area is paying great attention not only nationally but also globally, thus solving problems prevailing worldwide. It is therefore important for countries to develop national strategies for sustainable development that contribute to the implementation of the concept at the country level and contribute to addressing the global challenges of environmental protection, consumption and resource depletion. Main goals of Lithuania's sustainable development:

- in terms of economic and social development, resource efficiency indicators by the year 2020 to achieve the average EU Member States in 2003

- on the basis of environmental indicators – to comply with the EU's permissible standards, to comply with international conventions that limit environmental pollution and impact on the global climate. All indicators in the Lithuanian sustainable development strategy are presented in Figure 5.

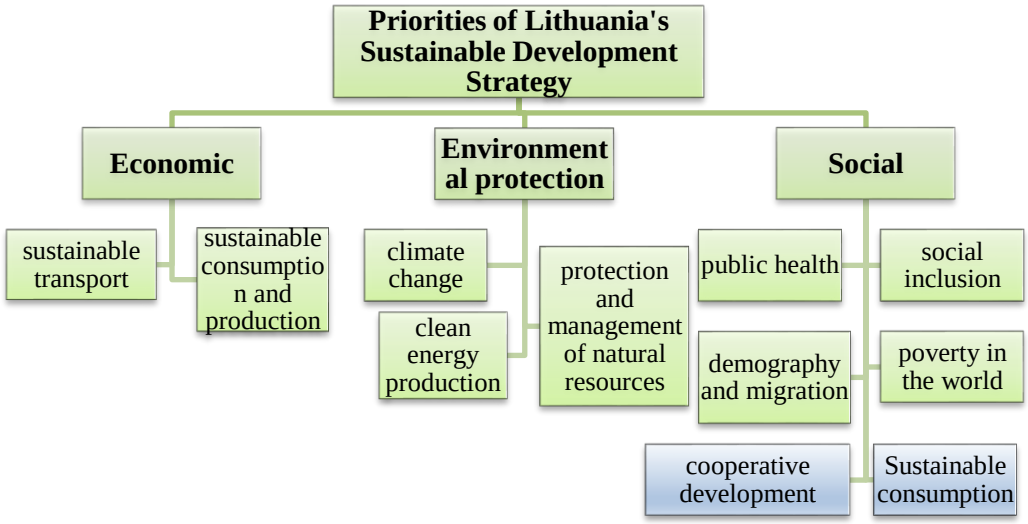

Fig. 5. Priorities of Lithuania's Sustainable Development Strategy (Source: prepared by the author based on the National Strategy for Sustainable Development, 2018)

Lithuania's strategic priorities for sustainable development (see Chart 5) are set in accordance with the national interests of Lithuania, peculiarities, priorities of the EU Sustainable Development Strategy, provisions of other program documents. This strategy includes six sectors of the economy, four environmental sectors, four key social aspects and regional development issues. All these economic, social, environmental and regional development aspects must be presented and formulated through their integration.

The need to follow and analyse strategic documents is justified by the fact that it would not be possible to determine the impact of clusterization on sustainable national economy without knowing what priorities were set and what goals the country was seeking.

Having identified the concept of a sustainable country's economy and its relationship with the country's strategy papers, it is necessary to review its alternatives. Cough and Kozlovskiy (2011) state that in recent years, the development of an effective system for the progression of sustainable development has focused not only on sustainable development theorists, but also on the various national and international institutions responsible for the practical implementation of the ideas of sustainable development.

Ness (2007) argues that the methods for assessing sustainable development can be divided into the following categories:

- **Indices**, which are further broken down into both integrated and non-integrated ones
- **Product-related assessment** that emphasizes product and/or service materials and/or energy flows in terms of life-cycle
- **Integrated assessment methods**, the set of which is intended for strategic change or implementation of projects

Analysing scientific literature, it has been observed that scientists or responsible institutions have derived a number of integrated indicators and indices, most often used in Table 2.

Table 2. The most commonly used integrated sustainability assessment indicators (Source: prepared by authorbased on Čiegi, Kozlovskij, 2011)

Indicator name	Short name	The essence of the indicator
Index of Sustainable Economic Welfare	**ISEW**	It, like GDP, shows only the activity of economic activity over a certain period of time. And while the estimates include income distribution indicators that help internal consistency, these economic indicators do not say anything about sustainable economic development over time. This indicator completely eliminates the social indicator.
Genuine progress indicator	**GPI**	GPI is an advanced tool for ISEW, because it combines more indicators (both economic and environmental). Thus, it better reflects economic well-being and ecological sustainability. On the other hand, this index does not touch on social components, although one of the most important features of sustainable development is the harmonization of all three aspects of human life (economic, social and ecological). Hence, GPI as a tool for assessing sustainable development is not completely satisfactory.
Welfare index	**WI**	The welfare index is integrated. On the other hand, the economic and social components of sustainable development are considered together in this case (HWI sub-index), while the ecological component is separate (EWI sub-index). In addition, since both sub-indices have the same weight (Welfare index is the arithmetic mean of HWI and EWI), it eventually results in the environment being considered to be twice as important as the economic or social. The welfare index also analyses social sustainability. The internal social sustainability in this case is strongly portrayed – more than 10 social indicators are used for this purpose.
Human Development Index	**HDI**	The HDI consists of an equivalent sum of three components: (a) Lifecycle index (b) Education index consisting of 2/3 literacy index + 1/3 higher education index (c) Generic product index Such HDI calculation has received much criticism. Most of this critique is related to calculations, the correctness of data selection and so on.
United Nations Indicators of Sustainable Development	***UNCSD58***	Since 2001, UNCSD58 consists of four groups of sustainable development indicators: 1) Economics, which consists of subgroups of 2 indicators: economic structure (4 indicators) and consumption / production (9 indicators) 2) Society, consisting of subgroups of 6 indicators: equality (4 indicators), health (8 indicators), education (3 indicators), housing (indicator 1), security (indicator 1) and population (2 indicators) 3) Environment, consisting of subgroups of 4 indicators: atmosphere (3 indicators), land (6 indicators), oceans / seas / coasts (3 indicators) and fresh water (3 indicators) 4) Institutions, consisting of groups of 2 indicators: institutional framework (2 indicators) and institutional capacity (4 indicators) (UNCSD, 2001; 2007; Ciegis, 2010)

Table 2 contains a number of indicators for sustainable development, however, none of them are adequately sufficient on their own. On the basis of the study of scientific literature, it was concluded that to date, there is no single method or system to measure the development and change of a sustainable economy. Therefore, it is necessary to very precisely identify the object of the investigation and then to select and/or modify the most appropriate existing methods that allow the optimal results of the evaluation to be achieved.

The lack of scientific substantiation in regard to establishing criteria and indicators portraying the impact of clusterization on individual national economic sustainability dimensions

Analysis of the scientific literature and the content of strategic documents revealed that the Lithuanian cluster formation environment is highly related to the implementation of the strategic vision of Lithuania 2030, in particular, the priority area of the smart economy and the economic priority of integrating the national economy into global networks. The priorities and goals of the National Progress Program of Lithuania (2012) should strongly stimulate clusterization and integration processes. Thus, it can be stated that the environment formed at the highest strategic level is very favourable for the development of clusters, and the envisaged financing for this area allows real development of the clustering policy. However, there remains a high risk that companies are most interested in not total economic benefits and participation in the overall value chain, but state support (Clust Studio [Klasterių studija], 2012).

However, after analysing the scientific literature on clusters and the theory of sustainable national economics, it has been observed that the focus is on the development of clusterization (especially in the manufacturing [industrial] sector). However, the impact on the economy, and even more so on the sustainable development, is not substantially investigated or occurs only in isolation and lack an integrated and unified approach (the process of clusterization itself, its possibilities and disadvantages, impact on cluster participants, impact on the region, etc. are considered). Nevertheless, it is necessary to mention such a research as it is a great start for the further solution of the problem formulated in this dissertation.

The very first research project for clusters in Lithuania appeared in 2001, which was conducted by the KTU Business Strategy Institute together with the Centre for Economic Research in 2001. This research work, similar to the Lithuanian cluster software study (2003), was dedicated to clusters as an important aspect of improving the competitiveness of the national industry and business and to demonstrate to the heads of enterprises and organizations of the country, to explain to all interested parties the essence of clusters, their advantages, showing the experience of other countries to promote clustering of enterprises. It can be argued that these studies were more descriptive than evaluative and only justified the existence of the clusters themselves and their application in practice.

Another research work was carried out in 2007 – the Feasibility Study of the 'Kurortology' Research Cluster in Druskininkai (State Tourism Development Institute). However, it was intended for a specific purpose and covered only the formation of the Druskininkai tourism and health cluster model.

In 2011, a scientific feasibility study the 'Analysis of the Development Opportunities of the Creative Industry Cluster in Kaunas Region' was carried out (Tulušienė, 2011). However, like the previous study it was focused particularly to analyse the models of the functioning of creative industries clusters in the centre of Kaunas (Kaunas Old Town and Laisvės alėja) and to evaluate their developmental possibilities.

One of the most comprehensive studies of Lithuanian cluster researchers was prepared in 2012 – 'Cluster Studio2', in which:

- Analysis of the cluster concept has been performed
- An analysis of the effectiveness and impact of Lithuanian innovation policy on clusterization processes
- An analysis of the legal acts regulating or affecting cluster activities
- Review of Lithuanian cluster ecosystem
- An analysis of clusterization processes in foreign countries (Finland, Sweden, Norway)
- An analysis of essential strengths, weaknesses, opportunities and threats of Lithuania's cluster activities

- In order to increase the efficiency of cluster activities, the study offers suggestions on the external environment and internal processes
- Suggestions are presented on the efficiency of cluster efficiency and the establishment of indicators for the assessment and monitoring of the efficiency of clusters
- A certain measure was proposed to increase cluster awareness and prestige
- Three trends in the development of clusterization processes in Lithuania were presented (high-tech sector clusters, clusters as regional development engines and large clusters of traditional industry sectors)

Although this studio is very valuable, it is mostly focused on analysing the development of clusters themselves. The analysis of the manufacturing sector in this study in terms of clusterization was based on M. Porter's 'Diamond' model (2000) (see Figure 6).

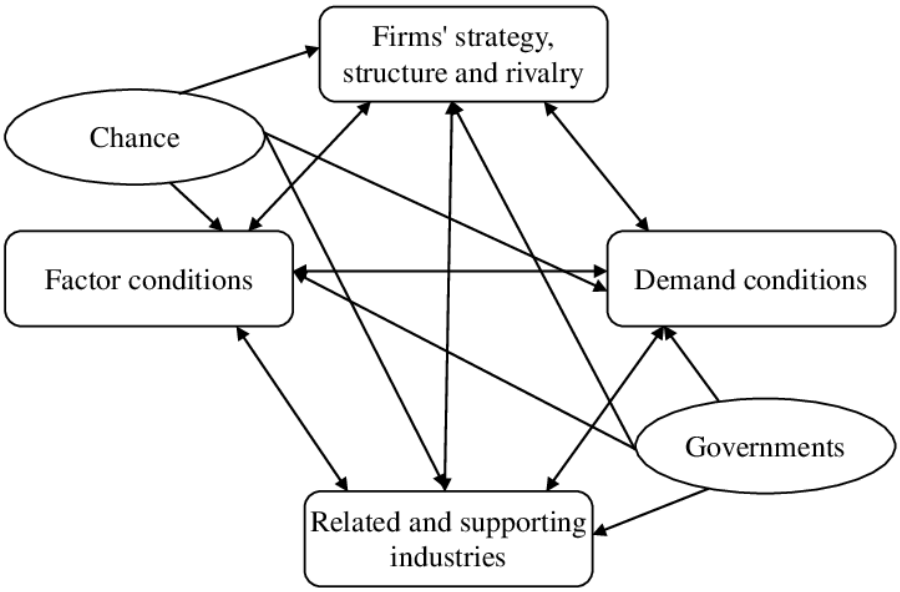

Fig. 6. M. Porter 'Diamond' model (Source: Porter, 2000)

The principle of the exclusion of criteria and criteria proposed by the authors is acceptable in addressing the scientific problem of this work, but several significant deficiencies of the proposed assessment system are observed:

1. the study actually focuses on the analysis of the sector's competitiveness, integrating just a few indicators of clusterization process
2. there are no concrete, measurable indices of the estimates justifying the objectivity of the research
3. the criteria and indicators apply to only one systemic unit, the industrial sector, without integrating the context of a country's economy, region, or the enterprises themselves
4. does not completely reflect the environmental dimension of the sustainable economy of the country and its criteria and indicators
5. only partially reflects the equivalent social dimension of a sustainable national economy (through human resources)
6. the survey largely covers the manufacturing sector (only the tourism sector was analysed from the services sector)

Another significant scientific work is found in the article by D. Štreimikienė and A. Mikalauskienė (2009) in determining the criteria and indicators indicating the impact of clusterization on individual dimensions of sustainable national economy. They used the methodology for calculating integrated indicators for monitoring the national energy strategy and for calculating the effectiveness of energy policy measures. The advantages of the assessment methodology they provide are:

1. clearly defined criteria and indicators indicating the impact of the analysed phenomenon on the individual dimensions of sustainable national economy (economic, social and environmental)
2. identify specific and measurable indicators that can be calculated on the basis of official statistics or other official and objective information
3. the criteria and indicator sets are analysed in a complex economic system, separately assessing their impact on the country, region and company itself
4. the established criteria and indicators can be supplemented, modified and withdrawn according to the needs depending on the subject matter

The study noted the following deficiencies in the system of evaluation of integrated indicators:

1. the subsystems of the economic system (the country, the region's economy and the results of the company) do not correlate with each other
2. there is a lack of further economic analysis of the subsystems of the chosen sector.
3. the research methodology has been applied to only one sector.

Nevertheless, a national energy sector research based on the integrated indicators method has been empirically verified and the results obtained have been found to be appropriate. (Štreimikienė, Baležentis, 2013). This allows us to formulate an opinion that the methodology of multi-criteria and integrated indicators is suitable for creating a methodology for research for this dissertation.

Ramanauskas, Gargasas (2011) have applied similar assessment methodology in their scientific research. They assessed the activities of rural tourism homesteads in the aspect of sustainable development. The study highlighted the key criteria for each dimension of sustainable development; with the help of experts, identified their relevance and importance (weighting factor) for the study and calculated the integrated indicator of sustainable development according to 1 formula:

$$DV = 0{,}33\sum_{n=1}^{n}(1/B_s)*S_s + 0{,}33\sum_{p=1}^{p}(1/B_e)*S_e + 0{,}33\sum_{m=1}^{m}(1/B_a)*S_a\,, \quad (1)$$

where: 0.33 - DV coefficients weight of social, economic and environmental;

Ss, Se and Sa respectively the assessment of social, economic and environmental DV evaluation and the total number of criteria set.

Bs, Be and Ba - the number of corresponding social, economic and environmental criteria in a particular research object (compliance with specific criteria is determined by experts), respectively.

This formula was also found in works by other authors with larger or smaller modifications. Therefore, it is to be understood that the methodology for the study of the impact of clusterization of a sustainable national economy should be expressed as an integrated indicator covering:

1. clusterization criteria that are consistent with the specifics of the sector (industry or service) and sustainable economic dimensions
2. the integration of all economic subsystems (country, sector, region, cluster, cluster participant)

In addition, depending on the research network, correlation between selected criteria and subsystems should be determined. These assumptions will serve as the basis for the study.

Conclusions

On the basis of scientific literature, the cluster conceptualization was systematized and it was concluded that despite their abundance, all of them are modifications to the definition of M. Porter (2000). The basic notion formulated by M. Porter (2000) states that the cluster is the geographical concentration of interconnected enterprises, specialized suppliers, service providers, related industries and associated institutions (e.g., universities, agencies, trade associations, etc.), which in a certain area compete with

each other and cooperate with each other. In the works of all other authors, the basic thought of M. Porter remains, only focusing on those elements that are relevant to their research objects. In this regard, it is concluded that the theory of clusters is relative and still being developed: in each case of a scientific study, it is possible to find different criteria that define the concept of clusters and the process of clusterization itself. However, the inclusion of clustering in Country Strategy Papers shows that the purpose and the benefits of this phenomenon are important at the state level, not to mention the economic policy of the regions.

The analysis of scientific literature revealed that the phenomenon of sustainable national economy, as well as the phenomenon of clustering, is relatively young. Therefore, it is still accompanied by an active scientific discussion both on terminology and on the alternatives to assessing the phenomenon itself. The abundant list of scientific literature has shown that scientists have even developed 4 different rating systems (by category) for the assessment of sustainable (sustainable) economics. The most popular and most commonly used is the calculation of the integrated indicator. However, the analysis of scientific literature revealed that there is not one commonly accepted method of evaluation.

In order to identify the criteria and indicators indicating the impact of clusterization on individual dimensions of sustainable national economy, an overview of research studies was done. Their analysis showed that there is almost no research on clustering assessment: all the studies actually focus on analysing the problems of development of clusters (especially of the industrial sector), rather than assessing the results achieved. However, the inclusion of clustering issues in country strategy papers makes it necessary to look for an answer whether this process contributes to the implementation of strategic goals and objectives. The answer should be evaluated by quantitative and qualitative methods, and the resulting estimate should be expressed as an integrated indicator.

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OCCUPATIONAL STANDARDS: A KEY TO IMPROVING MATCH BETWEEN SKILLS AND LABOUR MARKET NEEDS IN LITHUANIA

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Abstract. A country's qualification structure that meets the needs of the labour market and properly skilled professionals at different levels of qualification are the objectives targeted by each country, region and entity. Competencies demanded on the labour market determine the competitiveness of a person, entity and the whole country. In order to train professionals to better meet the labour market needs, solution formulas for the problems are sought in the field of infrastructure improvements, system management and other areas. This article analyses the opportunities for enhancing match of skills safeguarded by the national occupational standards in Lithuania, including the analysis of progress, problems and solutions.

Keywords: Economic development, human resources, labour market, national qualification system

JEL Classification: O10; O15; I25; P46.

Introduction

The efficiency of the education system and the quality of vocational education and training remain on the list of hot issues all the time after Lithuania regained its independence. Criticism by employers for the mismatch between skills supplied and demanded on the labour market, unfitness of graduates for practical work in the field of qualifications they acquire, the unattractiveness of vocational training, problems in the system of higher education and so on. In retrospect, it is the impression that the problems are not decreasing, but only getting worse.

In the search for efficient solutions to reform the whole system of education, infrastructure and organisational reforms usually receive more attention in the public space, while systematic reform of learning content, which has a crucial role in improving the quality of vocational training, has not been sufficiently addressed. Vocational training and study programmes are being continuously improved. Employers are also included in this process. Educational establishments try to take into account critical observations by employers. However, the lack of systematic information on the content of qualifications and their demand on the labour market, that is, what and how much to teach, remains to be the main obstacle to effective changes.

The education system is not able to respond to labour market needs and ensure the efficient process of labour training without reaching a consensus with employers on the content of qualifications in all economic sectors. Lacking such information at all stages, the education system does not have clear milestones that would enable specification of targets in vocational training and better consideration of economic needs in training and study programmes. Both are right in identifying the problems, but the situation in Lithuania does not change because of insufficient dialogue and cooperation between employment and education systems.

The purpose of the article is to assess the role of national qualifications system development and occupational standards in the qualitative content development of the vocational education and training system. The objectives of the article are: to overview the concept and role of the qualifications system and occupational standards, and their possibilities in anticipating the need for qualifications; to analyse progress made and problems encountered in relation to the developing occupational standards; to assess possibilities to develop stakeholder dialogue through the development of the qualification system and occupational standards.

The role of occupational standards in improving the match between qualifications and labour market needs

There are two challenges permanently confronting the system of vocational education and training: how many skilled workers and what skills are required (i.e., what to teach). Even very high qualification of an individual may be non-demanded on the labour market.

Research studies ('Analysis of the relevance of existing supply and demand for specialists and competencies 2011' and 'A map-study of the need for professionals and competencies 2010') on the needs for qualifications conducted and published to date are unjustifiably obsolete and, in terms of content, however, are confined to identifying the titles of professions (groups of professions) without identifying their contents. Therefore, practical application possibilities of research findings provide only general field-level information on trends in certain areas. This way, we appear caught in a trap of information and realistic situation: we know that we lack engineers, but not all skilled workers with engineering skills work as engineers; there is an oversupply of managers and lawyers in the market, but at the same time, there is a permanent need for (and even a lack of) high-quality managers and lawyers in the labour market.

Such a situation leads to the development of structural unemployment on skills level that may seem to be hidden in terms of qualifications/ professions behind individual's participation in the labour market (employment in other areas and picking up the required competencies on the job). This has become a systematic mass phenomenon which, inter alia, misleads young people at their initial stages of choosing a career. There was a long-dominating approach that it does not matter what to study; all that matters is to obtain a higher-education diploma which guarantees employment. Such practice represents indirect losses for individuals who waste time to acquire competencies useless in their occupational activity and have to re-skill themselves independently. Undertakings also suffer losses from spending time and funds for staff re-skilling. However, the main losses occur on the macro level where the system of education generates uncompetitive and unmarketable 'products' (Gordon 2015; Tūtlys & Aarna, 2017; Tūtlys, Kaminskienė & Winterton 2016; Tūtlys & Spöttl 2017; Reich 2006).

What information does the education system need? It is information on the identified current and future qualifications (a set of competencies necessary for relevant activities) needed in the labour market (Figure 1).

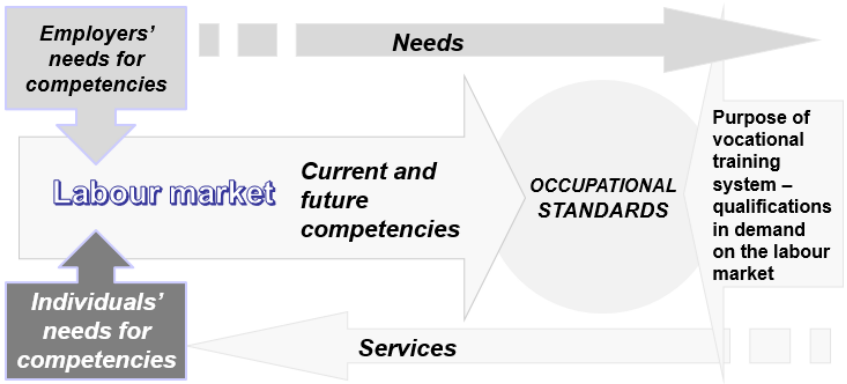

Fig. 1. Stakeholders' interests in the field of qualifications

A qualifications system, having as its axis the occupational standards that are a verified and recognised instrument of dialogue, serves as a mediator facilitating communication between different stakeholders (Coles, Keevy, Bateman, & Keating 2014; European Training Foundation 2014).

Occupational standard means a list of qualifications of all levels required for an economic sector or its part, competencies necessary to acquire these qualifications, and qualification award requirements (Law on vocational education… 1997). With the help of the described content of qualifications (current and

future, cognitive, functional and general competencies and their limits in all levels), occupational standards allow the aggregation and coordination of the objectives and needs of all stakeholders (individuals pursuing the acquisition of skills or up-skilling, labour market [employers] and education system) (Brown 2006).

Occupational standards are developed on the basis of the following principles: the interplay between the education and employment systems: priority on the needs of the world of work and consideration of the structure, experience and traditions of the Lithuanian education system; social partnership principle: cooperation of all stakeholders and genuine partnering in the development of qualifications; the principle of methodological soundness: compliance with the consistent theoretical concept of qualifications and qualifications system by ensuring coherence with the developing and improving European Qualifications Framework; transparency, completeness, comprehensibility and regular updates of qualifications.

Benefits of occupational standards:

For employers: the possibility to inform the education system of the existing qualifications that are necessary for ensuring the functioning of the economy and the content of such qualifications; the possibility to expect a better match between labour force and labour market needs through reduction of costs for job adaptation of career-starting graduates (reducing additional costs of additional training of recruited graduates); the possibility to develop a transparent pay system based on the level competencies, their supply and demand on the labour market.

For the education system: the possibility to improve and develop new vocational training and higher education programmes better matched to the labour market needs and thus improving the efficiency of vocational training services; the possibility to improve the assessment and recognition system for competencies acquired through practice, informal learning and self-learning.

For individuals: vocational guidance tool for youth; qualification improvement guide for professional career seekers; re-skilling guide for persons who wish to change their qualification or acquire a new one related to the one they have and/or to pursue recognition of competencies acquired through informal learning and self-learning.

The need to identify and describe in a systematic manner the occupational activities actually existing on the labour market and to shape qualifications on the basis thereof through the summary of information in sector-specific occupational standards determined the concept of the qualification research model (Andriušaitienė et al. 2008a; Šileika, Andriušaitienė, & Tūtlys 2008) and the ‘Occupational Standards Development Methodology 2017’.

Shaping the content of qualifications in the development of occupational standards

The Occupational Standards Development Methodology sets out that qualification shaping should follow a two-phase procedure. The first phase involves sectoral analysis from its general description down to the competencies necessary for the functioning of the sector and limits of such competencies; in the second phase, competencies are used as a basis for building general and special qualification units that comprise the qualifications (Figure 2).

The phase of qualifications analysis includes the analysis of the structure of the sector and its subsectors, sector-specific fields of professional activities and occupations, and their content.

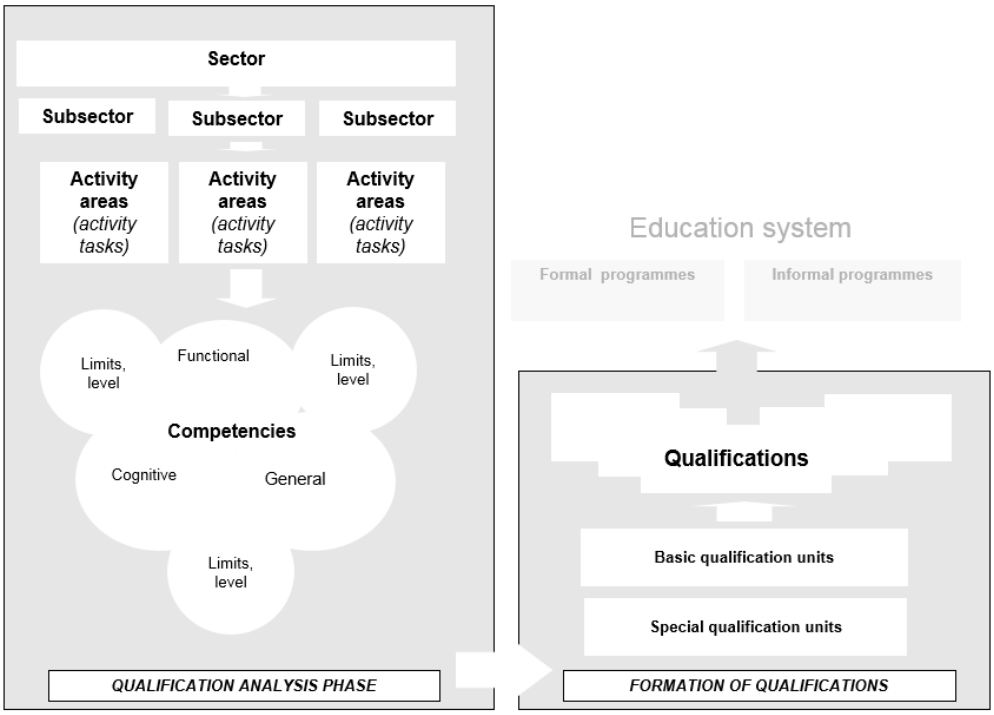

Fig. 2. Phases of occupational standards development

All stakeholders, that is, all interested parties, are involved in the collection of information. Information on the content of professional activities is collected from all possible sources, including job descriptors, occupations and qualifications, vocational training standards and other standards and documents (Figure 3).

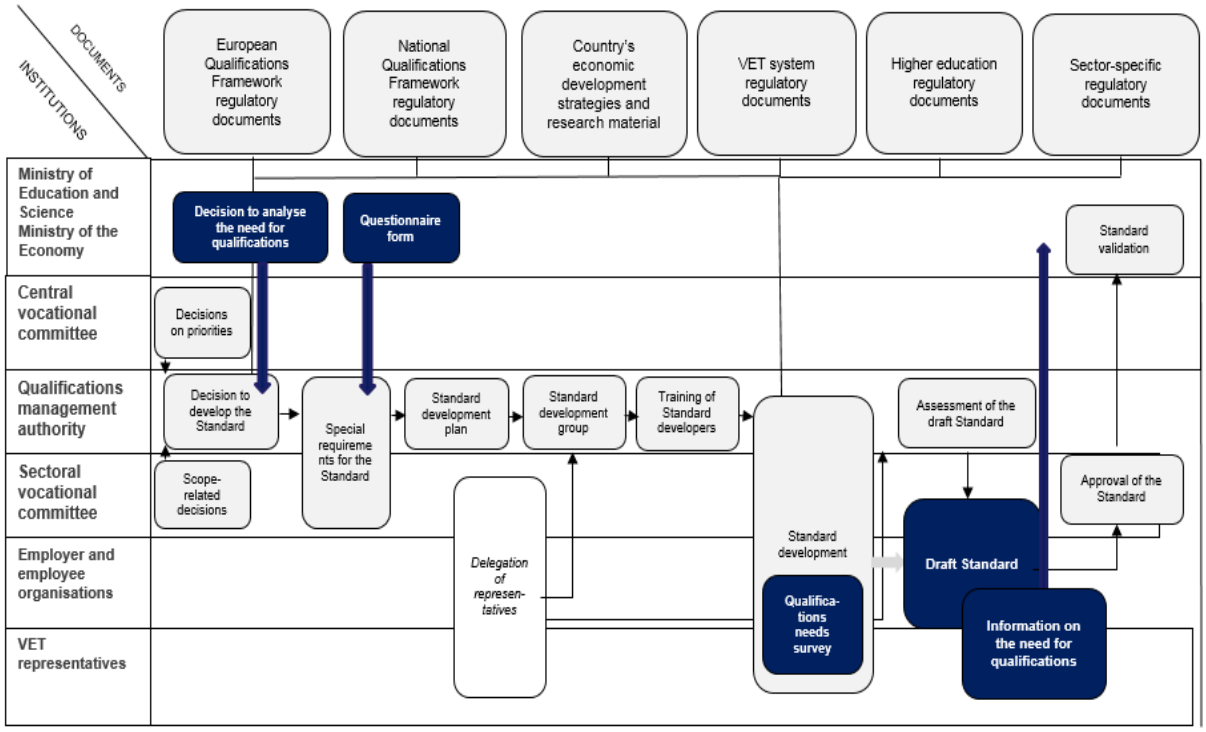

Fig. 3. Analysis of the need for qualifications in the process of development of occupational standards

However, the most important information is provided by employees on the post-related functions, competencies required in the workplace and their limits.

The analysis based on this principle and the qualifications developed on the basis of the relevant results and described in the occupational standards reflect the nomenclature of the qualifications actually existing in the economy (Andriušaitienė et al. 2008a; Šileika et al. 2008). Such information turns into clear and reliable guidelines for the education system to develop vocational training and higher education programmes.

The National Occupational Standard is intended to serve as a regulatory document. Adopted at a national level, occupational standards are consistent countrywide, coordinated with national employer and trade union organisations, approved by the authorised authority and applied by all education establishments and qualification assessment and recognition institutions. Approval of the descriptor of qualifications at a national level will allow codification of the titles and contents of qualifications of all levels in all of the economic sectors. The analysis and description of qualifications of all levels in a systematic manner, based on uniform principles, allows for the identification of the relationship between the qualifications required at different levels and provides a simple, clear and user-friendly system for describing qualifications and providing information on skilling and up-skilling opportunities.

There are even more opportunities. The model for the development of national occupational standards is easy to supplement with questions concerning the quantitative need for qualifications and projected future changes.

Setting up a database for research and publicity of the content dynamics and quantitative needs for qualifications would create opportunities to develop an efficient online qualification monitoring system that would have the capability of reacting quickly to the changing labour market needs in terms of competencies and their contents in any economic sector.

Results and challenges of the development of the National Qualifications System and Occupational Standards

The education system provides vocational training services to the employment system by training skilled workers of all qualification levels. However, so far, the assessments of skilled workers trained both in the VET system and higher education system have emphasised insufficient consideration of employers' needs. One of the main problems is the mismatch between quantitative and qualitative structure of labour force.

The education system is trying to tackle this problem by undertaking commitments on European Union, national and institutional levels. At the European Union level (The Bruges Communiqué… 2010), it is emphasised that responsibility for investing in VET and for shaping VET policy is the shared responsibility of national governments, social partners, VET providers, teachers, trainers and learners, who all have a mutual interest in closer cooperation. National reports on the education system to EU institutions emphasise efforts to improve the match between the education/studies system and societal/economic needs, highlighting that the education system assumes responsibility for the quality of training of skilled workers required in the labour market. One of the implementation measures for this is to develop a system of qualifications and occupational standards.

Despite a long list of objectives and numerous plans in this area, the situation remains complicated in terms of outcomes. In order to attract a large number of students, education and training institutions at all levels are still forced to compete by commercialising their programmes with unusual and attractive titles. Programmes that have different titles but are almost identical in the set of basic qualifications (differing only in specialisation profiles) are described differently. This causes problems not only for experts in the field to assess and compare the descriptors. The lack of certainty of programme outcomes, particularly in higher education, is also mentioned by employers whose judgements and criticism are supposed to serve as a basis for programme improvements.

What is in place and what we can boast of? National Qualifications System Development was a project implemented in 2005–2008, which delivered the following results: development of the concept of the

National Qualifications System, methodologies for qualification analysis, pilot occupational standards for the Construction and Hotels & restaurants sectors, collation and summary of global methodological experience and good practices, and methodological and methodical justification of the national qualifications system model taking into account country's experience in this area, traditions and realistic financial possibilities. One of the most promising results was the establishment of an independent institutional mediator between education and employment, the Qualifications Authority, which assumed the functions of qualifications inventory, the standardisation of qualification requirements and the creation, renewal and filing of qualifications. The staff of the Qualifications Authority was specially trained to continue a dialogue between stakeholders, cooperation and work in this field. However, in the environment of the global financial crisis, this work and related problems were found to be insufficiently important. As a result, the Qualifications Authority was abolished, responsibility for the development of the qualifications system was delegated to the Ministry of Education and Sciences and qualifications management functions were delegated to the Qualifications and Vocational Education and Training Development Centre.

After a break, Lithuania, which was one of the leading Member States in creating the national qualifications system, had to start the work from the beginning. The project 'Formation of qualifications and development of the modular vocational education and training system' implemented by the Qualifications and Vocational Education and Training Development Centre in 2010–2015 delivered ten draft sectoral occupational standards for accommodation and food services: energy; information and communication technologies; construction; transportation and storage services; manufacture of wood products and furniture; textile, apparel and leatherwear production; healthcare, beauty and wellness services; agriculture, forestry and fishery, and food production; engineering industry products. The preparation of 14 additional occupational standards intended to cover the remaining economic sectors started in 2016 within the project 'Development of the Lithuanian Qualifications System (phase 1)'. The pace of developing occupational standards and the National Qualifications System aimed at targeting the problems as mentioned above and fulfilling the commitments is encouraging. However, there is less optimism about what and how much is being done when we look at how it is being done.

The main outstanding challenges are:

1. *Insufficient dissemination of information and a lack of constructive attention at the level of national authorities.* Countries, which had already established and developed their qualification system, typically emphasised the importance of the system, allocated impressive funding, developed adequate infrastructure and trained appropriately qualified professionals (European... 2017; CEDEFOP 2017; Coles et al. 2014; European Qualification Framework 2018; Luomi-Messerer & Markowitsch 2006; Méhaut & Winch 2012; Nieuwenhuis & Shapiro 2004). Among the most impressive examples of qualification systems and occupational standards (we need, for example, to dismiss the ones of Australia and New Zealand as incorrect for comparison purposes in terms of funding possibilities) Ireland remains a good example for not only recognising the importance, benefits and potential of the qualifications system at national level, allocating adequate funding and creating infrastructure ensuring the functioning of the system, but also for initiating a national agreement on qualifications. As regards our experience, intermittent return to the started and abandoned activities illustrates the lack of consideration from some authorities in taking strategic decisions.

2. *Rigidity of the valid legislative occupational standards.* A frequent dilemma encountered in the process of improving the methodological basis for the qualifications system is whether to adapt to the existing legal provisions or to offer innovative solutions. The latter often get stuck in bureaucracy impeding the defence of the overall results. On the other hand, adapting the procedure of developing occupational standards to the valid legislative system requires certain trade-offs.

3. *The competence level of occupational standards developers*. Development of occupational standards is a relatively new practice in Lithuania. There are very few representatives from the education system and the world of work who have appropriate methodological knowledge and competencies. Project-based funding and related fragmentary participation in the projects do

not allow for building a pool of professionals required for the effective management of the activities at issue, not to mention competition. Experts face the challenge of shortages of skills at all stages of occupational standards development. This, in turn, results in errors the correction of which is time consuming and leads to reduced chances to obtain better quality. It should be remembered in this context that competition is possible only if there is a sufficient number of potential competitors (experts in this case). Therefore, it must be admitted that the project-based financing procedure involving calls for tenders for the development of occupational standards' development is inherently problematic and cannot be viewed as efficient. Those who have practical experience and demonstrate appropriate competencies may not necessarily win the tender, while inexperienced winning developers face the same challenges, that is, the lack of methodological knowledge and practical methodological skills.

4. *The lag in developing and implementing related IT projects*. National occupational standards for all economic sectors are developed without having in place an interactive database. The portal VET e-Content is in place, but it is intended only for hosting information and has no online functions for expeditious communication and dissemination of information to all stakeholders. The need for an online database has been frequently emphasised by the ETF (European… 2017): the absence of a database at the stage of developing occupational standards reduces the possibility to get more stakeholders involved in the process of development and assessment of the national instrument.

5. *Tender-based funding does not ensure social partnership.* The Qualifications and Vocational Education and Training Development Centre has been implementing projects for the development of occupational standards since 2010 and purchasing experts to perform project activities in accordance with the requirements for projects financed by the European Social Fund. The best solutions have been sought through international calls for tenders and delegation of functions and responsibilities to social partners (associated employers' organisations) with no call for tenders. The efficient functioning of the qualifications system as a whole is not possible without the active engagement of all stakeholders at all stages and in all processes. This is a fundamental principle at the stage of occupational standards development. Unfortunately, the tender-based funding for developing occupational standards has not only failed to ensure the participation of all social partners of the relevant sector in the development of occupational standards, but even pitted them against each other: organisations and professionals contacted for information or opinion, unfortunately, had reason to abstain ('let those who won and are paid work...'). This is a problem for which solutions in relevant sectors will be fairly laborious even in future periods. Problems with the consistency of occupational standards are in large part due to the tender-based funding procedure for the development of occupational standards, which leads to competition and related indirect confrontation instead of partnership.

However, the above-described organisation of occupational standards' development, although in line with the legal provisions in force in the country, has fallen well below expectations: it has not ensured the quality of occupational standards, has not facilitated the creation of social partners' network and has not created the opportunities to train the required number of professionals able to ensure the continuity of work in accordance with uniform methodological principles.

The network of genuine social partnership as the key to solving the problem of the match between qualifications and economic needs

There are two main parties – employment and education systems – in the development of occupational standards. The mission of the employment system is to be involved in the identification of the existing situation by determining the relevant nomenclature of professional activities, the competencies required for them and future competence needs, as well as basic and specific competencies, and limits thereof, in specific professional activities. Simply put, the employment system should manifest what it needs in terms of qualifications and competencies (Figure 1).

Thus construed, the mission of the world of work means that the role this world plays in the development of occupational standards is not that of an assistant or advisor. Together with the education system, the world of work is one of the main developers and users (European… 2017; CEDEFOP 2012; CEDEFOP 2017; Coles et al. 2014; Andriušaitienė et al. 2008b; Lauder et al. 2006; Winterton 2007).

As mentioned above in the analysis of the challenges faced in developing the qualifications system, country's achievements prompt a mixed appraisal: the first few important steps made are encouraging, but there are concerns that the errors made may reverberate in future work, in particular with regard to perspectives for building a genuine partnership network of all stakeholders based on modern communication and for creating and managing information related to qualifications' content.

How to do this? What is necessary for the social partnership network capable of guaranteeing high-quality results of qualifications system development in reference to occupational standards (Figure 4)?

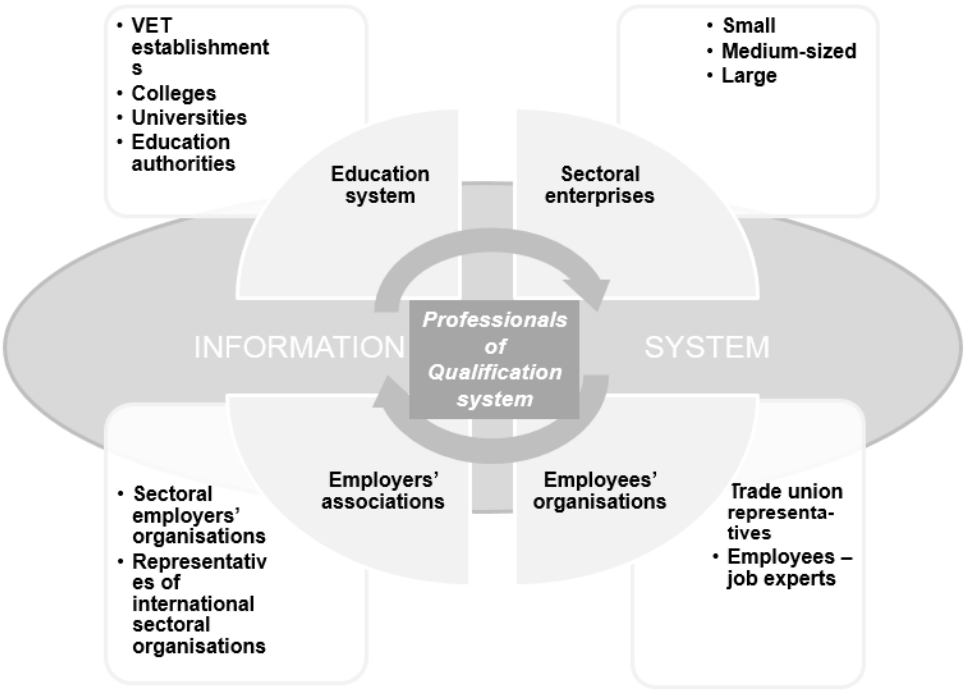

Fig. 4. Social partnership in the development of occupational standards

With a relatively strong methodological basis and methodologies, the creation of a network for a functional, genuine social partnership to address matters related to qualifications requires only three solutions: a more liberal concept, a modern IT instrument and a competent team capable of engaging stakeholders in concerted work and process management.

Methodological axis – more liberal concept of occupational standards. The quality of national occupational standards and their approval in the employment and education are the guarantees of their functionality. It is reasonable to refrain from the provision that occupational standards are subject to approval at a national level (according to the existing regulation, occupational standards require approval by two ministers). A more liberal concept of occupational standards as an information system about sector-specific needs would be more consistent with the essential function of the occupational standards and ensure their functionality and viability.

Worldwide experience shows that countries that first developed the standards as strictly regulatory documents adopted at a national level faced opposition regarding too heavy regulatory embrace and had to change direction by replacing the stringent provisions with the concept of guidance information (Global…, 2017). This helped to solve two problems: to reduce opposition to stringent requirements and

to create conditions for occupational standards to better fulfil their core role of being a dynamic source of information on constantly changing needs of the world of work in the field of competencies. If occupational standards are construed as competence descriptors based on uniform principles in an open, liberal information system accessible by all of the stakeholders, the standards become a product approved by all of the stakeholders. So, this is the most reliable indicator of quality.

Innovative information system based on modern methods of communication. Development of the qualifications system is not an end in itself. The content of qualifications that takes into consideration the needs of the world of work must be as dynamic as is the sector for which the standards are developed. One-off development of high-quality descriptors of qualifications and their entrenchment in an occupational standard can only be, at best, a quality instant print of sector's qualifications. The field of creating the system should not be paper but a modern, adequately functioning IT tool. The development of such a tool, that is, of the information environment based on modern methods and possibilities of communication, would be the easiest way to facilitate the formation of a partnership network. This would give all the stakeholders the opportunity to become information providers, promptly responding to the changing content of qualifications and needs for them.

Qualification management solutions. Occupational standards should be hosted by a sufficiently empowered institutionalised team, subordinate to none of the main stakeholders (employment and education systems), which would manage the flow of information on the content of qualifications and needs for the same. This competent organisational and coordination core could be composed of a group of professionals and researchers with appropriate competence, regularly upgrading their qualifications and acquiring new necessary competencies, and having the expertise to deal with problematic issues. Independence from any of the stakeholders gives the opportunity to shape impartial priorities and relevant strategic decision, whereas the practical experience of the professionals, in particular, the lessons learnt from mistakes, leads to a higher quality of the standards.

The potential solutions mentioned above would allow much better results to be achieved at the lowest cost. The concept of the national qualification system serves as methodological guidance for this.

Conclusions

A country's qualification structure that meets the needs of the labour market is one of the priority objectives of the country. However, the country's education system lacks clear information on the content of the qualifications required by the labour market needs. A better match and efficiency of education services are sought through the development of occupational standards, which describe the contents of qualifications at all levels in a relevant economic sector. The developed occupational standards should be a reliable reference for the education system with regard to the qualifications existing in the country's economy and their contents.

Lithuanian model for the development of occupational standards provides the possibility to supplement it with analysis of quantitative needs for qualifications. The improved model of qualifications research would enable the ongoing monitoring of the quantitative needs for qualifications actually at no extra cost and would guarantee the possibility for the education system to promptly receive information and respond to the changing situation with qualifications in any economic sector.

However, the pace of developing the National Qualifications System is not viewed unambiguously. The optimistic aspect is that ten occupational standards are already in place and fourteen more are on the way. The main challenges preventing the development of qualifications system from reaching the expected pace include insufficient dissemination of information and lack of constructive attention at the level of national authorities; rigidity of the valid legislative system; the competence level of occupational standards developers; the lag in developing and implementing related IT projects; tender-based funding which does not ensure social partnership.

The key to solving the problem of the match between qualifications and economic and labour market needs is a network of genuine social partnership. With a relatively strong methodological basis, the creation of a network of functional, genuine social partnership for addressing matters related to qualifications requires only three key solutions: a more liberal concept, a modern IT tool and a competent

team capable of engaging stakeholders in joint work and process management. Such solutions would allow for the establishment of an online partnership network for qualifications and achievement of better results.

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