SZAKNYELV
ÉS SZAKFORDÍTÁS

Tanulmányok a Szent István Egyetem szaknyelvi kutatásainak eredményeiről

2018

Szent István Egyetem, Gödöllő
Gazdaság- és Társadalomtudományi Kar
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TARTALOM

SZERKESZTŐI ELŐSZÓ

A Szent István Egyetem Gazdaság- és Társadalomtudományi Kara 2017 szeptemberében először indította az *Idegen nyelvi szakmai kommunikátor* szakirányú továbbképzését, felismerve a szakmai idegen nyelvi ismeretek és készségek fontosságát az egyetemisták és a kutatók számára. Az új képzés célja, hogy a szakmai idegen nyelvi témák és készségek minél nagyobb skáláját fejlessze, ennek jegyében alakítottuk ki a szakirányú továbbképzés tantárgyi összetételét és tantárgyi tematikáit. Oktatunk szakmai kommunikációt, kommunikatív nyelvtant, szakmai szókincsbővítést, szakmai szövegértést és tudományos művek írását. A szakirányú továbbképzés teljesítésének feltétele egy tudományos cikk megírása, amely a hallgató kutatási eredményeit mutatja be. A *Szaknyelv és Szakfordítás* 2018-as kiadványa az *Idegen nyelvi szakmai kommunikátor szakirányú továbbképzés* végzős hallgatóinak kutatási eredményeit tartalmazza tudományos cikk formájában. A kutatás mindegyike izgalmas és tanulságos olvasmány, hallgatóink kitartó és alapos kutatómunkáját szemlélteti.

Ezúton köszönjük meg hallgatóink lelkesedését, motiváltságát, és az elmúlt két félév közös tanulását! Külön köszönet jár dr. Szalay Zsigmond Gábornak a kiadvány tördeléséért. Élmény volt Veletek dolgozni!

A szerkesztő

HR TRENDS IN 2018

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Abstract

This thesis aimed at examining the HR trends expected and forecast in 2018. The forecasts of individual HR experts are well known, although, no summary or comparison – which could help to get a more reliable prediction regarding HR trends – has been made so far.

Therefore, it raised some questions such as what kind of changes the international and domestic HR experts predict to occur for the year 2018, whether there will be common intersections, and if so, which ones. I carried out document analysis. The information collected during the research was compared and analyzed, and the results were summarized in a table and in a bar chart as well. The findings clearly showed that there are basically three areas that will be influenced by the following changes: changes related to digitization, changes in employee satisfaction and work related changes. As a result of the research, it could be stated that in the forthcoming years HR will face significant transformation. Digitization will be the most important area.

Keywords: Human Resource/Human Resource Management, trends/changes, digitization, employee satisfaction, work.

1. Introduction

According to Mahatma Gandhi, India's former political and spiritual leader, the best way to find ourselves is to get lost in the service of others. I really like that idea. That is why I have chosen a profession, in which serving others could be the part of my everyday life and that is why I have become a human resource (hereinafter: HR) expert, who is passionate about her profession. Finally, that is the reason why I am open and interested in professional novelties, innovations and trends.

In line with what has been said above, I have chosen HR related changes as a topic of my thesis, which are expected to take place in the near future.

Future researchers – who can also be called futurists –, trend analysts and HR specialists of global companies agree that in the forthcoming years HR will face the biggest changes in the corporate world. Therefore, it can be said that revolutionary changes are inevitable, but the question is which currently existing sub-areas of HR the transformation will be influenced, or whether new HR areas will be created, and if so, which ones.

1.1. Definitions

Before getting right to the point, it is necessary to clarify some important definitions regarding the topic:

- Human Resource Management (HRM/HR – both acronyms are synonyms of the same concept): Dr. Armin Trost (2013), professor of HRM at the Hochschule Furtwangen University takes the view, that 'Human Resource Management involves all planned and controlled activities of an organization to build and maintain the relation between employees and the organization in order to meet both business objectives and employee expectations' (Trost, 2013).

- Trend: according to the *Business Dictionary*, the word trend means ‘a pattern of gradual change in a condition, output, or process, or an average or general tendency of a series of data points to move in a certain direction over time, represented by a line or curve on a graph’ (Business Dictionary – www.businessdictionary.com).
- KPI – Key Performance Indicator: in the interpretation of *Klipfolio* ‘a Key Performance Indicator is a measurable value that demonstrates how effectively a company is achieving key business objectives’ (Klipfolio – www.klipfolio.com).
- Chatbot: according to Matt Schlicht (2016), Founder of Chatbots Magazine ‘chatbot is a service, powered by rules and sometimes artificial intelligence that you interact with via a chat interface’ (Schlicht, 2016), in short it is an automated messaging system.

1.2. Research questions

In my thesis I am looking for the answers to the following research questions:

1. What kind of HR trends and changes do international and Hungarian HR experts predict to occur for the year 2018?
2. Will there be common intersections, and if so, which ones?

1.3. Hypotheses

In my view, there will be significant changes in two areas:

1. Hypothesis 1.: It is hypothesized, that widespread proliferation of digitization is one of the major changes.
2. Hypothesis 2.: It is hypothesized, that the other change is a much more intensive pursuit of employee satisfaction and the endeavor for the retention of the best performing workers.

It is believed that international and domestic professional opinions and trends will support my hypotheses in these two areas, but there might also be significant differences in many other points.

1.4. Method of the research

In my research paper, I will summarize the opinions of specialists and trend analysts who take a stand on significant international – mainly Dutch, American, Finnish and German – and domestic HR portals. I will look for common points predicted by some experts, the findings will be analyzed, and the main trends identified and reported in these articles.

1.5. Method of the paper

The rest of the paper is organized as follows. The second section demonstrates the individual expert’s opinions about HR changes. The third section summarizes and reports the results: it presents the summary of the HR expert’s opinion and the significant HR trends for 2018. The fourth section concludes.

1.6. Aim of the research

The aim of my research is to collect current and latest information about HR changes, making the operation of the organization – which I work for – more successful, and my colleagues – whom I love to serve, help and support – more satisfied.

2. Methods

The collection of current data was made by reviewing relevant international and domestic professional websites. Among the information found during the research period, the following ones are worth publishing.

2.1. Background

Looking at the history of HR, the evolution of HR thinking can be observed. Competences and other assessment forms have come to the foreground (Csehné Papp et al., 2017a; Varga et al., 2017) but another key issue is finding the poporer work-life balance (Csehné Papp et al., 2017b). HR began in the 1930's and 40's, and at that time it focused on the administrative systems of work: managing the employment processes, the terms and conditions of work contracts. Thereafter, the tasks of HR shifted to the monitoring of HR practices, and a lot of focus was on staffing, training programmes and compensation packages, and on how to implement these practices effectively. In the last 15 years, HR has been working in close cooperation with the management, or even become part of the top management as a strategic business partner.

Dave Ulrich, the American university professor, author, speaker, management coach and management consultant, who has been named the most influential thinker in HR of the decade claims in his book *Human Resource Champions* that 'HR has focused too much on pleasing top management, and forgot to develop one of the other key roles: Employee Champion' (Haak, 2017).

2.2. Predictions of the experts

2.2.1. Tom Haak, Director of HR Trend Institute (Dutch)

Tom Haak (2017), founder and first Director of the Dutch HR Trend Institute shares Dave Ulrich's views. He thinks that 'understanding the wishes, needs and capabilities of employees is getting more important' (Haak, 2017). In the last years a trend can be seen: shifting back to a more employee centric approach. What else does he and the Dutch HR Trend Institute predict for 2018 regarding HR?

1. From PTB (please the boss) to EI (employee intimacy): HR will see a revolution in which understanding the demands and identifying the competencies of employees will be more important than pleasing the management.
2. Renewed focus on productivity: HR will need to hire fewer people, and at the same time use the potential of the employees more effectively.
3. Power to the people: employees will be expecting to be more proactive, to be more independent from organizational initiatives.
4. The end of fixed jobs: members of teams will not be made of a specific organizational unit, but of people who have the best skills to accomplish the given task.
5. Learning in real time: there will be changes in learning and training methods – instead of classroom training for groups allowing individual learning through easy access to learning materials.
6. Hospitality and Service: there will have to be created a top-notch HR service center for a positive candidate and employee experience.
7. Shrinking HR teams: the number of jobs in HR services will decrease as the level of automation increases.
8. Letting go: this trend is related to trend number three in this list – organization will have to stimulate the initiatives of talented people, it means less planning and control will be required (Haak, 2017).

2.2.2. Josh Millet, CEO of Criteria Corporation and Contributor of Forbes Human Resource Council's (American)

The American Josh Millet (2017), CEO of Criteria Corporation – a pre-employment testing company that helps companies measure candidates' cognitive skills – and Contributor of Forbes Human Resource Council's thinks that in 2018 there will be a big internal shift, the focus will be shifted on technology: how it can be used to find, connect, engage or replace people, and what to do when that happens. In his Forbes published article he spoke about five big trends and they all involve technology:

1. Passive candidates: the advent of social media and other online communications methods have made getting in touch with candidates, even with passive ones, easy.
2. A remote workforce: working virtually – at home, at a coffee shop or everyplace there is Wi-Fi – is also a growing trend in the United States.
3. Blind hiring: digitizing of as many parts of the hiring process as can be.
4. Gamification: turning HR processes (for example hiring process) into a competitive game.
5. Future-proofing employees: a lot of positions are going away because of evolving technology; companies have to look at their human resources and determine the best way to pivot them into future positions (Millet, 2017).

2.2.3. Michelle Lanter Smith, chief marketing officer and human capital management expert at EPAY System (American)

The American Michelle Lanter Smith (2018), chief marketing officer and human capital management expert at EPAY System deeply believe in four major HR Trends for 2018:

1. Flexible work schedules: work-life flexibility is a priority for Millennials.
2. A growing remote workforce: according to a study by Global Workplace Analytics 80-90% of the American workforce would like to work remotely at least part time.
3. Social recruiting on the move: social media, like LinkedIn, Twitter and Facebook and job application on smartphones will play an important role in recruiting.
4. Using technology for HR program management: there will be a migration towards cloud-based HR application – from performance management to HR analytics (Smith, 2018).

2.2.4. Taru Salo, HR Director of Destia (Finnish)

Taru Salo (2018), HR Director of the Finnish company Destia – after taking part in the HRcoreLAB conference in Barcelona, on 13th and 14th March 2018 – had the following observations and takeaways:

1. Development of HR technology: it will have an impact on the performance of the future organizations.
2. Enhancement of analytics: it will be seen in the future.
3. Learning via e-learning tools: learning will dramatically change via e-learning tools.
4. The employee experience will have to be aligned with the employee expectations: the war for talents will be a global issue, the next step will be to improve the employee experience and the employer brand together with marketing.
5. Analysis and measuring of the candidate experience: the candidate experience should be analyzed and measured as the customer experience.
6. Separation of operational and strategical HR: operational HR will have to be separated from strategical HR to have time to review long-term questions (Salo, 2018).

2.2.5. Global Human Capital Trend Study (German)

In Germany for the Global Human Capital Trend Study (2017) 10,400 HR and business decision-makers were surveyed on the topic of 'New Rules in the Digital Age'. The research has led to the following findings:

1. Building up the organization of the future: this will not be about new organizational charts but about developing flexible ecosystems and networks that can reorganize themselves.
2. Leadership in transition: organizations will need transformable, multipurpose executives and concepts, which can react fast on digitization and its impact.
3. Different career and learning methods: new drivers, modern learning models will be required for a successful working life.
4. Changing in talent acquisition: digital recruiting will help companies to find employees through new channels.
5. Digital HR: digitizing HR platforms will be required for creating digital workplaces where employees can collaborate and communicate virtually and independently.
6. Renewed performance management: the focus will be on performance management approaches that enable a quick, direct, KPI-driven assessment.
7. More human employee experience: positive employee experiences from the initial contact to the resignation must be guaranteed.
8. Revolution in people analytics: people analytics will become a management task and no longer a technical discipline for selected data experts.
9. Changing in diversity and inclusion: responsibility for challenges like fairness, equality and inclusion can no longer be given to the Human Resource Department, they will belong to the tasks of the management.
10. Workforce 4.0: it will include freelancers, short-term workers, crowd-sourcing, furthermore use of robotics, artificial intelligence and cognitive technologies (Personalmanagementwissen Online – www.perwiss.de, 2017).

2.2.6. Profession, one of the most prominent jobs portal in Hungary (Hungarian)

Last, but not least just have a look at the Hungarian HR Trends. It can be indicated, that technological development has sparked HR missiles as well. According to Profession (2017) – one of the most prominent Hungarian online jobs portal – the following HR trends are expected in 2018:

1. Remote work: the virtual working ability will become more and more accepted.
2. Changes in working time: fixed work hours will be replaced by performance-based wages.
3. Changes in personal data protection: the protection of stored personal data will be a priority.
4. The expansion of predictive analytics: roles that can be used for data analysis and other analytical tasks will have an increasing role.
5. Recruiting passive candidates: the strategy for recruiting passive candidates will be significantly transformed.
6. The growing role of employer branding: companies will have to do everything they can to show their advantages to their future colleagues.
7. Blind hiring: technological progress will enable the so-called blind hiring; it will be important that the interviewer's first impression and private opinion do not influence the outcome of the recruitment process.
8. Gamification: commitment to a particular HR activity will be built on the basis of a competitive game.

9. Online training, coaching (Kunos et al, 2016, Veresné Valentinyi, 2016, 2018) and talent management: continuous learning and further education will be conducted online in the future.
10. Chatbots: the automated messaging system will relieve the work of HR professionals (Profession – www.profession.hu).

Based on the survey of relevant literature and their analysis and assessment, the conclusion was that the most important HR trends for 2018 are related to the digitization.

3. Results

According to Dutch, American, Finnish, German and Hungarian specialists and trend analysts, the following changes are expected in the world of work in 2018:

Trends	HR Trend Institute (Holland)	Josh Millet (USA)	Michelle Lanter Smith (USA)	Taru Salo (Finnland)	Global Human Capital Trend Study (Germany)	Profession (Hungary)
1.	From PTB (please the boss) to EI (employee intimacy)	Passive candidates	Flexible work schedules	Development of HR technology	Building up the organization of the future	Remote work
2.	Renewed focus on productivity	A remote workforce	A growing remote workforce	Enhancement of analytics	Leadership in transition	Changes in working time
3.	Power to the people	Blind hiring	Social recruiting on the move	Learning via e-learning tools	Different career and learning methods	Changes in personal data protection
4.	The end of fixed jobs	Gamification	Using technology for HR program management	Employee experience in accordance with employee expectations	Changing in talent acquisition	The expansion of predictive analytics
5.	Learning in real time	Future-proofing employees		Analysis and measuring of the candidate experience	Digital HR	Recruiting passive candidates
6.	Hospitality and Service			Separation of operational and strategical HR	Renewed performance management	The growing role of employer branding
7.	Shrinking HR teams				More humane employee experience	Blind hiring
8.	Letting go				Revolution in people analytics	Gamification
9.					Changing in diversity and inclusion	Online training, coaching and talent management
10.					Workforce 4.0	Chatbots

Table 1. The opinion of individual experts on HR changes

The different colors in the table indicate changes in the following areas:
expected changes relating to digitization,
changes in employee satisfaction,
changes in work-related processes,
miscellaneous.

3.1. The results in detail

Expected changes related to digitization:

1. learning in real time,
2. shrinking HR teams,
3. passive candidates,
4. a remote workforce,
5. blind hiring,
6. future-proofing employees,
7. a growing remote workforce,
8. social recruiting on the move,
9. using technology for HR program management,
10. development of HR technology,
11. enhancement of analytics,
12. learning via e-learning tools,
13. leadership in transition,
14. different career and learning methods,
15. changing in talent acquisition,
16. digital HR,
17. workforce 4.0,
18. remote work,
19. changes in personal data protection,
20. the expansion of predictive analytics,
21. recruiting passive candidates,
22. blind hiring,
23. online training, coaching and talent management,
24. chatbots.

Changes in employee satisfaction:

1. from PTB (please the boss) to EI (employee intimacy),
2. hospitality and service,
3. gamification,
4. flexible work schedules,
5. employee experience in accordance with employee expectations,
6. analysis and measuring of the candidate experience,
7. more humane employee experience,
8. changes in working time,
9. gamification.

Changes in work-related processes:

1. power to the people,
2. the end of fixed jobs,
3. letting go,
4. separation of operational and strategical HR,
5. renewed performance management,
6. revolution in people analytics,
7. changing in diversity and inclusion.

Miscellaneous:

1. renewed focus on productivity,
2. building up the organization of the future,
3. the growing role of employer branding.

The study reports a total of 43 changes of these:

- 24 changes are related to digitization,
- 9 changes are forecast in employee satisfaction,
- 7 changes are foreseen in work-related processes,
- 3 changes are predicted in miscellaneous issues.

The percentage of the numbers:

- 56% of the changes are related to digitization,
- 21% of the changes are forecasted in employee satisfaction,
- 16% of the changes are foreseen in work-related processes,
- 7% of the changes are predicted in miscellaneous issues.

3.2. The results in a bar chart

For a better visual summary, Figure 1. presents the results of the study in a bar chart.

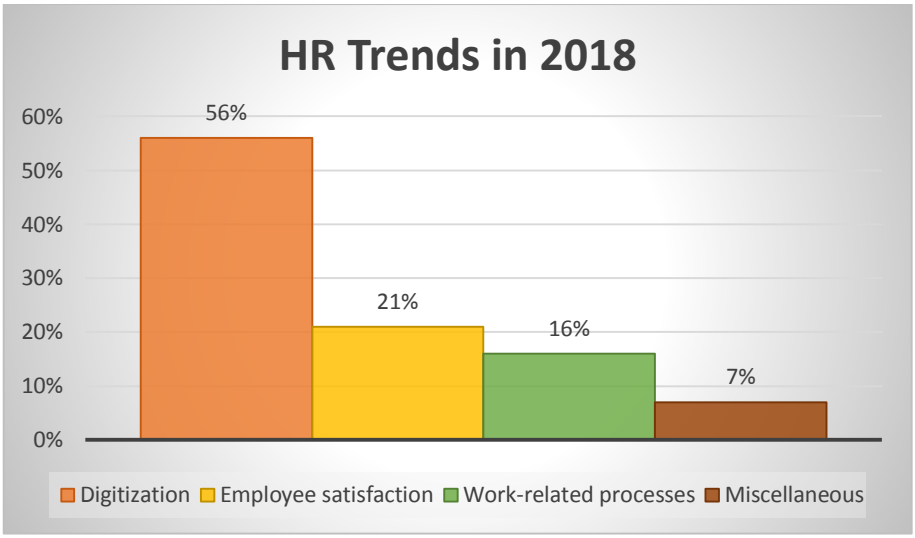

Figure 1. Relevant areas in connection with HR changes
(Source: Author's own figure)

3.3. Summary of the results

The findings indicate that biggest changes – 56% of the changes – will be due to digitization. There is not a huge difference between the second and the third items in the ranking: 21% of the changes are expected in the area of employee satisfaction, 16% of the changes are foreseen in work-related processes. Miscellaneous changes – 7% – are not substantial.

4. Discussion

The purpose of the study was to investigate what kind of HR trends and changes HR experts predict for the year 2018 and whether there will be common intersections, and if so, which ones.

I hypothesized, that in the forthcoming years HR will face significant changes on two areas: digitization and employee satisfaction.

My hypotheses are partially justified. The findings clearly show that there are not only two, but three areas where changes are expected:

1. changes related to digitization,
2. changes in employee satisfaction,
3. changes in work-related processes.

The most important area is digitization. According to experts, most changes are expected in this field. Of course, digitization will not fully replace the role of human labor. There will still be tasks which can be performed only by a human.

The list of trends identified during the research can be expanded, and the result should be further confirmed by taking into account the opinion of other experts.

Mariann Nagy, one of the authors of the Hungarian Magazine, *Piac és Profit,* cites Uwe Tigges (2018), CEO of Innogy SE in Germany, who thinks 'as a consequence of digitization, in the next seven years, 3 million jobs will become redundant only in Germany. In Hungary, this can influence more than half a million jobs. However, this should not be seen as a threat, much more a challenge, a chance, an opportunity to increase competitiveness. In the digital world network-, platform- and project-based jobs will become widespread. We will not work in a single workplace, the new generation will think more openly and flexibly, and these expectations need to be adapted not only by individual employees, but by entire organizations as well' (Nagy – Tigges, 2018).

There is a revolution in human resource management. HR departments have to decide if they are willing to participate in this revolution or it will devour them. There is no intermediate option. This is exciting and scary for HR leaders at the same time.

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REVIEW OF TALENT MANAGEMENT IN COMPANIES IN HUNGARY

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Abstract

Talent management, which is competitive advantage for companies, plays key role in human resources management. The focus of the research paper was to evaluate the application of talent management in enterprises of Hungary. The paper begins with the explanation and the definition of talent and talent management. Based on the literature that presents theoretical models of talent management we can see how many factors influence the successful operation of talent management. But only few researches focus on the size of company. I highlight the correlation between talent management and the size of the company. Therefore, I have designed research in which parts of a successful talent management model are examined with companies of various sizes. I used questionnaires with a Likert scale to analyse. My hypothesis and the results of previous researches were refuted as the size of the company does not correlate with the implementetion of talent management. The paper also provides implications for HR professionals and discusses directions for future research. According to my findings, traditional talent management is important although it has been forecast by myself that it will be replaced by the concept of people management.

Keywords: talent management, strategy, SME, HR

1. Introduction

„Talent management is more than just a competitive advantage; it is a fundemental requirement for a business success" (Silzer&Dowell)

A talented employee is a business advantage for the company. The firm's employees are the only true and authentic business variable in the long run. To have the right people at the right places and at the right time is critical for any organization to achieve competitive advantage. In addition to talent, competencies also count to a great extent and therefore, it is essential to be aware of the pool of skills expected by employers and also what competencies education can provide (Juhászné Klér – Varga, 2016; Varga et al., 2015; Csehné Papp et al., 2017; Varga et al. 2017, Kozma, 2013; Kozma et al., 2012). So one aspect of economic competition is gaining and retaining a talented employee today. Talent management (TM) are beneficial and profitable for the companies in all cases. It means that, we use talent based technologies when we recognize the benefits of a talented employee and the disadvantages of losing a talented employee. In my personal view, the concept of *talent* is not easy to define.

1.1. Theoretical background

Today, in the Hungarian language there are at least three meanings for the word *talent*. According to Interpretative Handwriting Theory, talent is (1) an ancient monetary unit, (2) has above the average ability, (3) has high-skills qualification[1]. In economic terms, the concept of

[1] Source: http://mek.oszk.hu/adatbazis/magyar-nyelv-ertelmezo-szotara/kereses.php?kereses=talentum

talent has been transformed and extended. In the following part, I will describe the most commonly used concepts of talent in the literature.

The best-known and most widely used theory is the so-called three-ring model by Renzulli. He identifies three different components of talent such as abilities above average, commitment to task and creativity, but all three components should be present at the same time (Renzulli, 1978). A Hungarian researcher, Czeizel, supplements and extends Renzulli's modell, and determines four talent factors. According to Czeizel, talent has four genetic features like general sense, specific mental conditions, creativity and motivation, and four environmental factors such as family, school, peer groups and general social environment (Czeizel, 2004). In Hungary, the Czeizel-model is adopted. Michaels et al. (2001) discovered that *talent* is the sum of all the abilities of a person: his inner abilities, knowledge, experience, intelligence, judgment, attitudes, character and motives, and the ability to learn and develop. Transley (2011) identifies *talent* as an expression of an ability, skills and accomplishment, or a combination of these, which implies that *talent* can be acquired and developed. In agreement with Csíkszentmihályi (2010), 'talent is much more a process of development than a particular personal feature' (Csíkszentmihályi, 2010: 49).

To summarize the above definitions, for the emergence of *talent* essential mental abilities, special mental conditions, creativity and motivation are indispensable.

Some of the theories show *talent* in the working environment. CIPD (Chartered Institute of Personnel and Development, UK) sees talents as those who can make the greatest difference to the organization´s performance, either through their immediate contribution or in the long run by demonstrating the highest levels of potential (CIPD, 2007). In Ulrich's point of view, *talent* means competence, commitment and contribution. 'Talented workers have all three elements if either one is missing, the other two do not make up for it' (Ulrich, 2007: 1). According to Williams (2000), the advantage of employing talents is that the organization can quickly respond to unexpected situations, adaptivity and flexibility will characterize organizational structures.

Differentiated *Approach to Talent in an Organisation* (see Figure 1.) demonstrates how to divide employees into segments for the company to utilize as much as possible of the advantages of employing talents.

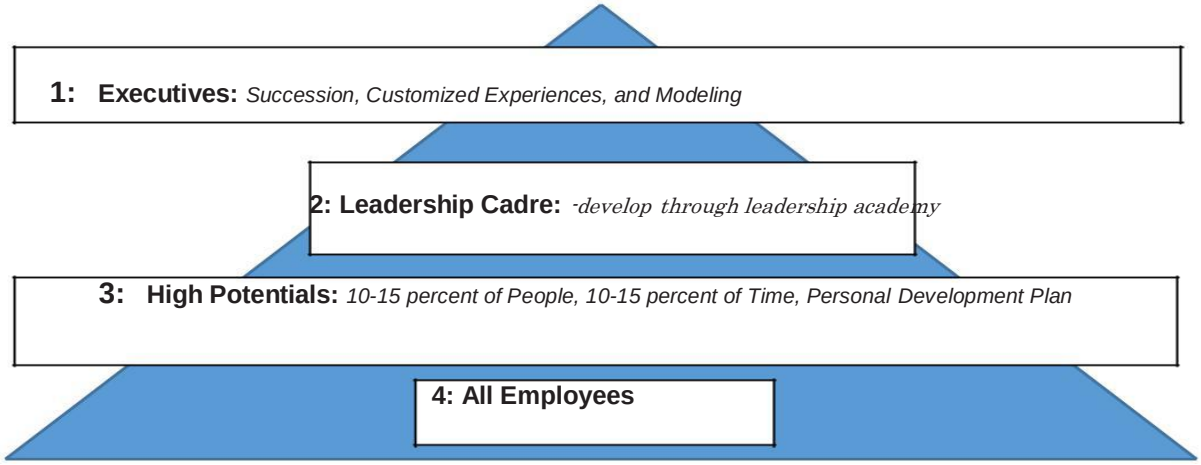

Figure 1: What is talent?
(Source: Ulrich and Smallwood 2011, p. 2.)

In this regard, *talent* implies that these workers are top performers, high potentials, senior managers and/or people suitable for critical roles in the organisation (Ulrich and Smallwood, 2011: 2). Generally speaking, the definition of talent management depends on the definition of

talent. We can define talent as high performance and potential of a selected number of people to move up the organization into senior leadership or managerial positions. For others, talent is an inclusive term which refers to all employees, because everybody has the potential to be a *talent*. Thus is becoming a non- hierarchical concept. The concept of segmentation is the most widely used talent concept for international companies. The way in which, the concept of *talent* is identified basically determines which talent management system a company uses. The next section examines the definitions of TM.

1.2. Versatile talent management

In organizational talent management, each company uses its own *talent* definition which depends on the industry, activity etc. In these corporate talent definitions there is always a dominant component that presents the theoretical framework for the models. Below, I describe the best known talent management models.

Talent management is defined in various ways. 'Talent management is the systematic attraction, identification, development, engagement/ retention and deployment of those individuals with high potential who are of particular value to an organization' (Davies and Davies, 2010: 419). The relevant literature describes talent management as a general way of thinking, which seeks to achieve the highest level of potential at all levels of the organization. (Lewis - Heckman, 2006; Thunnissen et al., 2013). Despite the difficulty of defining TM, there is no clear cut conceptualisation of TM, either.

According to a survey conducted by CIPD (2011) and McDonnell et al. (2010), talent management in organizations refers to the set of practices implemented to acquire, develop and manage employees in an integrated and strategic way. Talent management for successful companies is not just a HR job but part of the business strategy. Talent management consists of several subtasks. 'The two main tools of talent management are the acquisition of new talents and the retention of existing ones' (Daruka, 2012: 50). Talent management describes the systematic attraction, identification, development, engagement, retention and deployment of those individuals who are of particular value to an organisation, either in view of their 'high potential' for the future or because they are fulfilling business/operation-critical roles (Internet-1).

Based on my literature review, I have come to the conclusion that talent management (TM) has a lot of intersections with other management trends and disciplines. Within management trends, TM is closely related to human resources, careers and knowledge management. From the above theoretical approaches, I chose the Silzer-Dowell model (Silzer and Dowell, 2010) for the purposes of my research because it presents a complex model of the components of talent management. The model integrates business strategy, human resources strategy, talent management processes and organizational culture. My research was based on this model which is shown by Figure 2. Hereinafter I will test the elements of the model in Hungarian companies. These processes are not considered independent and isolated processes, but interconnected and related processes, in which case the output is the input. Processes are in accord with the most important values of the culture of the organization.

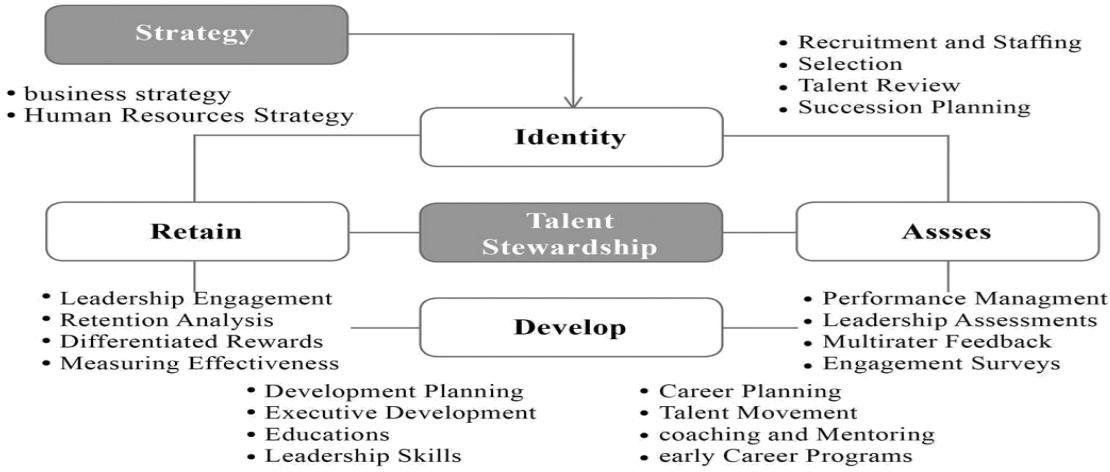

Figure 2: Model of Integrated Talent management
Source: Silzer and Dowell, 2010. p. 96.

1.3. Aim, objectives

The aim of the study is to evaluate the elements of talent management models, philosophies and the influencing factors of talent management in Hungarian companies.

The focus of this paper is to review the existing, relevant literature about the term of talent, and the main factors of talent management (TM). Then it explains TM by testing the selected model in Hungarian companies. The objective of the study is to understand and explain talent management as well as its related processes in the organization; that is why the talent management process was analyzed in the research. I formulated my hypotheses along organizational aspects based on the Integrated Talent Management Model.

1.4. Research questions and hypotheses

- Is company size an important factor in the talent management of the organization?
- Are larger companies more successful in retaining talented employees than small ones?

Furthermore, my research was also influenced by previous research on TM which focused on the organizational context of large multinational enterprises (MNEs).

My first hypothesis goes beyond previous research and deals with different company sizes. I formulated the following hypotheses:

Hypothesis No. 1: There is a statistically significant difference in talent management activities among the companies of different sizes.

Hypothesis No. 2: Small and medium-sized enterprises - due to their capabilities (size, sales, regionality, R & D spending etc), - follow different practice of talent management (TM) from large corporations.

Hypothesis (No.1, No.2) were tested based on data from empirical data collection. Descriptive statistics and ANOVA analysis revealed significant differences between company size and talent management elements.

The paper is structured as follows. First, I briefly review the TM literature. Then, I identify the different models of talent management (competency focus, talent pooling, talent investment and talenting orientation), and their influence on the value of the organization. The description of the methodology employed for my empirical investigation is as follows. Primary data were gained from quantitative questionnaire surveys in organizations. The survey was carried out in organizations of sectors in Hungary (n = 97). The research is part in the project with support of International Visegrad Fund No. 21220142 „Intergrated Talent Management”. This quantitative

research study was conducted between June 2013 and November 2015. Findings are presented and discussed in the Results section. The focus of the survey was the study of the different variables such as corporate size. The Discussion includes a summary and limitations of the study, practical implications and an agenda for future research.

2. Methods

The aim of research survey was to explore the implementation of the concept of talent management in the organizations in Hungary. A scaled questionnaire was compileed by a group of scientists collaborated in the Visegrad Fund No. 21220142 Project and it was used in papers of scientific journals (Egerová et al., 2013). It contained 41 items divided into five fields according to talent management process phases based on Silzer and Dowell-model like the implementation of talent management into business strategy *(formed by items 1–9)*, the identification of talents *(formed by items 10-20)*, the evaluation of talents (formed by i*tems 21-27)*, the development of talents (formed by i*tems 28-34)*, and retaining talents (formed by *items 35-41)*. Classification items like the size of the company, the proportion of administrative staff, the form of ownership, the economic situation of the company, foreign capital, field of activities, the position of the respondent and the company seat were also used in the research survey. In this paper, only one of the most interesting variables, i.e. the size of the company is analysed.

Marks	**Items**
I_1	Talent management is essential
I_2	Talent management is an important part of our company's mission
I_3	Top management has not worked out a joint attitude towards talent management
I_4	We have a clearly defined human resources management strategy
I_5	We have a clearly defined talent management strategy
I_6	Talent management strategy is connected with strategic goals of our organization
I_7	We are currently modifying the list of key talents indispensable in our company
I_8	We search for talent in every single person that has just been employed
I_9	Formulated talent management strategy is difficult to realize in our company
I_10	All positions in our company have been divided into key and peripheral positions
I_11	Our workers' competences are adapted to their position requirements
I_12	We are currently identifying talents among all the workers employed in our company
I_13	We are currently identifying positions we need to recruit candidates from the external environment
I_14	We apply a plan of attracting talents from the external environment
I_15	Our worker recruitment system makes it possible to acquire people of the highest development potential
I_16	We know very little about talents our employees have
I_17	Talented people are willing to get employed by our company.
I_18	We know what talents we are going to need in the future
I_19	We know how many talented people we are going to need in the future
I_20	We do not perform any special activities designed to attract talents
I_21	We systematically assess our workers' performance
I_22	We promote our workers on the basis of objective criteria
I_23	We do not draw conclusions from the workers' performance assessment
I_24	Talent management is linked to the workers' reward system
I_25	Talented people's assessment is performed on the basis of specially designed criteria
I_26	The results of workers' performance assessment are used to formulate talent development plan

I_27	We do not have clearly defined criteria of workers' performance assessment
I_28	We use a wide range of forms and methods of our workers' competences development.
I_29	In the recruitment process we do not take into consideration any above-average competences of potential workers
I_30	We have well-formulated career paths of talented workers
I_31	We develop talents due to the plans we implemented
I_32	In most cases the positions where our employees work do not make it possible to develop their talents
I_33	We do not have enough time to develop our workers' talents
I_34	We do have sufficient financial resources to support talent development
I_35	We successfully retain talented people
I_36	Talented people have financial requirements that we cannot meet
I_37	We do not have a clear system of motivating workers
I_38	We encounter problems as far as the communication with talented people is concerned
I_39	We manage to retain talented workers by supporting them in their self-improvement process
I_40	Talented people leave our company in search for new challenges
I_41	We do not support talented people in any special way

Table 1. List of the items and their marks

(Source: author's own processing)

The individual items of the questionnaire were scaled. Various kinds of rating scales have been developed to measure attitudes but the most widely used one is the Likert scale. The research group also applied this. Likert-scale is an ordered scale from which respondents choose one option that best aligns with their view like how much they agree or disagree with a particular statement (Dabi, 2015). There are two forms of 5 and 7-Likert-scale. We used the traditional 5-point rating scales. The five responses have a numerical value which would be used to measure the attitude under investigation, where 1 means absolute disagreement of the respondent, 5 means absolute consensus.

The questionnaire was distributed electronically in an online form of the Google documents system. Data analysis was performed by using SPSS software. In the SPSS Output Viewer, you will see the statistics and chart attached in the Appendix. Descriptive statistics and Anova-analysis were used for the evaluationand testing the hypotheses. There are many of them, the two most important groups are so-called measures of location tendency and the measures of spread. The location parameters give the value around which the elements of the sample are grouped like the average. While the spread parameters describe how close their values are to this point, descriptive statistics help describe and understand the features of a specific data set (Mitev-Sajtos, 2007). The influence of the selected characteristics according to the hypotheses was analized with Analysis of Variance (ANOVA) statistical methods, which is used to examine the effect of the independent variable on the dependent variable (Mitev-Sajtos, 2007). In the present case I will examine whether the size of the company affects the average value of the target variable or the characteristics of talent management.

3. Results

3.1.General information

The general variables were the size of the company, foreign capital in the enterprise, the type of ownership, and the type of basic activities. In the Hungarian research sample the following variables were used:

- Size of the organisation (number of employees): small: 28.9 %, medium: 29.9 %, large organizations: 41.2 %;
- Field of activity: Industry: 18.3 %; Construction: 11 %;

- Trade:15.1 %; Service: 65.6 %
- Ownership of the company: state-own: 18.6%; private: 81.4%

Foreign capital in the enterprises: 47.9% of searched enterprises dispose of foreign capital and 52.1% of enterprises have only Hungarian capital. The interpretation of the variables in the companies participating in the survey is the following. Small and medium companies are about 10% fewer in the sample. Large companies appear in the survey in the largest proportion. By the field of activity, we can see that the service sector is overrepresented. Concerning the structure of the companies, the majority are from the private sector. Typically, no firms with foreign capital were included in the sample. The share of administrative staff is typically up to 9%. Table 2 shows the mean and the standard deviation.

Item	**I_1**	**I_2**	**I_3**	**I_4**	**I_5**	**I_6**	**I_7**
Mean	3.77	3.55	3.02	3.39	2.93	3.13	2.98
St. Dev.	1.092	1.136	1.434	1.161	1.267	1.331	1.376
Item	**I_8**	**I_9**	**I_10**	**I_11**	**I_12**	**I_13**	**I_14**
Mean	3.48	3.52	3.11	3.49	3.17	3.28	3.00
St. Dev.	1.251	1.163	1.233	1.170	1.275	1.189	1.269
Item	**I_15**	**I_16**	**I_17**	**I_18**	**I_19**	**I_20**	**I_21**
Mean	3.36	3.44	3.35	3.48	3.01	3.18	3.66
St. Dev.	1.260	1.291	1.065	1.152	1.079	1.253	1.332
Item	**I_22**	**I_23**	**I_24**	**I_25**	**I_26**	**I_27**	**I_28**
Mean	3.32	3.63	3.03	3.14	3.34	3.61	3.03
St. Dev.	1.256	1.280	1.260	1.315	1.278	1.448	1.260
Item	**I_29**	**I_30**	**I_31**	**I_32**	**I_33**	**I_34**	**I_35**
Mean	3.51	2.89	2.99	3.28	3.34	2.90	3.20
St. Dev.	1.299	1.321	1.320	1.352	1.294	1.313	1.313
Item	**I_36**	**I_37**	**I_38**	**I_39**	**I_40**	**I_41**	
Mean	2.98	3.43	3.38	3.38	3.19	3.41	
St. Dev.	1.165	1.277	1.098	1.127	1.208	1.330	

Table 2. Descriptives statistics; Mean and St. Deviation
(Source: author's own processing)

The mean points out the respondents' average assessment. The meaning of the mean the scale from 1 to 5 can be described as follows. The avarege of scales is 3. The next items have been rated lower than the average evaluation: I_5, I_7, I_30, I_34, I_36. This shows that there is no well-defined strategic talent management in the companies participating in the survey. It does not mean that there is no talent management. It means that as an organization is becoming larger the overlapping of roles gives way to more specialized roles as the structure is evaluating and adopting a more functional form. The following items were rated above the average: I_1, I_2, I_9, I_21, I_23, I_27, I_29. The features of the registry is not functioning correctly, the wording of the deficiencies results in higher assessment. Problems received a higher rating.

Standard deviation indicates that the data more or less differ from the average. It shows around the average how data are scattered. By such sample sizes, the St. deviation value above 1 means that it is considerably scattered, so there are some whose opinions differ from the average. Scattering around 1 shows the items I_1, I_19, I_38. In these items, respondents formulated a more uniform, more pronounced response.

I have chosen the size of company as a variable for the purpose of my research as indicated in my hypothesis so I will show the influence of this variable below.

3.2.The influence of the examined variable

The simple correlation measures (ANOVA) examine the relationship between two variables. The significance level is a predefined value. If $p < 0.05$ then we accept H0 (no deviation in the mean of the categories). If $p > 0.05$, then H1 is accepted, it is a significant differences. The results of the tests are shown in Table 3.

Statistically significant differences exist in items 4, 40, 32. Item 35 shows a significance level sligthly below 0.1.

Item	**I_1**	**I_2**	**I_3**	**I_4**	**I_5**	**I_6**	**I_7**
p value	0.801	0.855	0.996	0.026	0.589	0.418	0.943
Item	**I_8**	**I_9**	**I_10**	**I_11**	**I_12**	**I_13**	**I_14**
p value	0.964	0.392	0.177	0.854	0.459	0.625	0.501
Item	**I_15**	**I_16**	**I_17**	**I_18**	**I_19**	**I_20**	**I_21**
p value	0.599	0.617	0.943	0.495	0.840	0.866	0.537
Item	**I_22**	**I_23**	**I_24**	**I_25**	**I_26**	**I_27**	**I_28**
p value	0.975	0.414	0.406	0.882	0.475	0.111	0.676
Item	**I_29**	**I_30**	**I_31**	**I_32**	**I_33**	**I_34**	**I_35**
p value	0.294	0.660	0.524	0.055	0.460	0.542	0.093
Item	**I_36**	**I_37**	**I_38**	**I_39**	**I_40**	**I_41**	
p value	0.298	0.831	0.533	0.810	0.013	0.566	

Table 3. Verification of the differences – size of the enterprise
(Source: author's own processing)

As you can see the most significant variable related to the size of the enterprise is item I_40, which means talented people leave the company in search for new challenges. This is linked to the following significant result which shows that in most of the cases the situations where our employees work do not make it possible to develop their talents. The clearly defined human resources management strategies determine the size of the company. And the successful retainment of talented people also depends on the size of the company but this effect is weak.

In the following part, I look at the items that showed a significant relationship with the company sizes variables. The results of the tests are visualised by Table 4.

Significant Items	Company size	N	Mean	Std. Deviation
We have a clearly defined human resources management strategy	Small	25	3.84	0.943
	Medium	29	3.66	1.203
	High	40	3.80	1.114
	Total	94	3.77	1.092
In most cases the positions where our employees work do not make it possible to develop their talents	Small	26	3.5	1.364
	Medium	25	3.12	1.269
	High	35	3.23	1.416
	Total	86	3.28	1.352
Talented people leave our company in search for new challenges	Small	27	3.44	1.34
	Medium	26	2.96	0.999
	High	37	3.16	1.236
	Total	90	3.19	1.208
We successfully retain talented people	Small	27	2.85	1.262
	Medium	28	2.84	1.325
	High	38	3.14	1.242
	Total	93	2.94	1.267

Table 4. Descriptives statistics of significant items
(Source: author's own processing)

The observed significant relationship between I_40 and company size shows a higher than average rating by small companies (3.44), which might be explained in this way: retaining talented employees in small companies is difficult, new challenges must be ensured for them. This correlation shows another significant rating highest at small companies (3.5). Which suggests that in most cases the positions where the employees work do not make it possible to develop their talents.

The best clearly defined human resources management strategy should be a feature of large companies (3.8). This result is not surprising because here it is possible to develop functional strategies in all key functional areas of the company, thereby it clearly outlines some of the key technical areas. The last evaluated variable shows that large companies are capable of retaining talented employees successfully. The large Hungarian companies mostly deal with the implementation of talent management practice. The employees in key position retaining and developing the talents works just in a well-structured, unified, but complex best for large corporations. In the majority of large companies in Hungary talent management plays a key role in HR strategy. The limited knowledge about talent management in SMEs indicates major challenges in attracting and retaining talent.

4. Discussion

This study sets out with the aim of assessing the importance of the size of the companies. This research involves 97 enterprises of Hungary. There were some interesting findings identified as the results of my research. My hypotheses were that the size of the companies is an important factor influencing the strategic approach to talent management.

Hypothesis No. 1 was partially justified. That means that there is statistically significant difference in talent management activities among the companies of different sizes but I examined relationships just by few items.

Hypothesis No. 2 was rejected. Small and medium-sized enterprises do not typically follow a different practice of talent management (TM) from large corporations. In just a few variables the differences were definitely justified. The full benefits of talent management can only be achieved if they are fully integrated, as we saw the fewest of these examples in the Hungarian sample. In general, companies do identify the value and importance of managing their talent, especially within today's economic environment. The SMEs are set up in a more informal way and concentrate more on informal high performance work practices than larger companies do. But it can be, that the smaller the company, the less evolved its HRM and talent management procedures are, they do not need formalised talent management procedures. Another research could also examine this.

A possible explanation for these results may be the low size of sample. The reason for this can be that the well-defined talent management programs are available only for large companies. The smaller the company, the less evolved its HRM and talent management procedures are.

There are some limitations of my research. First of all the low size of the sample. In further research I would test to investigate more respondents. I should also test in further research other possible research questions whether the companies' economic situation limit the opportunities to retain talented individuals. I would like to examine if the strategy of talent management is formulated on higher quality level (higher rating of items) than a more efficient practice of talent management would be implemented.

I close my paper with a quotation: „This is not the "talent management" or "integrated talent management" we have been talking about in the past. This is something more. We may call it "people management" or maybe even "creating a people environment." (Josh Bersin) Maybe the title of my next paper will be People management in Hungary.

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EXPANSION STRATEGIES ALONG THE SUPPLY CHAIN IN THE BAKERY INDUSTRY THROUGH CASE STUDIES

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Abstract:
Nowadays supply chain management has been playing a key role in almost every area from production to service. In the currently turbulent, changing and globalised competitive world the enterprises who are part of a well-structured, organised supply chain are the winners. That work in an efficient way such as a bakery shops. For small and medium sized enterprises, it is especially important to know how they can develop and grow and give more added value to their customers. The objective of the thesis is to determine the most important participants of the supply chain in the bakery industry and to examine the opportunities for expansion.
Only few works give a successful business model for bakeries. Therefore, I have designed research, which analyses the participants of a bakery supply chain and expansion strategies. The operation of bakery shops was understood through case studies.
My research findings highlight the specific participants of the bakery industry and encourage bakery shops to use different expansion strategies.
Keywords**:** supply chain, competitiveness, strategy, bakery industry, expansion, case study

1. Introduction

As an associate professor at the Department of Operations Management and Logistics and supervisor of Supply Chain Management subject I have examined the supply chains in different industries based on in-depth interviews and questionnaires for 3 years, focusing on the following areas:

- the role of logistics at the company,
- realisation of green logistics at the company,
- the company's position and role in the supply chain,
- relationships of the company with its suppliers and customers.

For 10 years I have examined the small and medium sized enterprises in 4 different industries: bakery, wine, handcrafted chocolate, wellness.
The research areas were as follows:

- the assessment of the entrepreneur and the enterprise,
- the exploration of the start of the business, and the life cycle phases,
- the assessment of the business operation and strategies,
- the examination of the place and role of the enterprise in the industry,
- the evaluation of the entrepreneurial decisions making,
- the determination of factors of success.

Based on my previous research, in my thesis I will focus on managing the supply chain in the bakery industry.

From year to year, worrying news are coming up about bakeries, as reported by HVG (Heti Világgazdaság - Weekly Economic Report):

- Baking companies are moving on a forced path. (HVG, February 2018)
- There is a lot of trouble at the bakeries. (HVG, September 2017)
- They would fight against Albanian bakeries using fancy trademarks. (HVG, August 2016)
- Other main news from the internet in connection with the problems in the Hungarian bakery industry are as follows.
- According to Magyar Hírlap (Hungarian News) bakeries have to raise their prices of bread by 30 percent in January. The bakery industry needs to increase wages to keep labour, almost three thousand skilled bakers are missing from the bakeries. (Vöő, 2016)
- To be or not to be, this is the question in the bakery industry. (Nemzeti Agrárgazdasági Kamara, 2016)

Nowadays, supply chains determine competition in the market. The companies and participants who can satisfy the customers' dynamically changing needs faster will be the winners. In our globalised world excellent product or service are not enough to win the competition. Therefore, we have to renew and rethink our business model from time to time.

Corporate competitiveness is influenced by a number of internal factors that can be changed by decision-makers, as well as many external influences from the environment (Figure 1.). One of the key areas of corporate competitiveness analysis is the assessment of internal capabilities. The aim of the analysis is to give a realistic picture of the company's operations and resources for the contractor who knows what kind of capabilities can be built in the future. Commonly used methods are estimates of operating in the environment (BCG matrix), stakeholder management, resources analysis, and abilities assessment. Although the external environment cannot be changed, our approach to the environment largely depends on the leader's own decision and preparedness. One part of the external factors influencing corporate competitiveness comes from the macro environment of the company (like political, economic, social, technological, environmental, legal).
PEST(EL) analysis is the most commonly used method for analysing these conditions and classifying the factors. The other part of the external factors influencing corporate competitiveness can be related to the company's micro-environment (business or market environment), which can be analysed by Porter's diamond model (Porter, 2006). In the last decade, supply chain investigation has appeared in the toolkit of microcirculation analysis. This method, similarly to the 5-factor Model, focuses on the players in the business, but from a different approach. The supply chain describes the players in the business and describes the relationship system as participants work together to produce a product, service (value for the end user) created for the end user. Using this method, it is possible to map out in the industry who contributes to the production of the final product, service, what kind of co-operation exits between the individual members, what forms of cooperation are successful, and who the major players are.
Figure 1. shows the main participant in the microenvironment, like the producer, the competitors, suppliers and distributors. Each industry has some own specific members focusing on the industry characteristics. It also demonstrates the elements of the macro environment like culture, economy, policy, society, demography, technology, law.

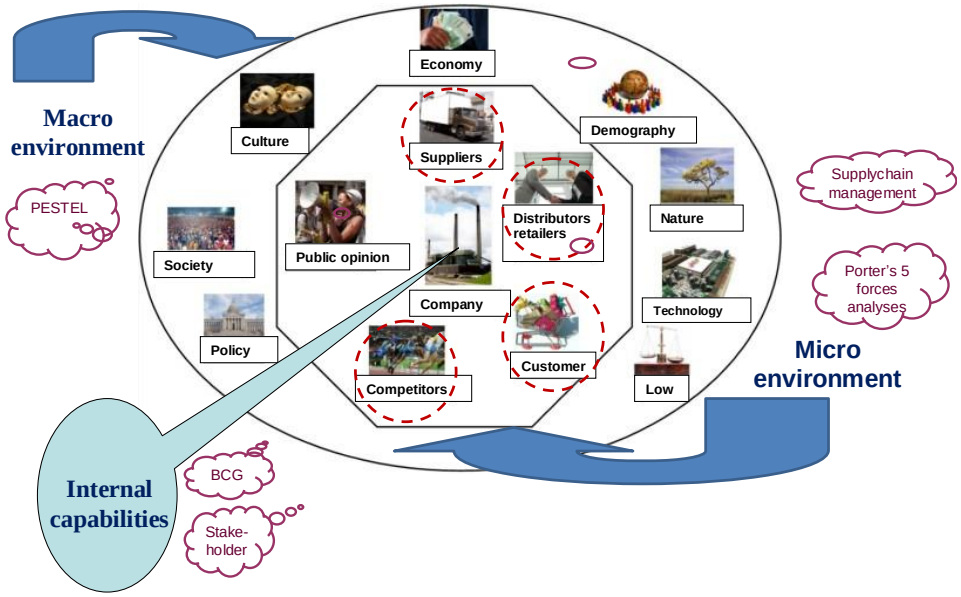

Figure 1. The components of company environment and the company
(*Source: author's own compilation*)

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 which 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 (see Table 1.):

- strategy is always in the top three,
- benchmarking holds the ranking,
- TQM is ranked further, and
- supply chain management has become the focus of thinking.

It is important to understand that not all tools are suitable for all situations and circumstances. The analysis also indicates that if the satisfaction with a tool is high but its efficiency is low, its application is expected to increase. In turn, if its utility is high but its satisfaction is low, its application is expected to decrease.

Practice shows that the most interesting and the most exciting games can be found in the companies' micro environment, namely, in the industrial supply chain. These strategic games can be found not only in big companies like in the car industry or the pharmaceutical industry but also among small and medium sized enterprises.

	2010	2012	2014
1.	Benchmarking	Strategic Planning	CRM
2.	Strategic Planning	CRM	Benchmarking
3.	Mission and Vision Statements	Employee Engagement Survey	Employee Engagement Survey
4.	CRM	Benchmarking	Strategic Planning
5.	Outsourcing	Balanced Scorecard	Outsourcing
6.	Balanced Scorecard	Core Competencies	Balanced Scorecard
7.	Change Management Programs	Outsourcing	Mission and Vision Statements
8.	Core Competencies	Change Management	**Supply Chain Management**
9.	Strategic Alliances	**Supply Chain Management**	Change Management
10.	Customer Segmentation	Mission and Vision Statements	Customer Segmentation

Table 1. Top 10 management tools
(Source: based on bain.com, 2015)

A recent study focuses on the bakery industry, which has a huge importance because, on the one hand, one quarter of the almost 5,000 companies in the food industry is bakery companies. On the other hand, twenty percent of the 90,000 employees in the food industry work in the bakery industry.
In Hungary, the average consumption per person is about 37 kilograms of bread and about 15 kilograms of bakery product per year.
The bakery industry encompasses a diverse range of products. Bakery products can be classified into two major categories:

- Bread: There are a variety of breads available in the market in different formats and versions: white bread, whole meal and brown bread, specialty bread/ artisan bread. Examples of specialty breads include French baguettes, Italian focaccia, Greek pita, Indian naan, American flatbread, and Irish soda bread. These breads can be wrapped, unwrapped, sliced or unsliced.
- Biscuits, cakes: rolls, muffins, crumpets, scones, teacakes, pancakes, croissants, bagels, cookies.

In recent times, the Hungarian bakery industry has undergone significant changes as it responds to shifting consumer trends, especially the growing preference for products providing health. Bread forms were the most innovative product, healthy bread variants such as natural, light or low-carb and organic breads, low/light, fat-free and sugar-free products were developed.

Over the last 5 years many bakeries were created. According to the Hungarian Central Statistical Office (KSH), 1100 companies deal with bakery products as their main activity but only 40 of them are big corporations while the number of medium-sized companies is 200 and the rest are mostly micro enterprises.

Nowadays bakeries are faced with more challenges and significant trends:

- There are plenty of entrepreneurs who set up a bakery without far prior expertise because they did not have any better idea.
- Competition between companies is further intensified by the setting up of Albanian bakeries with very simple production technology and very low-cost products. They do not comply with the provisions of the "Hungarian Food Book", so their costs and consequently their prices are lower than those of Hungarian businesses.
- Labor shortage is growing. There are 6,000 workers in the industry, which lack 3,000 workers. In addition, costs such as wages and logistics are growing steadily. On the other hand there is big shortage from the skilled entrants similar as in the case of other sectors (Czeglédi-Juhász, 2015).
- There is not enough money for development, for example, for automation. The lack of new technologies worsens cost-effectiveness, and the retails or the multinationals are not willing to pay extra costs.
- Growing popularity of healthy variants bakery products (like whole meal and premium breads) and fortified breads (seeds, Omega-3, prebiotics). More varieties of specialty breads made by the white bread manufacturers compete with the increasing popularity of whole grain breads.
- Growing demand for natural and fresh products. The healthy organic breads and specialty bread creations made by Artisan bakers are popular. Low sugar cakes are gaining popularity.
- Increasing number of in-store bakeries. There are a lot of baked goods in food service sector.
- Reducing popularity of home baking and growing availability of home freezers and microwaves and rising demand for commercially baked products creates the opportunity for baked goods prepared by the bakeries.

It must therefore be recognized that the key competitive factors include price, product quality, product differentiation, innovation, branding, and control over the quality of ingredients used, and technology, distribution network (own shops, franchise partners, internet) or service expansion (coffee shop, other products).

Considering these trends and the specific characteristic of the bakery industry, I am interested in the following *research questions*.

1. Who are the main members of the supply chain in the bakery industry?
2. What expansion strategies do companies adopt?

Concerning the research questions, two *hypotheses* were formulated:

1. There are specific members in the bakery industry focused on the industry features.
2. There are correlations between cooperation and the quality of a product.

This article will first address the participant of simple supply chain, and then consider the situation in bakery industry. After that this article will look at three of the main theories of

expansion strategies in detail. This article argue that the cooperation has an impact on quality of bakery product by giving examples of how.

2. Methods

To achieve the objectives of my research, first I studied and critically evaluated the national and foreign literature on the topic with a systematic approach.
I have chosen case study analyses as qualitative method in my primary research. The case study shows the process, not a static state or condition.

Yin (1984) suggested that three conditions could determine the type of research programme indicated

- the type of research question;
- the degree of investigator control possible;
- the degree of focus on contemporary events desired.

Table 1. provides an outline of the different types of research strategies (experiments, surveys, archival analyses, histories, case studies) in social sciences under each condition.

Research Strategy	**Form of research**	**Requires control over behavioural events?**	**Focuses on contemporary events?**
Experiment	how, why	yes	yes
Survey	who what, where, how many, how much	no	yes
Archival analysis	who what, where, how many, how much	no	yes/no
History	how, why	no	no
Case study	how, why	no	yes

Table 2. Relevant situations for different research strategies
(*Source: Yin, 2003:6*)

“One of the reasons for the recognition of case study as a research method is that researchers were becoming more concerned about the limitations of quantitative methods in providing holistic and in-depth explanations of the social and behavioural problems in question. Through case study methods, a researcher is able to go beyond the quantitative statistical results and understand the behavioural conditions through the actor’s perspective.” (Zainal, 2007:1)

Yin (2003:13) defines case study research method as an “empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and
context are not clearly evident”. It is preferable when 'how' and 'why' questions are asked.
According to Dul and Hak (2008:4) case study is “a study in which (a) one case (single case study) or a small number of cases (comparative case study) in their real life context are selected and (b) scores obtained from these cases are analysed in a qualitative manner”.

Case studies from various disciplines and domains are widely reported in the literature. Case studies are useful in research as

- researchers can examine data at the micro level,
- it can be a practical solution when a big sample population is difficult to obtain,
- they present data of real-life situations,
- they provide better insights into the detailed behaviours of the subjects of interest,
- as an exploratory tool,
- used for exploration and hypothesis generation.

As my primary research is based on case studies, I have been analysing the place and role of the Hungarian enterprises in their industrial supply chain in the bakery industry. My analyses cover the following areas: the company's relationships with customers and suppliers, expansion strategies along the supply chain, the success of business supply chain management.
My plan was to introduce, then analyse the case studies of two Hungarian bakeries, which are successful in business although the entrepreneurs have chosen different ways of expansion. When selecting bakeries, I tried to introduce a company that has many stores and whose products often meet with consumers. So I have chosen JóKenyér és Lipóti Pékség.

- The first one is JóKenyér company. The founder of "JóKenyér" was among the first to start producing rye, seeds and whole grains bread in Hungary. (Sőptei, 2017; jokenyer.hu, n.a.)
- The second one was Lipóti Pékség. The European Business Awards ranked the Lipóti Pékség as one of Europe's top ten businesses. Among the prizes of Entrepreneur of the Year, the "Example image" special prize was awarded to the owner of the Lipóti Pékség. They introduced traditional, large bakery products on the Hungarian market. The decisive step in their expansion was the opening of sample shops and later the development of a shop network in the franchise system. (SE, 2011a, 2010)

3. Results

This industry outlook examines the Hungarian bakery industry. This thesis is a detailed analysis of the supply chain.
To understand and analyse an industry, the operation of the industry we have to know

- who the main members of the industrial supply chain are;
- what games are played by the members to satisfy the needs of end users, what games are critical, and who can be the winners;
- what opportunities there are in the industry business by increasing the company's strengths; is it worthwhile to create a cooperation, which is other than the present one; or it would be advantageous to connect to other partners or cooperation chains;

As a results, at first the members of the bakery supply chain are determined, after that the expansion strategies based on successful operating Hungarian bakery enterprises along the supply chain.

3.1. Supply chain analysis

In this chapter I will determine the main members of the supply chain in general, after that I will examine the specific members in the bakery industry.

The linear supply chain (Figure 2.) shows only the main players in the process who are part of a supply chain network.

The basic group of participants creates a *simple supply chain***,** which is composed of a company and the suppliers and customers of that company. There are companies that are producers, distributors or wholesalers, retailers, customers, final consumers of a product. *Extended supply chains* contain three additional types of participants. Firstly, at the beginning is the supplier's supplier. Then there is the customer's customer at the end and finally there are service providers.

The members of the supply chain include

- Suppliers, who provide the raw material, the ingredients of the products and the additives, and the necessary equipment;
- Manufacturers, who produce the product;
- Wholesalers, Distributors, Retailers, who transmit the product from the manufacturer to the end customer. Distributors typically sell to other businesses and they sell products in larger quantities than an individual consumer would usually buy. Retailers sell in smaller quantities to the general public.
- Logistics providers, who help transfer the products;
- Customer, who has demand and consume the product.

In this process the customer is the only independent decision maker. The customer needs must be satisfying by the supply chain member, who works for higher profit, paid by the customer, and they are working to give the right product, at the right price, from the right store, in the right quantity, at the right time for the right customer (see Figure 2.).
To sum up, the manufactures need to understand the fact that in the present world of competition meeting consumer demands through innovation is the key to sustain and grow in the industry.

Companies of today can be successful only if they cooperate with others. This kind of management strategy helps in corporate competition and is required for long-term success (Figure 2.).

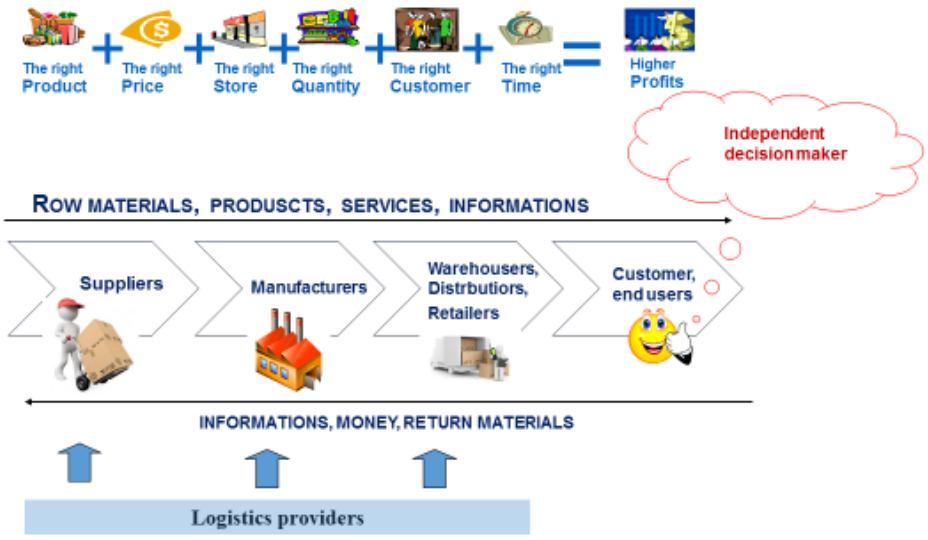

Figure 2. The members of the supply chain
(*Source: based on Kozma – Pónusz, 2016*)

There are different members in the different sectors depending on industry characteristics.

The *key participants* in the supply chain of the bakery industry include raw material supplier (ingredients), millers, ingredient manufacturers, premixers, bakers, bakery product distributors and end users. In addition, the industry structure also involves intermediary participants such as ingredient distributors, traders, transporting and packaging companies. (Figure 3.)
The next section gives a detailed review of the main participants.

The *basic raw material* used for the production contains wheat, rye, palm oil, aroma compounds, fruits and vegetables and starch derivatives (dextrose). (Tolnainé, n.a.) These raw materials are supplied by the farmers or producers of agricultural products to the manufacturers of these ingredients, additives or to bakery manufacturers.

The *millers* supply the flour to either the ingredient manufacturers or the bakery manufactures directly. The quality of any bakery product is influenced by the quality of the flour as raw material, therefore the miller has an important role in the added value creation. So we have to talk about them separately.

There are various ingredients used in making baked goods such as flour, emulsifier, flavours, colours, fats and sweeteners (Tolnainé, n.a.), made by *ingredients manufacturer*. Multi-Ingredient Suppliers provide the ingredient needs not only for bakeries but also for other industries. The Speciality Bakery Ingredient Suppliers are companies whose major chunk of the turnover comes from the ingredients supplied to the bakery market. Most of the main players in the ingredient manufacturing market place prefer to integrate vertically and deal with the farmers directly to procure the necessary raw material.

The *machine manufacturers* provide the equipment, like oven, or blender. Technology and innovation can drastically change the baking industry.

One part of *bakery manufacturers* is primarily involved in manufacturing fresh and frozen bread and other fresh bakery products. These bakeries buy the bakery ingredients from the ingredient manufacturers. They mostly procure the flour from the millers directly. They sell their products through supermarkets, food service, convenience stores, small retail outlets, and speciality stores. Some of these bakeries also produce their own branded products in addition to private label brands of the retailers. These retail bakeries can manufacture and wholesale their products. Other part of bakeries is primarily engaged in the retail sale of bakery products. They either purchase the baked goods from the bakeries or manufacture themselves on the premises. They prefer part-baked or frozen dough products. These commercial bakeries usually have extensive distribution networks; they do not directly sell to the final consumers.

According to Werli (2011) the most significant change in the bakery industry over the past period has been the explosion of frozen technology. The traditional bakeries first regarded frozen technology as most competing when they came to the smallest shops with simple ovens, where they baked frozen pastries that were offered hot and scented. The essence of frozen technology is that from a commercial point of view bakery products that have been produced extremely efficiently in a central plant can be ready after freezing, just before sale. With this solution, a small shop can keep up-to-date fresh goods in a wide range.
So the production process had to be separated into two different parts, because first the pasta should be done: some bakery freezes that (for example: PrímaPék) and the discharge is done by the trader, or retail outlets; with others the baked, final product are sold by the distributor to the customer.

There are a lot of *channels* through which the baked products reach the end consumers like supermarkets, retail outlets, shops, stores, food services (Figure 3.).

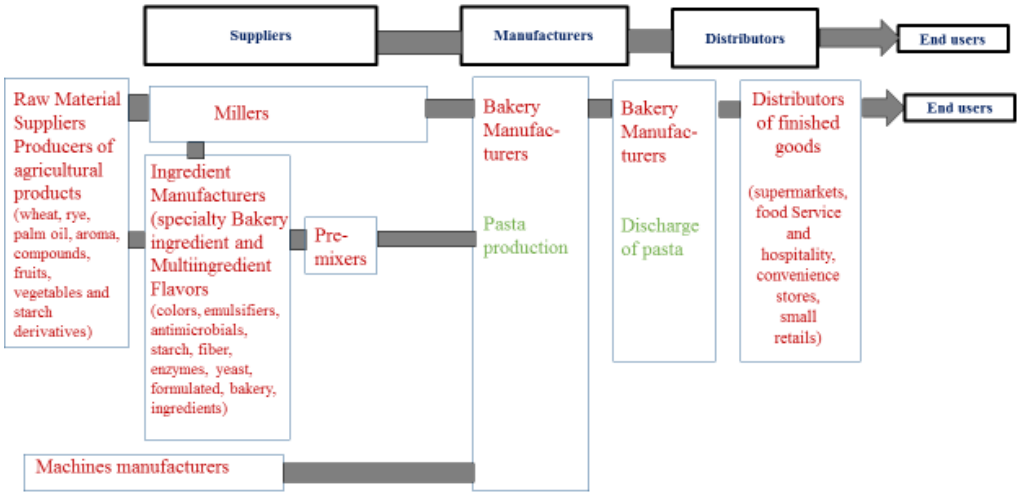

Figure 3. The supply chain of the bakery industry
(*Source: author's own compilation*)

Competition among the key players in the industry is usually based on price, quality, differentiation, and nutritional value.

3.2.Expansion strategies

In this chapter I will examine the expansion strategies of bakeries along the supply chain, based on the case studies.

Enterprises that want to grow or expand have the common goal of making their positions more favorable. In addition, their common goal is to gain more share of the value produced by the industry.

I mentioned in the Introduction that the most important 'games' are in the industrial supply chain. The expansion strategies show the action or plan that can be implemented in the industry supply chain. These expansion strategies, called "External expansion strategies", are those where operations are mainly outside the company's boundary.

Three types can be distinguished from the direction of expansion (Figure 4.) (Szegedi − Prezenszki, 2003; Salamonné, 2010):

- Horizontal expansion, when an enterprise is trying to reach a larger market share within its own chain, tier. This can be the case if a manufacturer tries to increase the share of the manufacturers tier. Manufacturers deal with manufacturers, retailers deal with retailers, or merge with some members of the tier.
- Vertical Expansion, when the company enters the supply chain's other tier. A certain enterprise is trying to gain a share of other members' interests. This can be the case if the manufacturer attempts to obtain a share in the tier of suppliers or traders, or start to create a sample shops network. It belongs to this type if certain members are excluded from a process, a supply chain. The most common feature is that manufacturers or providers sell directly to the end users (for example, on the Internet). By doing this, they can gain competitive advantage over others and have more information about their products' end-users.

- Diagonal Expansion, when firms diversify into new business areas. An enterprise gains its share in a new product or service market in relation to its current business scope. The goal of the diagonal strategy is also to grow an enterprise, which is the realization of a new area (industry or business).

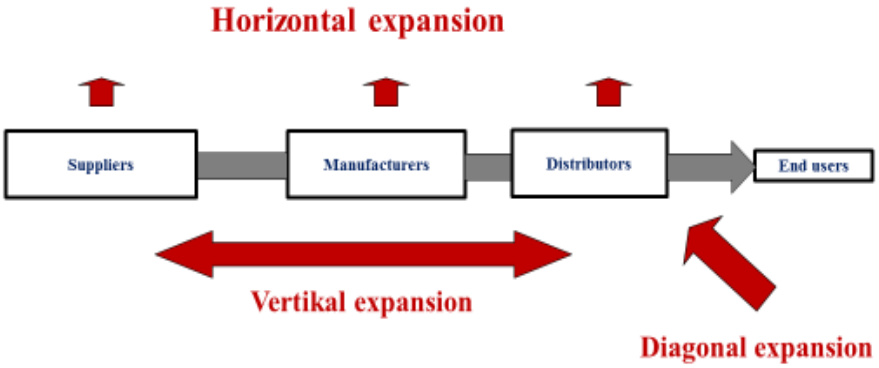

Figure 4. Expansion strategies of businesses along the supply chain
(*Source: author's own compilation based on the theoretical models*)

Now let us see which expansion strategy has been chosen by the two Hungarian bakery companies.

3.2.1.Business model of JóKenyér

JóKenyér company was established by a Hungarian baker, Ludwig Klára in the early 1990s. She gained professional experience in Germany. At first 10-15 breads per day were baked in the factory of 100 m^2 primarily for the locals and foreigners, who missed the German bread culture. At that time, seedy bread, rye bread was completely unknown in Hungary. The Jókenyér brand was created in 2005. Due to development and investment, the factory of approximately 3500 m^2 is well equipped, unique in Hungary, meets European standards. The production process is also precise. Cleanliness and hygiene are important; the bakery meets the international requirement of International Food Standards (IFS). (Megyeri, 2010; Söptei, 2017; elelmiszer online, 2011, 2017; SE. 2011b)

The values (element of success) of the bakery include:

- traditional recipes,
- excellent ingredients, more natural raw materials,
- healthy nutrition,
- high quality,
- accessibility to every end user,
- a wide range of products (approx. 100 different),
- no additives and artificial colours,
- good production technology,
- and finally, the diligence and the professional knowledge of the owner.

Expansion

The work is being done in the factory day and night.

As a bakery manufacture, they produce the pasta, ready doughs are processed by hand, after that the dough is rested and then they bake it in their own bakery, or the chilled (but not frozened) dough is baked in the own shops.

The fresh bakery products, prepared in the bakery, are delivered to their own shops at night baked it in local furnaces. The packaged breads are coming to the grocery store even at night, and in the morning they are lining up on the shelves. So customers receive fresh goods every day.
The final product is sold not only in their own shops, but also in big stores like CBA group and for domestic hotels also.
The bread and pastry left over from the evening are handed over from their own shops to charity organizations, which are mainly used for children's establishments.
According their opinion, the quality of the final product is influenced by the quality of the flour, so they entered one step backward and bought a small miller. The fresh, whole wheat flour is milled every day.
It is also important for the owner to preserve the environment. Therefore, the heat generated during the baking process is further exploited from which it is heated and thus heated by water. (Söptei, 2017; Werli – Oláh, 2009)
Figure 5. clearly shows that in the supply chain the company is in the following stages: as a raw material supplier by the flour grinding, manufacturer and distributor and the expansion is along the chain.

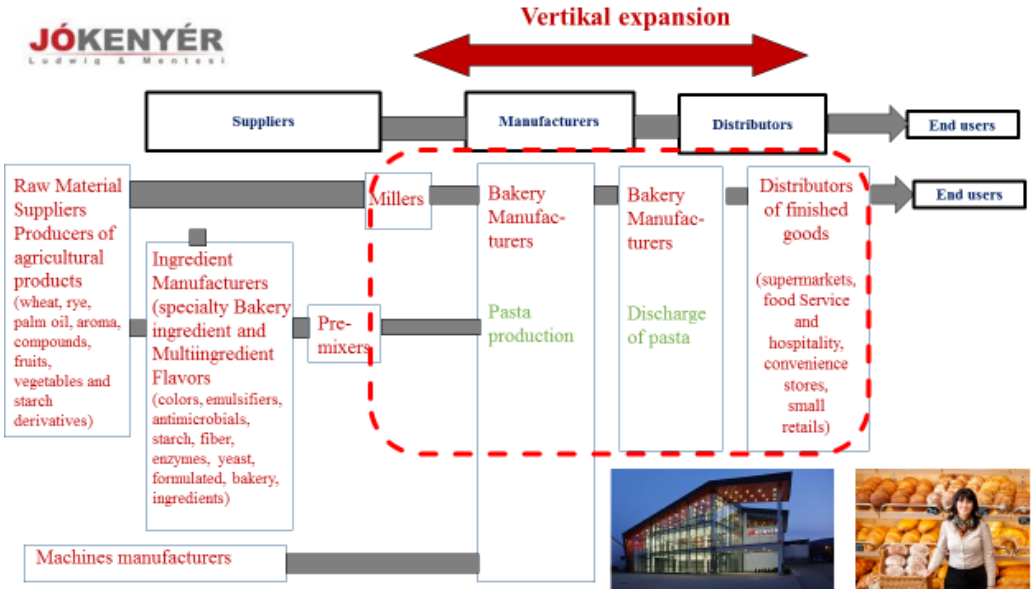

Figure 5. Vertical expansion
(*Source: author's own compilation*)

3.2.2.Business model of Lipóti Pékség
The company was established by Tóth József Péter in the town of Lipót in the early 1990s. As a meat and foodstuffs seller but a real entrepreneur, he planned to open a sight bakery. But a Hungarian businessman living in Oslo advised to open a bakery. The Lipót Bakery started with secondhand bakery machines from Oslo. Initially, they produced for only the settlements around Lipót, then in 2006 the construction of the national sample network started. (Sebők, 2013; lipotipekseg.hu - 1, n.a.)
The values (element of success) of the bakery include

- everything for the customer;
- traditional, manual manufacturing technology;
- traditional recipes;
- quality management system based on customers' satisfaction of customers evaluation;

- without additives and preservatives;
- stores based on trust and cooperation;
- thoughtful expansion, expansion through franchise partners.

Expansion
They were one of the hypermarket suppliers but they could not keep too low prices. Further price reductions would have been to the detriment of quality. They were forced to make a choice and decided that their bread was good, delicious enough to start their own shop network in 2004.
Throughout the years, Lipóti has launched new production facilities in different part of Hungary, together in hands with the business groups Gyermelyi and Univer. As a result of the cooperation between Lipóti Pékség and Univer Coop Zrt., "Lipót Corner" in some of the Univer Coop Zrt. shops was set up, in which Univer bakery products Lipót products can be bought by customers. (Univer.hu, 2010)

Nowadays Lipóti has six factories. (lipotipekseg.hu -2, n.a.)

- The original one in Lipót has been producing the complete range of Lipóti products continuously since 1992.
- Tatabánya Baking Company produces the whole range of Lipóti products. The deep-frozen products are made here as well, which enables the bakery to satisfy those customers who enter their shops looking for freshly baked, warm products.
- The Veszprém production facility is a small-scale bakery producing white bread, Lipóti Parasztkenyér (cottage loaf) and smaller bakery products.
- The Budapest Lipóti factory only produces the company's flagship product, the 3kg Parasztkenyér (cottage loaf). The factory's main responsibility is to supply the Lipóti shops in the capital.
- The Szomor production facility currently supplies a part of the Lipóti shops in the capital.
- The Kecskemét bread factory establishment produces the whole range of Lipóti products.

In the sample shops they only sell fresh baked pastries so before closing time, the bakery goods that they did not sell are given to big families or children's hospitals.
A dairy farm was founded in 2016, so the company started to expand diagonally, as well (index.hu, 2016).
Figure 6. clearly shows that the company is represented in the stages of the supply chain: as manufacturer and distributor, and expands in the manufacturers' stage.

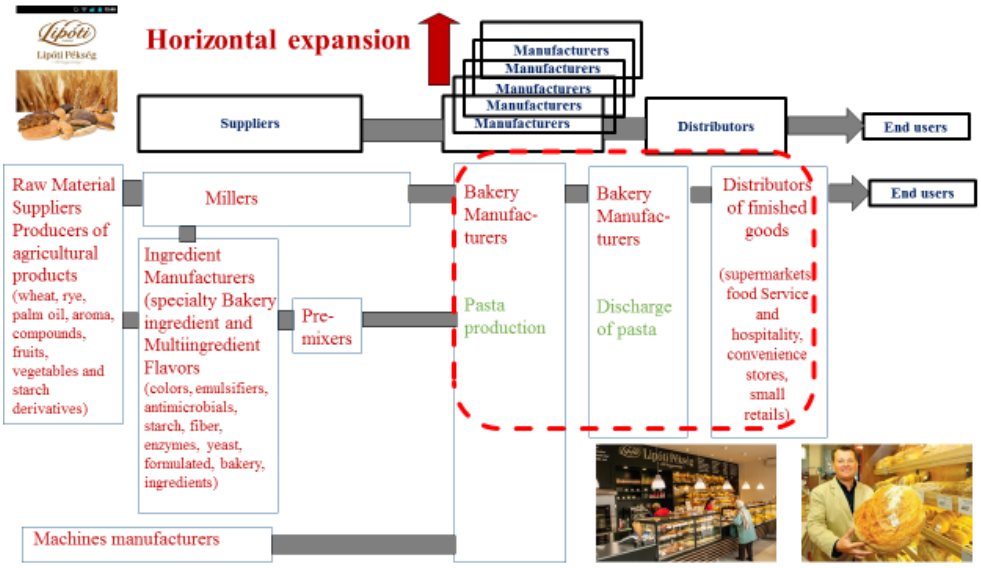

Figure 6. Horizontal expansion
(**Source: author's own compilation**)

4. Discussion

This study sets out with the aim of assessing the importance of managing supply chain in the bakery industry. As mentioned in the literature review, the companies which are a member of a well operating supply chain, or build an effective supply chain are the winners. Nowadays bakeries face a lot of challenges.
As a conclusion we can state that

- Bakery manufacturers need to be innovative in order to grow in the industry.
- The competition is big in the sector and is on the rise. The key competitive factors include price, product quality, product differentiation, innovation, branding, and technology.
- The emerging trend towards new product development and healthy variants has provided significant opportunities to ingredient manufacturers.

The first question in this study sought was to determine the specific members in the bakery industry. The production of any product or service usually involves several stages that are technically separable so we can distinguish different members along the supply process. Due to the new innovation of frozen technology, the manufacturing process has to be separated into 2 different parts: pasta making and baking.

The current study found that the key participants in the supply chain of the bakery industry are as follows: raw material supplier (ingredients), miller, ingredient manufacturers, premixers, ingredient distributors, bakers, packaging companies, bakery products distributors and traders and end users.

The second question in this research was to explore the expansion strategies in the bakery industry through case studies. As mentioned in the literature review, companies can grow vertically along the supply chain, or horizontally in the chain, or diagonally to enter into a new business. The concept behind the vertical supply chain is that the activities of an industry are in a sequenced: the sequence starts the early stages of the production process, then works its way

through the succeeding stages where the product is processed and refined, and finishes up as it is supplied or sold to the customer and end user.

The results of this study show that the strategy of the examined companies is similar, however, the direction of expansion is different. Both of them produce high quality products, operate with high added value and use unique raw materials.

These results can be useful for other bakeries which are looking for development opportunities or are on the way to expand. However, more research on this topic needs to be undertaken. It is recommended to do more case studies and a questionnaire surveys.

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THE USAGE OF ABBREVIATIONS, ACRONYMS AND INITIALS IN PEDAGOGICAL AND SCIENTIFIC ARTICLES

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Abstract
This paper is about the importance of abbreviations, acronyms and initials which are actually very challenging. The study examines the comprehension of abbreviations, acronyms and initials in pedagogical and scientific articles. Previous works have failed to address the comprehension of abbreviations, acronyms and initials. Therefore I have designed unique research to investigate the comprehension of them in scientific and pedagogical articles. Two academic papers were randomly chosen and document analysis were carried out. Additionally, reading comprehension tests were designed and tested among students whose language of instruction is English. Some of my hypotheses were rejected because abbreviations, acronyms and initials are more challenging to understand. One message of my research is that sometimes acronyms are difficult to understand therefore we should not overuse them in writing.
Keywords: abbreviation, acronym, initial, reading comprehension

1. Introduction

I first came across this topic when I was trying to find an English name and abbreviation for a non-governmental organization (NGO) organized by me. The name of this organization was 'Galgamenti Népfőiskola' in Hungarian. I myself created its English equivalent, which was the following: the Folk High School of the Region of the River Galga, whose acronym or initial is FRRG.

On one hand the usage of acronyms, abbreviations, and initials are functional and simple, but on the other hand, they might be challenging (Veresné Valentinyi, 2017, Veresné Valentinyi, 2015). Functionality means that acronyms are easy to use and understand for researchers, scientific authors, teachers, students because, they have been used in the scientific and also in the pedagogical language for a long time. Thus they have become widespread and easily recognizable. On the other hand, they are functional because the majority of scientific publications use a great number of acronyms, mostly English ones. So they have very close connection with English for Special Purposes (ESP). Also, acronyms are simple because researchers can create their own acronyms from a long expression only by picking the initial letters of the term and creating an acronym.
Having said that, the question of what makes the usage of these terms challenging arises. If the acronyms (and their meaning) are unknown, they may cause confusion and complication to understand the whole text. It is true that, most of the acronyms can be looked up on the websites for example abbreviation.com, acronymfinde.com, acronymslist.com but not all the acronyms are included among the items of these dictionaries. Also, they may pose challenges for the users because their usage and creation are not consequent in the different professional areas. For example, users are hesitant whether they should capitalize acronyms such as AIDS (Acquired

Immune Deficiency Syndrome) or they should mix capital letters with small ones e.g.: BSc, PhD or MTchgLn (Master of Teaching and Learning).

1.1 Definition

In linguistics, the definition of the term mnemonics summarizes the main features of the above mentioned abbreviations, acronyms and initials. According to the Cambridge Dictionary (2018) mnemonic is a very short poem or a special word used to help a person remember something. ’The musical notes on the lines go EGBDF - use the mnemonic "Every good boy deserves fun"’(internet-1)

The following sections define the acronyms, abbreviations and initials.

1.1.1 Abbreviations

Shorten form of a word or phrase, which becomes so familiar that the user is not aware of the original form for example ‘bus’ instead of ‘omnibus’, ‘TV’ instead of ‘television’. (Bailey, 2011). For example in academic writing we can meet ‘et al’ which stands for ‘et alia’. Measurement units are also abbreviations. (internet-2). See the usage of abbreviations in Section 1.2.1

1.1.2 Acronyms

Why acronym is called as it is? It comes from the compiling of the Greek words ‘acro’ (extreme, tip) and ‘onyma’ (name) (internet-3). According to the Cambridge Dictionary (2018) the acronym is defined as an abbreviation of the first letters of the word. It is pronounced as a word and written with capital letters. But Hume-Pratuch (2015) says that ‘since the mid-20th century, acronyms have generally formed pronounceable words; however, the rage for acronyms has outstripped the bounds of pronunciation, and this is no longer a requirement.’(Hume – Pratuch, 2015: 1)

1.1.3 Initials

Abbreviations that are constructed from the first letters of a long expression are referred to as initials. Bailey (2011: 175) emphasizes that they are read as individual letters. They include countries, organizations and companies. CNN (Cable News Network), IBM (International Business Machines Corporation) are initials. It is interesting to note, that the latter initial is classified as an orphan initial (or acronym according to Hume – Pratuch, 2015: 1), because the corporation has seen substantial restruction as a result the name of the corporation has changed, but its initial remained the same. (Hume – Pratuch, 2015: 1) Sometimes acronyms are mixed up with initials (internet 4). For example WHO (World Health Organization) looks like an acronym, but because we pronounce by letter, not as a word, it is an initial.

Furthermore, a question arises about spelling, which makes the usage of acronyms challenging. Why do they insert capital letters and/or small letters inside acronyms? Just to differentiate them from other similar ones? Or do they show that is inside the word? For example there is PhD which stands for Doctor of Philosophy, or BSc which stands for Bachelor of Science. Also I found this acronym in a pedagogical article: Master of Teaching and Learning Programme – abbreviated MTchgLn. Why not MTL or MTLP? Is there a kind of freedom of the author? I wanted to find answer to my question on a blog for Academic Coaching and Writing which works with Academic Psychological Association (APA) Style. Jeff Hume - Pratuch answered via email:

> ‘When it comes to abbreviations of academic degrees, the abbreviation is usually either a long-established custom (in the case of PhD) or is standardized by the group that creates or accredits the degree program. There is no rule in APA Style (or anywhere else, as far as

I know) that covers the creation of such acronyms, and usage may vary from one university to another. For example, Durham University, in the UK, uses MTL for Master of Teaching and Learning (internet-5) while the University of Waikato in New Zealand uses MTchgLn (internet-6).' (Hume-Pratuch, 2018)

I might conclude that there is a kind of freedom of the author or institutions to create acronyms with capital or small letters.

We might summarize that the abbreviation is a shortened form of a word or a phrase, the acronym is an abbreviation that may form a word but not necessarily, and initial is an abbreviation that uses the first letter of the word in the long expression. The following table summarizes the different definitions, spelling, and pronunciation of these mnemonics. See Table 1.

Name of mnemonics	**Definition**	**Spelling**	**Pronunciation**	**Examples**
abbreviations	shortening of longer words	lowercase	letter by letters	n = number of the people et al. = et alias (and other authors) cfu/m3 = colony forming unit per cubic meter per cent[1]= per centum= one to 100
acronyms	getting new term with the initial letters	capital letters, lowercase may also included	may pronounced as a word	COBOL = Common Business Oriented Language RADAR = Radio detecting and ranging MTchgLn = Master of Teaching and Learning Programme
initials	initial letters	term is created by either lowercase or capital letters	pronounced letter by letter	WHO (World Health Organization

Table 1. Conclusion of mnemonics, definition, spelling, pronunciation and examples

Source: the author's own edition via Cambridge Dictionary (2018)

1.2 Usage

1.2.1 The usage of abbreviations

Bailey (2011) noted that 'abbreviations are an important and expanding feature of contemporary English, widely used for convenience and space-saving.' (Bailey, 2011:176.) According to Hume-Pratuch (2015:1), the aim of using abbreviations is to maximize clarity, and saving space is not a sufficient reason to abbreviate. We should help the reader to comprehend our view, he says. Also, he mentions abbreviating long or complex, often used terms can speed reading comprehension. However, the multitude of unfamiliar abbreviations can reduce the clarity of our paper. He advises to limit the use of abbreviations to cases in which they are familiar and save space and time. (Hume-Pratuch, 2015:1)

1.2.2 The usage of acronyms

We have to take into consideration whether a special acronym is known and familiar, or it is not? Whether the use of the acronym has an advantage or not? For example, AIDS stands for 'Acquired Immune Deficiency Syndrome'. The Hungarian long term for AIDS is 'szerzett immunhiányos betegség' whose acronym should be SZIB. There are advantages of using the English acronym AIDS instead of the Hungarian acronym SZIB, especially when the term is known internationally, consequently we all understand its meaning. According to Papp (2004) three groups of acronyms are used in translation. The first group includes acronyms which are translated, i.e. localized, for example instead of United Nations Organization we use ENSZ – Egyesült Nemzetek Szervezete). The second group includes acronyms which are used in their origin English versions (NATO –The North Atlantic Treaty Organization, AIDS). The third group includes acronyms which are mixture of the first and the second groups e.g. we write USA -United States of America but we say Amerikai Egyesült Államok. (Papp, 2004: 82-83). If we feel puzzled about the meaning of acronyms, we can look them up in technical dictionaries or in online databases.

1.3 Research questions and hypotheses

According to what has been said above, abbreviations are functional, simple but rather challenging, and there are quite a few of them in pedagogical and scientific literature and in ESP. My research questions (RQ) are the following.

RQ1: Are abbreviations, acronyms, initials functional, simple or rather challenging? Does it depend on disciplines?

RQ2: What is the rate of abbreviations, acronyms and initials compared to the full term?

RQ3: Are students able to recognize the full terms of abbreviations, acronyms and initials?

RQ4: Are abbreviations, acronyms, initials easy to understand for students?

RQ5: Are there any differences between the rates of abbreviations, acronyms and initials in pedagogical and scientific texts?

My hypotheses (H) are the following.

H1. I assume that small per cent of the abbreviations will be challenging for students.

H2. I assume that the rate of abbreviations, acronyms, initials are higher compared to full terms.

H3. I assume that this rate depends on disciplines.

H4. I assume that students, whose language of instruction is English, will understand the abbreviations, acronyms and initials in context quite well regardless of which faculty (FESSc - Group1) or FAESc - Group2) they are studying on.

My paper is divided into four main chapters (IMRD). The introduction describes the background of my research article and the aims of my research. In the section Method I will write about the sampling and methodological tools in the investigation. The results will be the third section. Conclusions will be drawn from the results of the research in the Discussion section.

My expectations from the research are as follows. Only a few abbreviations, acronyms and initials are challenging for students, the majority of them will be simple and functional and easy to understand regardless of which faculty they are attended. I expect that the rate of abbreviations compared to the full term depends on disciplines. Furthermore, the pedagogical article uses fewer abbreviations, acronyms and initials than the scientific paper. I expect that the foreign students will perform better on reading comprehension whose comprehension tests were designed with full of acronyms.

2. Method

The aim of my research was to investigate the usage of abbreviations, acronyms and initials in written texts and also in comprehension tests. In theory the usage of abbreviations and acronyms seems simple and functional but sometimes rather challenging.
I investigated the rate of abbreviations compared to full terms in a pedagogical and a scientific article. I was curious about the differences in their numbers and rates in different disciplines.
I have chosen two different texts randomly from an academic journal published on the internet. (internet-7: Journal of International Scientific Publications - www.scientific-publications.net)
The first text is a pedagogical article (Sexton 2015), the second text is a scientific article (Golofit et al., 2017). These two articles are considered as genuine representatives of their disciplines.

2.1 Document analysis

I read the articles through carefully. I found full terms of disciplines and the abbreviations, acronyms and initials, and I counted the main terms both in long form and shortened form. I compared the rate of abbreviations, acronyms and initials to full terms between two different articles. Results will be detailed in the next sections. (3.1, 3.2, 3.3.)

2.2 Reading comprehension tests

I made a shortened version from each article and I compiled a comprehension test to investigate students reading comprehension. English speaking students, whose language of instruction was English, were asked to fill in the test. Two different groups of the students were involved in the research:
1., Group 1: students from the Faculty of Economics and Social Sciences (FESSc), whose number was 18.
2., Group 2: students from the Faculty of Agricultural and Environmental Sciences (FAESc), whose number was 9.
Group 1 got a shortened version of pedagogical article, which is in close connection with their profession. They had to complete a reading comprehension test about the text. There were two tests for Group1, which was divided into A and B subgroups.
In Test 1A long form of the term was given. 10 participants received it. In Test 1B acronyms were given. 8 participants received it.
Group 2 got a shortened version of scientific article which is in close connection with their profession. They had to complete a reading comprehension test about the text. There were two tests for Group 2, which was divided into A and B subgroups.

In Test 2A long form of the term was given. 4 participants got it. In Test 2B acronyms were given. 5 participants got it.
It is worth mentioning that due to the low number of participants in the sample, the research cannot be considered representative.

Each reading comprehension test consisted of 3 tasks and has the same design.
Subgroups A - First task (Task1) was a close task. It gave a task to find the acronym of the long terms. Second task (Task2) was an open task. It specified the acronyms which: 1., were difficult for students 2., were wrong. Third task (Task3) was a true or false statement, but the sentences included the long form of the terms. I measured the number of the right and appropriate answers and the mistakes they found.

Subgroups B - First task (Task1) was a close task. It gave a task to find the long term of acronyms. Second task (Task2) was an open task. It specified the acronyms which: 1., were difficult for students 2., were wrong. Third task (Task3) was a true or false statement, but the sentences included the acronyms of the terms. I measured the number of the right and appropriate answers and the mistakes they found.

3. Results

Two academic papers (pedagogical and scientific) were randomly chosen and the proportion of abbreviations - compared to full terms - was investigated. I found differences in numbers and rates in the texts of the different disciplines.

3.1. The document analysis of a pedagogical article
The above mentioned pedagogical article (Sexton, 2015) had the following terms and abbreviations, acronyms and initials. The numbers in the brackets indicate how many times I found them in the whole texts. I counted only the main specific ones. See Table 2.

	Full terms (number of their usage in the full text)	**Abbreviations, acronyms, initials (number of their usage in the full text)**
Pedagogy	Initial Teacher Education (4)	ITE (16)
	Master of Teaching and Learning Programme (2)	MTchgLn (11)
	Teachers' Sense of Efficacy Scale (5)	TES (8)
	Concerns About Teaching (7)	CAT (8)
	no given long form	EDUC
Statistics	number of the people	n
	percentage	%
	alpha Cronbach	α
	Statistical Package for the Social Sciences	SPSS
	standard deviation	SD
	first occasion of the investigation, second occasion of the investigation	T1 T2
Others	page 214	p. 214
	abbreviated days / abbreviated months	Mon Fri / Jul Aug
	more than 2 authors, et alia	et al
	Initials as monograms in the list of Sources	e.g.: ANTIKAINEN, A.
Total	**15 types**	

Table 2. Data about the abbreviations, acronyms, initials of a pedagogical text /Source: author's own editing

As we can see in the Table 2, interestingly, the usage of ITE and MTchgLn is 4-5 times more frequent in abbreviated forms than in full terms. But the other pedagogical terms such as CAT and TES and their full forms were equally used.

Two problematic terms were identified among acronyms, causing hesitancy. The first one is TES. The author used a special testing method called 'Teachers' Sense of Efficacy Scale' and he abbreviated it as TES, not as TSES as the pedagogical literature uses it for example in this article (internet-8). The second problematic long term is 'Master of Teaching and Learning Programme' which is abbreviated as MTchgLn. I asked an expert about the appropriate usage of MTchgLn or MTL on a blog for Academic Coaching and Writing which works with Academic Psychological Association (APA) Style. Jeff Hume - Pratuch answered via email:

> 'There is no rule in APA Style (or anywhere else, as far as I know) that covers the creation of such acronyms, and usage may vary from one university to another. For example, Durham University, in the UK, uses MTL for Master of Teaching and Learning (internet-5) while the University of Waikato in New Zealand uses MTchgLn (internet-6).' (Hume-Pratuch, 2018)

I might conclude that there is a kind of freedom of authors or institutions to create acronyms or initials with capital or small letters, so MTchgLn is not a mistake but may cause hesitancy among students.

3.2. The document analysis of the scientific article

The above mentioned scientific article (Golofit et al., 2017) had the following terms and abbreviations, acronyms and initials. The numbers in the brackets indicate how many times I found them in the whole texts. I counted only the most specific ones. See Table 3.

	Full terms (number of their usage in the full text)	**Abbreviations, acronyms, initials (number of their usage in the full text)**
Science	Automobile air-conditioning (2)	AC (26)
	subspecies (0)	spp (12)
	analytical profile index (1)	API (1)
	trypticase soy agar (2)	TSA(1)
	malt extract agar (1)	MEA (1)
	no given long form	single-stage MAS impactor
	no given long form	CM-59
Units nearly always abbreviated	gram per hour	g/h
	liter per minute	l/min
	minute	min
	microbiological colony forming unit per cubic meter	cfu/m^3
	kilometer	km
	degrees of centigrade	°C
Statistics	single-factor analysis of variance	ANOVA
	no given long form	p
	standard deviation	SD
	percentage	%
	number	no 5. car
Others	no given long form	SUV
	more than 2 authors, et alia	et al
	Initials as monograms in the list of Sources	e.g.: Diekmann, N.
	European Union	EU
	Company in German language	GmbH, KGaA
	Company in English	Ltd.
Total	**24 types**	

Table 3. Data about the abbreviations, acronyms, initials of a scientific text /Source: author's own edition

According to Table 3 the scientific text uses units a lot, nearly always abbreviated, as it is standardized in academic papers. AC, as an initial, which stands for air-conditioning, appears 13 times more than the full form. Two problematic acronyms were identified in this text

because they are not written in their full forms at all. MAS impactor (Microbial Air Monitoring System) (internet-9) is not used in its full form neither is SUV (sport utility vehicle).

3.3. Comparison of two different academic texts

H2. I assume that the rate of abbreviations, acronyms, initials are higher compared to full terms.
As we can see in Table 2, the usage of ITE and MTchgLn is 4-5 times more frequent in abbreviated forms than in full terms. But, interestingly, the other pedagogical terms such as CAT and TES and their full forms were equally used.
According to Table 3, the scientific text uses measurement units a lot, nearly always abbreviated, as it is standardized in academic papers. AC, as an initial, which stands for air-conditioning, appears 13 times more than the full term. We can conclude that the rate of abbreviations, acronyms and initials are higher compared to full terms.

H3. I assume that this rate (see above at H2) depends on disciplines.
According to the above detailed results the scientific paper had more types of abbreviations, acronyms and initials (24) than the pedagogical one (15). The number of abbreviations, acronyms and initials is 62.5 per cent higher in the scientific article than in the pedagogical one, so I may say it is a significant difference in numbers. The rate of full terms versus abbreviations in these articles is also different. In the scientific paper authors used the abbreviated forms much more times (AC – 13 times more) (spp or units – nearly always) than the long forms. It is explained by the tradition of the usage of technical terms in academic papers, so it is useless to add their long form. In that trial case I found differences between disciplines concerning the rate of abbreviations, acronyms and initials. Of course, further investigation would be advisable, with bigger number of papers from different disciplines.

3.4. Reading comprehension test with students

Two groups of English speaking students, whose language of instruction is English, were included in my research.

3.4.1 Evaluation of tests of students from The Faculty of Economics and Social Sciences

Group 1 (FESSc) got a shorten version of pedagogical article. There were two tests for Group1, which was divided into A (Test 1A) and B (Test 1B) subgroups.
In Test 1A long form of the term was given. 10 participants filled it in. In Test 1B acronyms were given. 8 participants filled it in.
I realized in Task 1 that acronyms ITE (Initial Teacher Education), TES (Teachers' Sense of Efficacy Scale), CAT (Concerns About Teaching) were successfully (90% - 100%) written down by both subgroups (1A, 1B) but MTchgLn acronym was a problematic one. Subgroup 1A achieved rate of 70 % while subgroup 1B did 50 %. It might mean that acronym MTchgLn was very strange and caused hesitancy that is why they did not write the long term for it correctly: Master of Teaching and Learning Programme.
In the open task (Task 2) the students mentioned two problematic acronyms. 8 out of 18 students (44 %) found MTchgLn as a problematic one. It is parallel with the results of Task1, where 30-50 % of the students had a problem with MTchgLn. The other problematic acronym is TES, which was noted by 6 students out of 18 (33%). They realized that the right one would be: TSES.
In Task 3, true and false statements were given to both subgroups. The right answers were counted and compared to the number of studebts in percentage. It is surprising that the right answers (100%) were given only in two sentences out of six and students underperformed in the case of 4 items in Test 1A. We can see it was a hard task for them to understand the statements well, even if the long form was given in the sentences.

When we compare two things: the comprehension of sentences with pedagogical full terms and the comprehension of sentences with pedagogical acronyms, we have found the following:
- there was one sentence out of six which was comprehended easier (16.6%),
- there was one 100 % right answer in both subgroups 2A and 2B (3. sentences), which indicates no differences in understanding (16.6%),
- there were four sentences whose comprehension was more difficult (66.6%).
Thus, comprehension of sentences was mainly more difficult using sentences including pedagogical acronyms in subgroup 1B compared to subgroup 1A. (See Table 4)

Task3 – Sentences	**subgroup 1A, Test1A with full terms (%)**	**subgroup 1B,Test1B with acronyms (%)**	**Finding: Sentences with acronyms were**
1.Initial teacher education/ ITE was renewed in New Zealand in 2013, as an intention to follow the Scandinavian countries' Nordic model of education.	70	80	easier
2. Concerns About Teaching / CAT survey was a useful tool because it had been modified for the New Zealand context.	100	80	more difficult
3. The Teachers' Sense of Efficacy Scale / TES addresses four efficacy areas.	100	100	no difference
4. Previously made New Zealand's studies have reported that student teachers enter their initial teacher education/ITE programmes with a high sense of self-efficacy.	40	10	more difficult
5. Master of Teaching and Learning programme / MTchgLn was a one-year course-taught master's level degree programme not only for Primary (students aged 5-12) but also Secondary (students aged 13-19) teacher candidates.	90	80	more difficult
6.The examined student teachers' noted themselves as being more able to get through difficult students from first administration/T1 to second administration/T2.	70	50	more difficult

Table 4. Evaluation of the reading comprehension Test1A and Test1B in Task3, in which A and B subgroups are different concerning full terms versus acronyms. (Right answers compared to the number of the participants of the groups in percentage) /Source: author's own research

3.4.2 Evaluation of tests of students from The Faculty of Agricultural and Environmental Sciences (FAESc)
Group 2 (FAESc) got a shorter version of a scientific article. There were two tests for Group 2, which was also divided into A (Test 2A) and B (Test 2B) subgroups.

In Test 2A the long form of the term was given. 4 participants filled it in. In Test 2B acronyms were given. 5 participants filled it in.
I noticed in Task 1 that acronyms AC (air-conditioning system), TSA (trypticase soy agar), MEA (malt extract agar) were successfully (100%) written down by both subgroups 2A, 2B. Measurement unit such as g/h (gram per hour) was easy for members of the subgroup 2A (100 %) but 80 % gave right answers in subgroup 2B.
I found that there were two problematic acronyms, abbreviations: SUV (sport utility vehicle) and et al (et alia), because subgroup 2A's achieved only 67 %, while the subgroup 2B achieved 0 % in the case of SUV. It could mean that the acronym SUV was totally unknown by the members of subgroup 2B, and unfortunately, the long form of the acronym was not given in the original text at all.
In the open task (Task 2) the students mentioned seven problematic acronyms, initials. MAS (Microbial Air Monitoring System) was written by 60% of Group2, because of the lack of long version of the initial. They were right, because the long form was not given in the text at all. Further problematic acronyms were: SUV (20%), API, et al, cfu/m3, g/h, CM-59 (10%).
I conclude that findings obtained in Task 1 and Task 2 support each other and stress the importance of usage of long forms for possibly unknown acronyms or initials (SUV, MAS).
There was an abbreviation: et al, which must be applied in academic writing for students. In case of doubt, the acronymfinder.com site will not help us, because it includes the acronym ETAL, and does not give the proper meaning of et al. According to the acronymfinder.com ETAL stands for Effective Teaching and Learning (internet-10) and not for et alia (and others). There is real help for the meaning of et al in the Cambridge Dictionary (2018): 'Abbreviation for 'et alia': and others. It is used in formal writing to avoid a long list of names of people who have written something together.' (internet 11)
In Task 3, true and false statements were given to both subgroups of FAESc students. The right answers were counted and compared to those of the groups in percentage.
It is reassuring that all of the FAESc students performed well (100%) on the task and understood 5 out of five items in Test 2 A, in which the sentences included the scientific full term (Table 5.). Thus, sentences were comprehended easier in subgroup 2A (FAESC) than in subgroup 1A (FESSc), in which right answers were given only for two sentences out of six (33,3%) and students underperformed in Test 1 A at Task 3. (See Table 4)

When we compare two things: the comprehension of sentences with scientific full terms and the comprehension of sentences with scientific acronyms we can state the following:
-there was no sentence which was comprehended easier (0%),
-there were 100 % right answers to 3 test items in both subgroups 2A and 2B (1.,3.,5. sentences), which means, there is no difference in understanding (60%),
-there are two sentences which were comprehended with more difficulties (40%).

In the light of this, in the comprehension of sentences between subgroups there was no difference at a rate of 60 %. But there were difficulties in 40 % of the sentences, which sentences included scientific acronyms compared to sentences included full terms.

In the light of the above detailed results, Group 2 (students from FAESc) performed slightly better than Group 1 (students from FSSc) see, Table 5 and Table 4.

Task 3 – Sentences	**subgroup 2A/Test2A with full terms (%)**	**subgroup 2B/Test2B with acronyms (%)**	**Finding: Sentences with acronyms were**
1.Standard Petri dishes filled with blood trypticase soy agar/TSA and malt extract agar /MEA were used for bacterial and fungal sampling.	100	100	no difference
2.Air samples were collected two times, before and after servicing of air-conditioning systems/AC in the studied cars.	100	80	more difficult
3.During the tests, impactor was placed at a height of 1.5 meter/m above the car's floor to simulate aspiration from the human breathing zone of the car driver/passenger.	100	100	no difference
4.The concentrations of viable microorganisms in the air were calculated as colony forming units per one square meter/ cfu/m^2 of the air.	100	60	more difficult
5.This study was conducted in six randomly selected cars, produced on the European Union/ EU market, equipped with automatic climate control system.	100	100	no difference

Table 5. Evaluation of the reading comprehension Test2A and Test2B in Task3, where A and B subgroups are different concerning full terms versus acronyms. (Right answers compared to the number of the participants of the groups in percentage) /Source: author's own research

3.4.3 Comparison of evaluations of reading comprehension tests among faculties (Faculty of Economics and Social Sciences and Faculty of Agricultural and Environmental Studies)

Two groups of students were investigated in reading comprehension from two different faculties of our university by giving them shortened versions of specific academic articles and reading comprehension tests.

In my hypotheses (H1) I assumed that small per cent of the abbreviations will be challenging for students.

Both Group 1 and Group 2 had problematic acronyms and initials in their academic texts.

In Group 1 there were two pedagogical acronyms (MTchgLn, TES) out of 15 acronyms and abbreviations which means, that 14% of all the acronyms and abbreviations caused hesitancy.

In Group 2, there were seven scientific abbreviations and acronyms (MAS, API, SUV, et al, cfu/m3, g/h, CM-59) out of 24 acronyms and abbreviations which means, that 29% of all acronyms and abbreviations were problematic. The average of it is 21.5%, thus one fifth of acronyms, abbreviations and initials were challenging. Thus we can conclude that 1 out of 5 abbreviations, acronyms were problematic on average, which is not a small proportion. In the light of this, H1 hypothesis was rejected.

I hypothesized (H4) that English speaking students, whose language of instruction is English, would understand the abbreviations, acronyms and initials in context quite well regardless of which faculty (FESSc - Group1) or FAESc - Group2) they are studying at.
Table 4 and Table 5 show us:
- that sentences were comprehended easier in subgroup 2A (students from FAESC) than in subgroup 1A (students from FESSc);
- that subgroups Group 2 (students from FAESc) overperformed in Task3 subgroups of Group 1 (students from FESSc)
In Group 1 four statements out of six were comprehended less (66%). But in scientific text (Group 2) two statements out of five (40 %) were comprehended less. Thus, in this comparison, Group 2 understood the abbreviations, acronyms and initials better in context in their text. In the light of this, H4 hypothesis was rejected.

4. Discussion

This study set out with the aim of investigating the usage of acronyms, abbreviations and initials in different disciplines through analysing randomly chosen academic articles and comparing reading comprehension tests of students in Group 1 and Group 2.

It was hypothesized that (H1) a small per cent of the abbreviations will be challenging for students. Both Group 1 and Group 2 had problematic acronyms and initials in their texts. In Group 1 there were two acronyms (MTchgLn, TES) out of 15 acronyms and abbreviations which means, 14 % of all acronyms caused hesitancy. In Group 2 there were seven acronyms and abbreviations (MAS, API, SUV, et al, cfu/m3, g/h, CM-59) out of 24 acronyms and abbreviations which mean 29% of all ones were problematic.
The average of it is 21.5%, thus one fifth of acronyms, abbreviations and initials were challenging. Thus we can conclude that 1 out of 5 abbreviations, acronyms were problematic on average, which is not a small proportion. In the light of this, H1 hypothesis was rejected.

Secondly, it was hypothesized that (H2) the rate of abbreviations, acronyms, initials are higher compared to full terms.
As we can see in Table 2, the usage of ITE and MTchgLn is 4-5 times more frequent in abbreviated forms than in full terms. But, interestingly, the other pedagogical terms such as CAT and TES and their full forms were equally used.
According to Table 3, the scientific text uses measurement units a lot, nearly always abbreviated, as it is standardized in academic papers. AC, as an initial, which stands for air-conditioning, appears 13 times more than the full term. We can conclude that the rate of abbreviations, acronyms, and initials are higher compared to full terms. Thus, H2 hypothesis was proven.

Thirdly, it was hypothesized (H3) that this rate (see above at H2) depends on disciplines.
According to the above detailed results the scientific paper had more types of abbreviations, acronyms and initials (n=24) than the pedagogical one (n=15). The number of abbreviations, acronyms and initials is 62.5 % higher in the scientific article than in the pedagogical one, therefore I may say it is a significant difference in numbers.
The rate of full terms versus abbreviations in these articles is also different. In the scientific paper authors used the abbreviated forms (AC – 13 times more) (spp or units – nearly always) more often than the long forms. It is explained by the tradition of the usage of technical terms in academic papers, so it is useless to add their long form. In that trial case I found differences

between disciplines concerning the number and rate of abbreviations, acronyms and initials. In the light of this, H3 hypothesis was proven.
Of course, further investigation would be advisable, with bigger number of papers from different disciplines.

Fourthly, it was hypothesized (H4) that students, whose language of instruction is English, will understand quite well the abbreviations, acronyms and initials in context regardless of which faculty (FESSc - Group1) or FAESc - Group2) they are studying on. My findings were as follows. Table 4 and Table 5 show us:
- that sentences were comprehended easier in subgroup 2A (students from FAESC) than in subgroup 1A (students from FESSc);
- that subgroups Group 2 (students from FAESc) overperformed in Task 3 subgroups of Group 1 (students from FESSc)
In Group 1 four statements out of six were comprehended less (66%). But in scientific text (Group 2) two statements out of five (40 %) were comprehended less. Thus, in this comparison, Group 2 understood the abbreviations, acronyms and initials slightly better in context in their text. In the light of this, H4 hypothesis was rejected.

Some of my hypotheses (H1, H4) were rejected because abbreviations, acronyms and initials are more challenging to understand as I hypothesized. One message of my research is that sometimes acronyms are difficult to understand therefore we should not overuse them in writing.
These data must be interpreted with caution because of the small number of investigated articles and involved students.

Recommendations
Advice should be given to authors that possibly unknown abbreviations, acronyms and initials must be defined in papers.
An interesting finding was that it is important for students to search for abbreviations, acronyms in several sites and dictionaries. Further research would be advisable with bigger number of papers from different disciplines. Future studies on the current topic are therefore recommended.

Note
1 – Per cent is used in British English but percent is used in American English. Interestingly, both per cent and percent are abbreviations which come from Early English spelling per centum. Source: https://writingexplained.org/per-cent-or-percent-difference

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STUDENTS' ATTITUDE TO TEACHING-LEARNING MATERIALS IN THE ELEARNING SYSTEM

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Abstract
ELearning is becoming a key instrument in education at universities and companies fast but it has been poorly researched. This study attempts to answer how students use the educational teaching-learning e-materials, which improves the efficiency of eLearning. No research into it has been done at Szent István University. Therefore, I have designed research which studies the efficiency of our eLearning system. All graduating correspondence students on the Management and Leadership MSc and Supply Chain Management MA programme were interviewed during the research. The results help the curriculum developers to determine the appropriate development directions.
Keywords: education management system (EMS), eLearning, technology-enhanced education

1 Background

1.1 Definition of eLearning system

At the beginning, it is enough to consider the materials stored on the CD. In most advanced courses, the instructor is accessible via the Internet; the user can work with the intelligent education software independently. The process is supervised by the computer. Recently, students have been able to communicate freely on multiple platforms, which are similarly to Web 2.0 (e-learning video 2.0: chat, video, etc.) used for similar services.

It is difficult to produce a single definition of e-learning, which is accepted by most of the scientific community. Sangrà et al. (2012) have collected 15 different definitions along the following four approaches:

- Technology-Driven Definitions,
- Delivery-System-Oriented Definitions,
- Communication-Oriented Definitions,
- Educational-Paradigm-Oriented Definitions.

One of the best-known definitions was defined by Horton in 2011: *"eLearning is the use of electronic technologies to create learning experiences".*

However, I have made my own definition because at university we need a more specific and detailed definition, which is seen below:

- In a broader sense: a training, knowledge transfer or study process supported by digital assets (storage, retrieval, display, forwarding and content feedback, study aids).
- More specifically: an open format and a training framework accessible from a private or public network that enables effective organization of the user's (young or adult) training process and appropriate communication between students and teacher, feedback by teacher on performance of students location and time independently.

Nowadays, literature continues to use and specify the term of eLearning. Complex, extended terms with specified content have appeared like the followings:

- Course Management System (CMS),
- Learning Management System (LMS),
- Virtual Learning Environment (VLE),
- Knowledge Management System (KMS).

It is also worth mentioning another popular term:

- Massive Open Online Course (MOOC)

Yousef et al. (2014: p 9) defined the significance and impact of MOOC on our learning and education processes:

> *"Massive open online courses (MOOCs) have drastically changed the way we learn as well as how we teach. The main aim of MOOCs is to provide new opportunities to a massive number of learners to attend free online courses from anywhere all over the world."*

From the above definition the most significant characteristic of MOOC can be identified: "from anywhere all over the world". The aim of MOOC philosophy is to overcome real geographic distance, not just the distance between home and classroom but also between countries and any other parts of the world.

1.2 The elements of eLearning systems

Three key elements of eLearning are presented in Figure 1.

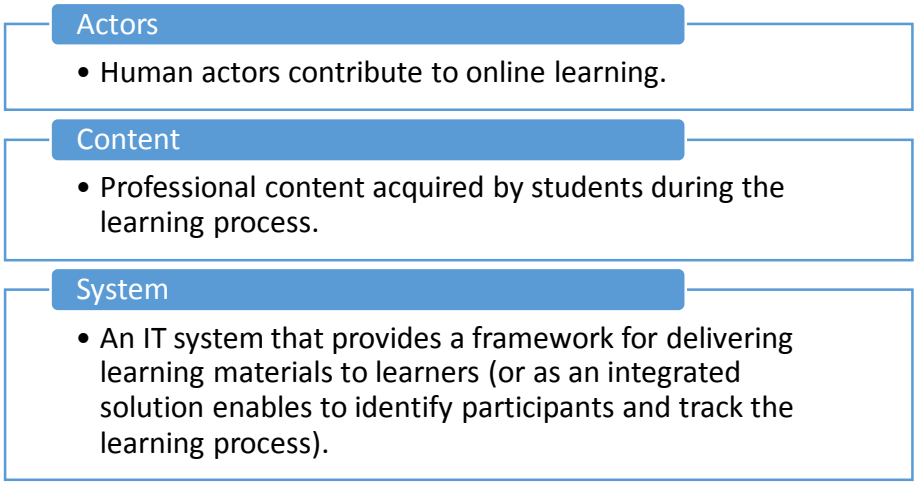

Figure 1. The elements of eLearning
Source: Poór et al., 2017

The following subdivision can be used for actors:

Administrators: their task is to operate and maintain the e-learning infrastructure.

Educational administrators: continuous monitoring of educational activity, student enrolment, compilation of training plans, new training needs.

Curriculum developers: transforming and maintaining learning materials into electronic education materials.

Teachers: mentoring, motivating students, answering their professional questions, evaluating their work, handling student issues, compiling and updating the content of teaching material.

Students: and ultimately the most important one, the student who gains his knowledge, abilities and skills in this particular way.

The distribution of content is shown in Figure 2 while the categorization of system solutions is presented in Figure 3.

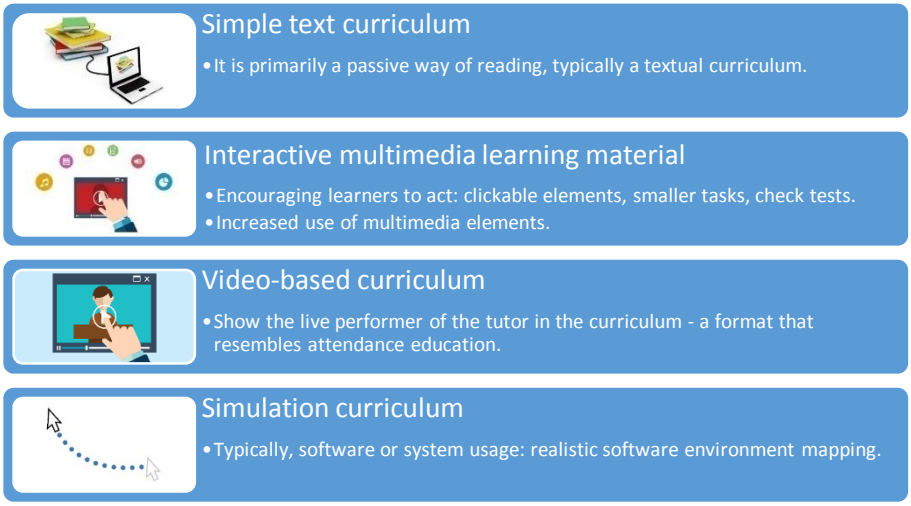

Figure 2. The different types of eLearning systems
Source: Poór et al., 2017

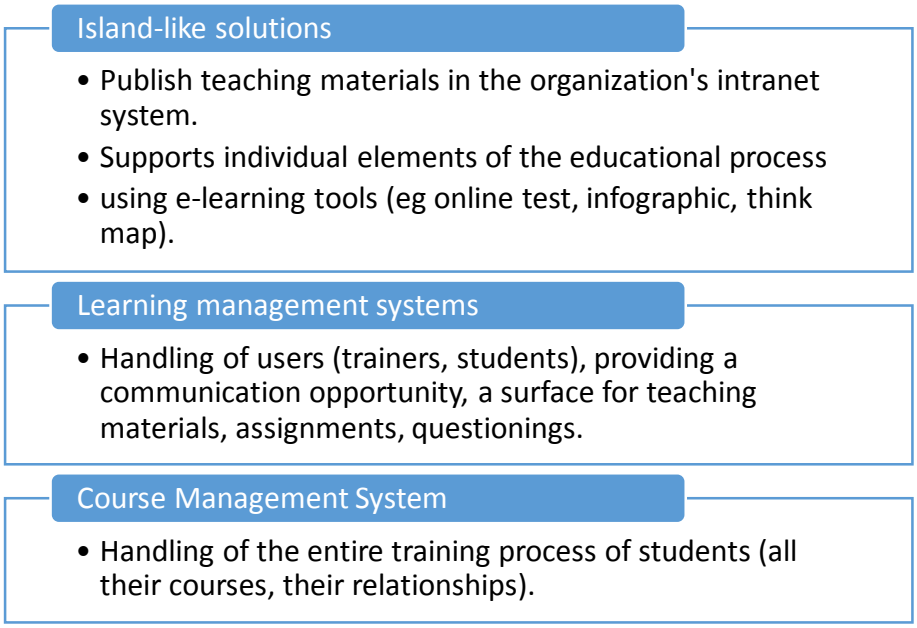

Figure 3. The system solutions
Source: Poór et al., 2017

2 Introduction

2.1 The importance of eLearning

ELearning is becoming a key instrument in education at universities and companies fast. It is unbelievable that no educational institution can function without these eLearning application. So, developing teaching and learning e-materials is gaining a lot of attention by the organisations.

Figure 4 shows how the trend of eLearning searches has evolved on Google since 2004. Obviously, more and more searches are made year after year. It shows the increase of people interested in this topic.

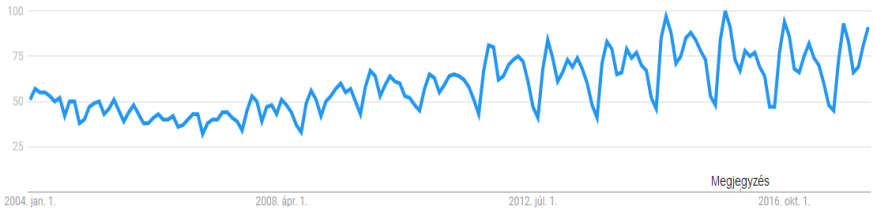

Figure 4. Search trend of eLearning on Google (2004-2018)

It is interesting to observe the pattern of fluctuation within every year. The searches are reduced at Christmas and in the summer months, actually during school breaks (Figure 5).

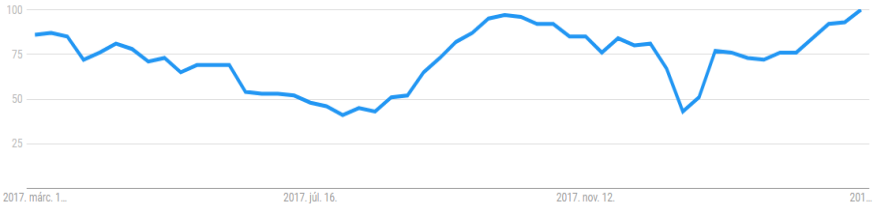

Figure 5. Search trend of eLearning on Google (18.03.2017-17.03.2018)

At the start of school this number is increasing and persists during the semester. In this case it can be said that eLearning is of considerable interest to students.

We develop eLearning curricula with great energy, but we do not know what the student does with it, how they learn from it. Clarifying this is a priority for any further development. Comparable researches elsewhere (other countries) can be interesting but do not trigger on-site studies. (culture, internet access, technological background, education system)

2.2 Research questions

This study attempts to answer the following questions:

1. How do eStudents use the teaching-learning materials?
   a. What is the student's learning habit in the eLearning system?
   b. How do students use eLearning systems?
   c. What do students use for the eLearning system?
2. Which direction of development is needed for e-materials?

Hypotheses

H1: The Internet is used by students to a great extent during their studies, i.e. the Internet is indispensable for students to learn.

H2: Students typically learn on the eLearning interface.

3 Materials and Methods

According to the research question, the survey was conducted among students of Szent Istvan University (SZIU). During the selection of students, we tried to select the majority of students from the economic training programmes at SZIU. Another important point was that the students should be in their last year. Graduating students already have good expertise in answering questions about the eLearning systems at SZIU.

So, data was collected from students graduating from the next three training programmes:

1. Management and Leadership (MA) correspondence training
2. Management and Leadership (MA) full time training
3. Supply Chain Management (MA) correspondence training

Training time	All [person]	Respondents [person]	Proportion [%]
Correspondence	165	120	72,7
Full time	32	27	84,4
Summary	197	147	74,6

Table 1. The proportion of respondents and total population.
Source: author's own compilation

According to Table 1, the questionnaire was filled in by 74.6% of the graduating students, who are considered as the population of the research. It can be stated that the results are considered relevant, realistic and reliable.

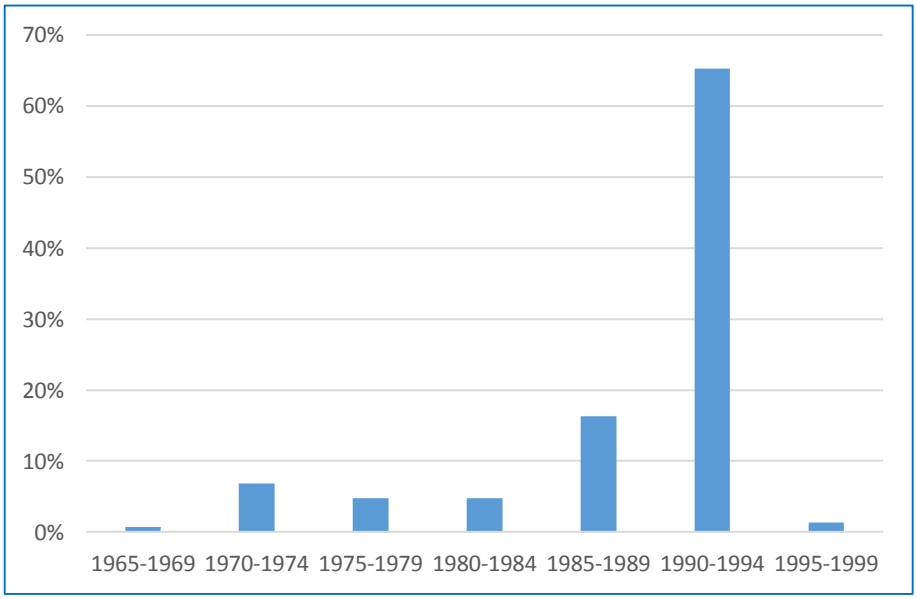

Figure 6. Age distribution function
Source: author's own compilation

No sensitive information was collected during the data collection, so the identification of student's Neptun code (student ID number) did not cause any problems for the respondents. As a result, one respondent could only fill in the questionnaire once, avoiding the redundant data.

Although it is not the subject of the study but from Figure 6 it can be concluded that despite the great number of correspondence students, their age is mostly between 24 and 28 years. Otherwise, it can be important because the fact that this age group is more open to IT solutions can be true.

Figure 7 shows that most of the respondents live in a city. Big city means more than 1 million inhabitants, in this case it is the capital, Budapest. In the questionnaire the term 'city' refers to the settlements above 100,000 inhabitants.

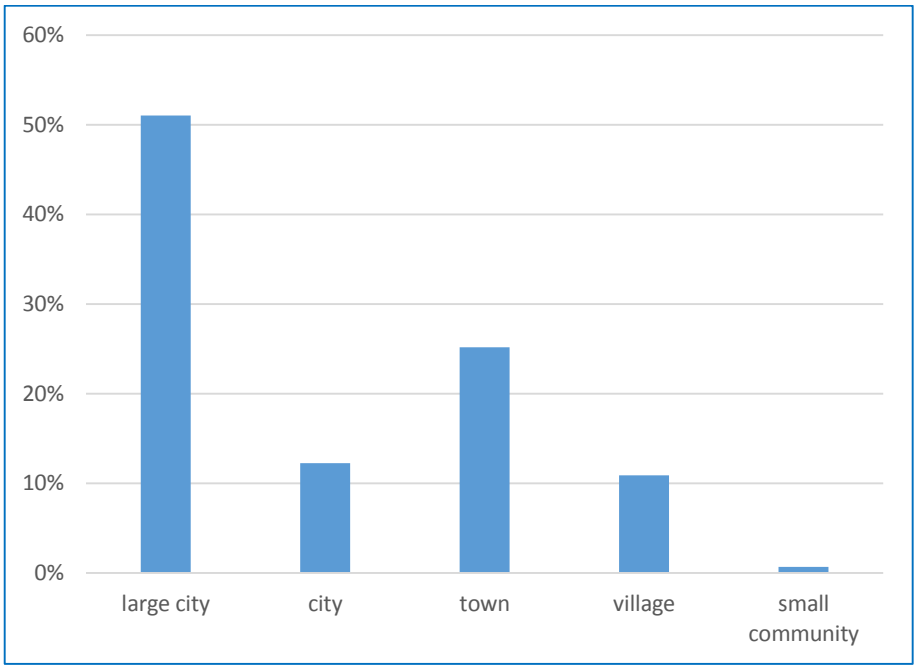

Figure 7. The respondents' permanent residency
Source: author's own compilation

This thesis was written as part of more extensive research, so the full questionnaire is not being cited here.

4 Results

Students received a total of 39 questions in the research. The result of this research paper covers and analyses only 8 questions of the entire questionnaire. The square brackets indicates the number of the question in the original questionnaire.

A total of 39 questions were received by the students during the research. This study covers a total of 8 questions numbered in square brackets.

4.1 The usage of Internet

Question #1: [14] How important is the Internet for you to learn?

The data in Table 2 show that 91% of students (rows of C+D) use the Internet to a large extent for learning. This in itself has a strong correlation with Hypothesis 1.

	person	percentage
A) not at all important	0	0 %
B) rarely, but I use the internet for learning	13	9 %
C) I often use the internet to learn	90	61 %
D) I cannot learn without internet	44	30 %
E) other	0	0 %

Table 2. The importance of the Internet
Source: author's own compilation

Question #2: [17] How often do you use the following tools to learn?

	A) never	B) rerely	C) sometime	D) often	E) usually	F) always	E+F colums
personal computer	58%	11%	4%	5%	13%	10%	22%
laptop	3%	2%	1%	9%	33%	52%	85%
tablet	67%	5%	7%	11%	7%	4%	11%
smart phone	10%	13%	7%	31%	27%	13%	39%
e-book reader	86%	3%	3%	6%	1%	0%	1%

Table 3. The usage frequency of IT tools to learn
Source: author's own compilation

Table 3 shows that students use laptops the most often: 85% use laptops. The use of the smart phone is also a significant. In today's conditions both devices often have Internet access.

As was said above, my first hypothesis: *The Internet is used to a decisive extent by students during their studies, i.e. the Internet is indispensable for students to learn.*
Based on the above, it can be stated that students rely heavily on the Internet in their studies, so the first hypothesis proved to be true.

4.2 Display vs. print out

Question #3: [20] How effectively can you learn from the following types and form of learning materials?

Table 4 shows that printed materials are the most popular with students. They find downloadable materials which are to be read on screen surprisingly suitable. Hence, the printed version is even more preferred.

Unfortunately for developers, the content that can be viewed on the eLearning interface is not considered to be the most suitable material by students. Only video formats can be a bit more popular.

	not at all	a little bit	rather no	rather yes	greatly	fully
printed materials (book, note)	0	7	4	18	36	82
downloadable digital materials (book, note, presentation) on some device	1	10	30	38	46	22
downloadable digital materials (book, note, presentation) printed	0	1	8	15	45	78
textual materials available on the e-learning interface (typically not intended for download)	8	20	45	44	21	9
multimedia materials (text, image, video, animation) can be viewed on the e-learning interface	5	21	29	54	24	14
the subject-related video	17	24	16	49	27	14

Table 4. The effect of different types and form learning materials to learn
Source: author's own compilation

Question #4: [23] Approximately what percentage of downloadable material are printed by you?

There are nearly 70 out of 147 respondents in the 4th Quartile (Q4), they reported that at least 75% of the downloadable learning materials were printed out. This is almost true for 50% of students, as shown in Figure 8.

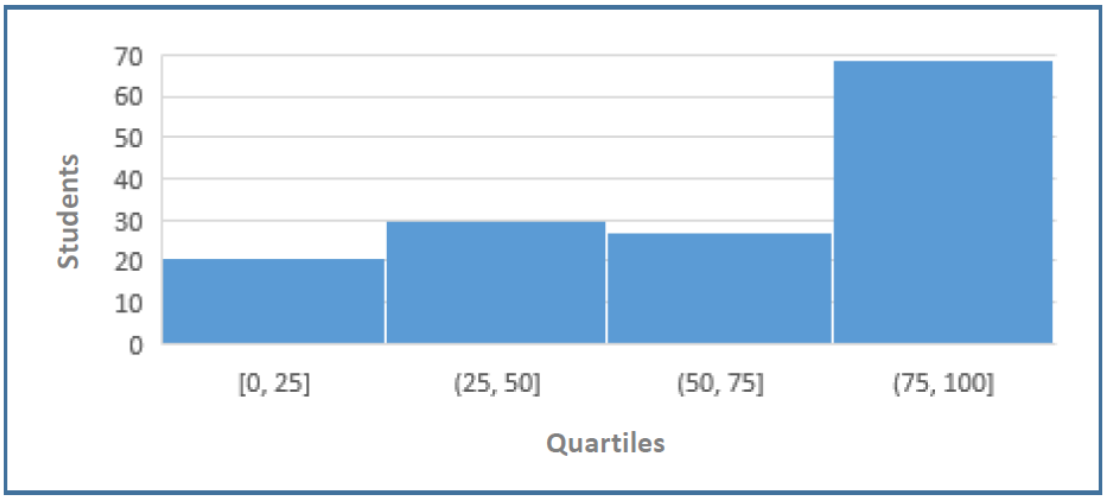

Figure 8. The number of students according to the percentage of printing out the downloadable material
Source: author's own compilation

Question #5: [24] How important do you think it is to make printer-friendly (e.g. black and white, multi-slides on one page) versions of all downloadable materials?

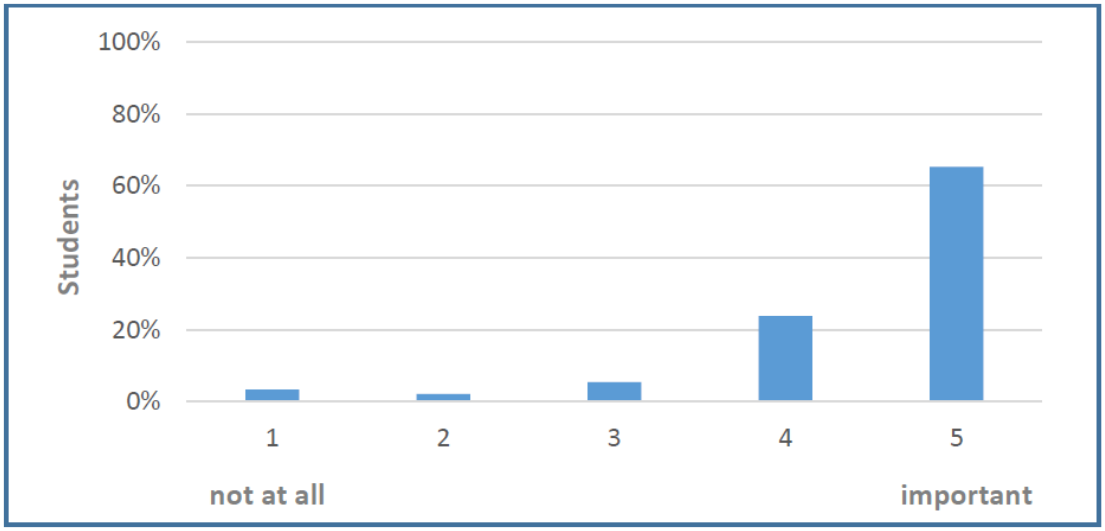

Figure 9. The percentage of students according to think of how important the printer-friendly version is
Source: author's own compilation

Students consider it extremely important that the materials for eLearning should have a printer-friendly version: 65% of students said it is very important, as shown in Figure 9.

Question #6: [25a] If a downloadable course material is available before a lecture, then ... I print to the class in advance.

Question #7: [25b] If a downloadable course material is available before a lecture, then ... I download it to some mobile device and bring it to the lecture.

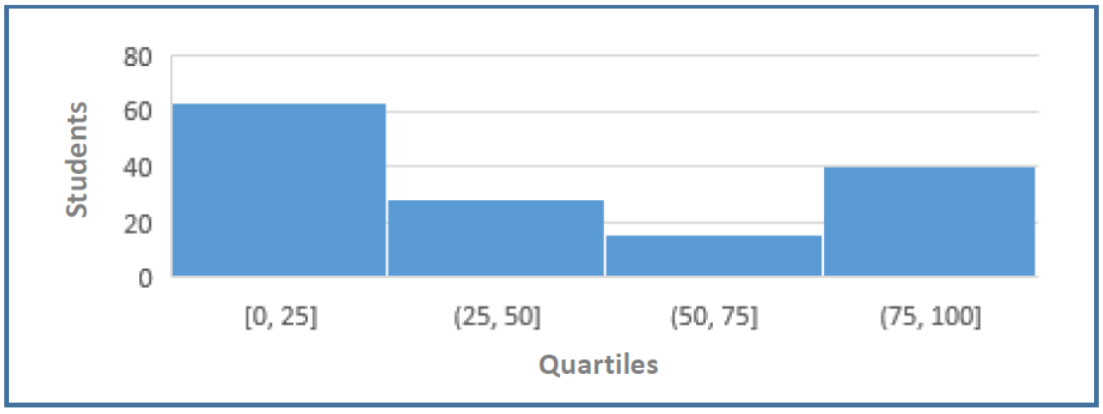

Figure 10. The number of students who print out downloadable course material before the lecture
Source: author's own compilation

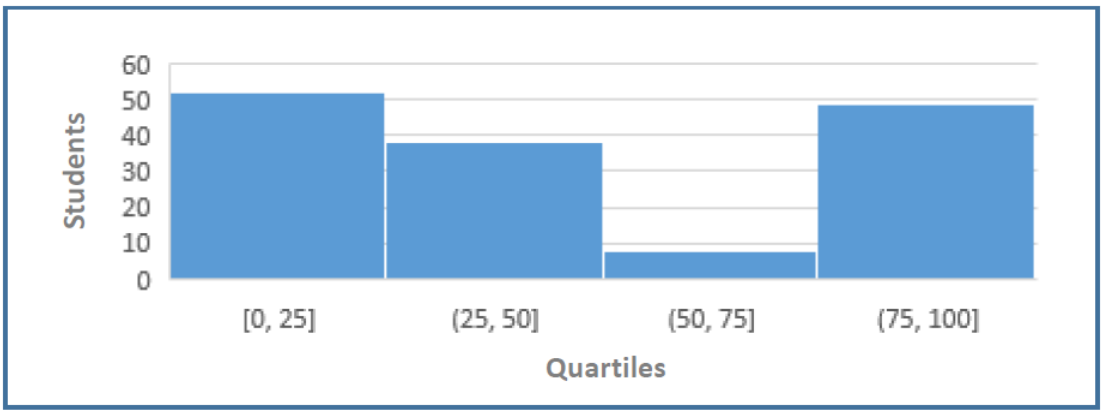

Figure 11. The number of students who download available course material and read on mobile device during the lecture
Source: author's own compilation

An interesting correlation is shown by Figures 10 and 11. The downloadable content is rather read on a mobile device than its printed version. Of the 147 respondents who completed the questionnaire, 60 students indicated that they would print up to 25% of the materials before the lecture. This correlation is found in the 1st Quartile on the Figure 10.

Question #8: [26] How important do you consider the following factors are for projected and disseminated teaching materials?

Printability plays a surprisingly role poorly among aspect of the materials that are presented in the lecture, in the light of the above results.

This was only worse than the visibility on mobile device during the presentation as shown in Table 5. Going backwards comes the visual experience. The second place was for stand-alone processing and the absolute winner was the legible feature.

	1	2	3	4	5
Slides of oral presentation should be readable.	55	53	25	13	1
Slides of oral presentation should be colourful, full of picture	25	31	28	37	26
Slides of oral presentation used for self-study at home on their PC should be detailed	46	31	36	24	10
Slides of oral presentation used for self-study on a mobile device should be readable	0	5	16	31	95
Slides of oral presentation printed out should be well-edited	21	27	42	42	15

Table 5. The features' importance of slides of oral presentation indicated by students
Source: author's own compilation

Overall, it can be stated that the printed materials are preferred by students. Consequently, during the development of curriculum the results indicated by students in the research should be taken into consideration. To sum up readability was chosen as the most important feature.

Based on the above, it can be concluded that Hypothesis 2 is rejected.

H2: *The students typically learn on the eLearning interface.*

5 Discussion

The purpose of the study was to answer the following questions:

1. How do students use the teaching-learning materials?
   - What is the student's learning habit on the eLearning system?
   - How do students use eLearning systems?
   - What do students use for the eLearning system?
2. In this case which direction of development is identified?

Hypothesis:

H1: The Internet is used by students during their studies to a decisive extent, i.e. the Internet is indispensable for students to learn.

H2: The students typically learn on the eLearning interface.

The following questions were asked:

1. [14] How important is the Internet for you to learn?
2. [17] How often do you use the following tools to learn?
3. [20] How effectively can you learn from the following types of curriculum?
4. [23] Approximately what percentage of downloadable curricula are printed by you?
5. [24] How important do you think it is to make print-friendly (e.g. black and white, multi-slides on one page) versions of all downloadable materials?
6. [25a] If a downloadable course material is available before a lecture, then ... I print to the class in advance.
7. [25b] If a downloadable course material is available before a lecture, then ... I download it to some mobile device and bring it to the lecture.
8. [26] How important do you consider the following factors are for projected and disseminated teaching materials?

The answers received to the first two questions indicate that students significantly use computing tools and the Internet to carry out their studies. This is not surprising in itself since the above tools are present in all areas of life. Why would this be different in the field of learning? Consequently, proving the first hypothesis did not cause any problems. And it has also justified the relevance of the research question.

The answers to questions from 3 to 8 were more interesting. These issues are actually focused on research purposes. It is outlined that students use the eLearning only to access the content. The phenomenon shown by the media cannot be observed that content consumption has significantly been transmitted from the Internet. The students continue to prefer traditional ways of learning, resources and modes: books and reading. Consequently, the second hypothesis could not be proved.

As it was conceivable, this study was only one step towards achieving the research objective. The approach outlined in this study should be replicated with other students as well as in other years in order to be able to know the direction needed for the development of eLearning.

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A TEST ON PRIMARY AND SECONDARY SCHOOL STUDENTS' AWARENESS OF INSECTS

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Abstract
Why is it relevant to focus our attention on a neglected animal group, insects? This study examines whether the students living in Budapest or the students living in the countryside have higher awareness of insects. There are some articles and studies focusing on the importance of insects, but no research has been carried out yet which would compare the awareness of rural and capital city students on insects. Therefore I designed a unique research which draws attention to the importance of enhancing children's consciousness towards insects. I used a questionnaire to recover children's awareness on arthropods. My research confirmed my hypothesis: children living in the countryside are more aware of insects' morphology and other features. The key impact of this research is to show the ways of making insects popular with children.
Keywords: insects, awareness, biodiversity, essential, environmental education

1. Introduction

This thesis is based on my Bachelor's degree research. Children have very little knowledge about insects despite the fact that these creatures are really important in our lives. They play an integrate part in the ecosystem as they are part of the food chain.

Devani suggests that there are insects which are the only food source for amphibians, reptiles, birds and mammals, so they are essential. Insects are the foundation of our food chain and they form the class of animals that are still being discovered: new species are found almost every day. Most people would classify insects, like mosquitos, as pests because they carry diseases. However, they are an important food source for other species like fish and birds. The ecosystem is a very complex system, every species are part of it as the elements of the food chain. We should emphasize that insects are an important part of the ecosystem, so they should be valued for their contribution to our world. (Devani, 2016)

Devani also claims in his zoologist article that ants are sometimes considered as pests because they can be destructive in some ways. However, we should be aware of that they play many different roles in our ecosystems such as being decomposers, gardeners, pollinators, and soil aerators. These are essential tasks in the nature which can not be replaced by other animals. (Devani, 2016)

They are also really important regarding biodiversity. Today more than 1.5 million species of insects have been named but some studies claim that there are far more than these to be discovered. Many species became extinct in the past, therefore there should be a collaboration to prevent that more species have the same destiny.

Insects play an important role in several natural processes, such as, pollination, activity in soil, decomposition, roles in a food chain, so they are essential for biomes to have an undisturbed operation. (COLLINS. & THOMAS, 1991)

Haltiwanger suggests that it is really important to know that about 80% of the flowering plants on Earth are pollinated by insects. Most plants need to produce seeds to reproduce but many plants can not do it by themselves. To produce seeds, the female part of the plant needs pollen from the male part of the flower and in the case of some flowers this process is implemented by insects. Bees are not the only pollinators, other insects, such as wasps, flies, butterflies, moths and beetles are also important pollinators, so they help to move pollen from one plant to another. (Haltiwanger, 2014)

Without bees, these crops would cease to exist. Bees are crucial to our existence as well, thus we must work harder to protect and preserve them. Bees keep plants and crops alive. Without bees, humans would not have very much to eat. To put this fact into context, these are many of the crops pollinated by bees: almonds, apples, apricots, avocados, blueberries, cantaloupes, coffee, cranberries, cucumbers, grapes, kiwis, peaches, strawberries and a lot more. Some articles suggest that if bees disappeared, humans would not survive. (Haltiwanger, 2014)

Saul claims that insects and their arthropod relatives are responsible for much of the nutrient cycling, conditioning and aeration of the soil. Fauna and flora would be really poor without them so nature conservation is one of the most important areas in our life to save our Earth. It is not enough that experts know about the importance of insects but also teachers and children should be aware of it. (Saul, 1999)

Today the exploitation of natural resources is becoming more and more intensive. Effects of consumer society endanger the existence of Earth. Flora and fauna is changing constantly. The living world has changed, biodiversity is decreasing and the areas and natural habitats of species are shrinking. Environmental education is a process of teaching the recognition of values and defining concepts which help understand the connection between human and their environment and also develop the required abilities and attitude to assess this connection.

The concept of environmental education was defined in the UNESCO conference in 1979. Environmental protection is a way out of ecological crisis which uses scientific and technical tools in problem solving strategies. Nitschke (1996) claims that environmental education is a new ability to learn which may cause changes in attitude towards of the research and environmental protection. Environmental education should be included in the current education system. (Lükő, 2003)

Recently there have been several efforts in the trend of environmental education both in school and out of class the curricula of environmental education has not been worked out yet. There are a lot of good ideas, initiatives and programmes, but they do not fit into the system of public education, and there are really few schools that focus on environmental education in a systematic way. (Vásárhelyi & Victor, 2003)

People have been living together with insects, which are omnipresent, since the inception of history of mankind. Sometimes people had to run away from mosquitoes, bedbugs, fleas and wasps, which in many cases spread infectious diseases such as typhoid, malaria and yellow fever infecting not only man but also domestic animals. Even the catastrophic damage caused by cultivated plants contributed to this. However, some insects are essential helpers of man, which are cannot be replaced, for example, the pollinators of flowering plants that allowed fruit ripening, honey-producing species, decomposers of dead organisms. Moreover, high chemical insecticide activity blurs the richness of nature in return for short-term profit. (Tillier, 1994)

1.1. Children's awareness of insects

Fortunately, it has been a growing recognition of the importance of really neglected animal groups, such as insects. As previously stated, we have not got too many data on these creatures,

but they have a really important role in supporting the living world. The development of this negative attitude against insects already starts at kindergarten.

We can hardly find cartoons in which there are some of these disliked animals, so insects will not be seen by children as important in the living world. At most they notice of butterflies or ladybirds because of their colourful appearance and even in cartoons these insects are the most popular characters. There is another way for kids to get connected with insects, for example, reading books, such as, books by Gerald Durrell but even in his novels the more popular animals are presented by the researcher-writer.

It can be seen that younger children like young mammals because of their cute appearance and birds because of their colourful appearance. There are quite a few decorative species among insects, but generally these animals are less preferred, some of the children even abhor these animals. The most decorative animals are taught at schools, we should focus on insects much better at schools.

Even though, children can learn very little information about these animals at school, they can meet them every day - even children who live in town - but they can hardly meet a mammal even in their natural habitat. Nowadays, natural resources are being exploited more and more intensively. If we do not take actions to stop these destructive processes, humanity will be irreversibly be going towards its destruction.

It is important to teach about these processes even to young children. Nagy (2012) reported a new and on-going educational innovation, which had been launched in 2011. There is a green day called Compost Day in Hungary on every 10th of October. „The initiation was suggested by several non-governmental organizations and the target groups were schools, kindergartens and other NGOs. The action composting itself - as being part of an environment friendly way of life - would ensure to develop a new way of thinking about natural resources". (Nagy,2012 :389) This day would contribute to know more about creatures (also insects) in compost making and to the education for sustainability. Thus, it is relevant to teach about biological knowledge and to know the environment in situ which can form an environmentally friendly attitude and help to participate in supporting organic development.

If we can achieve this, we have a better chance to avoid the extinction of species in the future. It is important to recognize that those insects which are small and seemingly to be unimportant have the same important role in the balance of nature as the birds and mammals which are liked by most of us.

1.2. The objective of the thesis

The main objective of my thesis was to explore the extent children at elementary schools and at secondary schools know the insects in Hungary and how much they are aware of the importance of little-known insects.

Today in Hungary, from the first grade to the seventh grade children study Nature Study, and from the seventh grade to the twelfth they study Biology. In these classes they can get to know insects.

In this thesis, I examine if the children living in the countryside or the students living in Budapest know the insects better by their appearance, and whether they are more aware of these creatures.

1.3. Hypothesis

My hypothesis was that the children from the countryside know insects more deeply. My other hypothesis was that the children from the countryside are more aware of nature thus they have a more pragmatic knowledge about insects. It is a general assumption that children in the capital city get a better education than children in the countryside but children from rural areas have more opportunities to get to know these creatures in detail because they live closer to forests.

The main goal of my study was to do research by using a questionnaire that how the children living at different places and from different age-groups are aware of the main features of these creatures and their natural environment. Another goal was to review the problems in connection with environmental education regarding insects and arthropods in order to draw attention to these disliked animal groups and even to find some ways to popularize them.

In my opinion, it is really important to deal with insects and to popularize them to children because we should learn this environmental awareness at a young age.

2. Methods

2.1. The structure of the questionnaire

A questionnaire was used in the research. The goal was to compile a questionnaire which contains questions and tasks that can find out how much the children are aware of insects. For example, students choose from the listed creatures the ones that are insects. There are some close questions, and there are some questions focusing on morphological features of insects as well. In the last two tasks students had to recognise the arthropods in the list. It is easy to assess the students' knowledge about insects by these tasks. However, there are 17 tasks in the questionnaire, the highest possible score to reach is 21 points, because there are some questions which have more possible correct answers. The questionnaire was drawn up in such way that it can be completed successfully based on the knowledge children can gain at school in their Biology and Natural Science studies.

Obviously, the questions were compiled according to the sixth graders knowledge level, thus all the three age groups have already studied at least once in their Nature Study and Biology classes. The compilation of the questionnaire was not easy because, unfortunately, there are almost a few pages of curricula in the coursebooks about arthropods.

The questionnaire was filled in by three age-group populations: the sixth, eighth and tenth graders, who live in Budapest and those who live in the countryside. Students of two schools in Budapest and two schools in the countryside, in Békéscsaba and Gödöllő, were involved in the research. My goal was to have the questionnaire filled out by as many children and schools as possible from different age-groups, so that I could get a clearer result of the student's knowledge about insects, and I could assess if the older students have a better knowledge about these creatures.

2.2. The places where the questionnaire was completed

In Budapest the test was completed at Arany János Grammar School on January 6, 2015 and at Baár-Madas Calvinist Grammar School on 14 January. Rural schools, where the test was completed, were in Gödöllő and Békéscsaba. It was filled out in St. Norbert Premontre Grammar School in Gödöllő on January 9, 2015. The last school where the questionnaire was completed was in Békéscsaba, in the Evangelical Grammar School on 18 January. In each class, 20 people answered the questionnaire. Although there were classes where the students of the class reached 30, for practical reasons, the 20 most enthusiastic students were selected to complete the test.

2.3. The design of the questionnaire

The questionnaire consisted exclusively of close questions, which means that respondents had to choose from three or four options that are right or wrong. This questionnaire design is probably the fastest to complete, the least complicated, because if the student does not know the answer, it helps them with optional answers. Moreover, this design also helps to avoid that a question is not completely clear, or there is no chance to misinterpret the questions. First of

all, I made a summative table of correct answers in Excel. After that I analyzed the data from different aspects.

As mentioned above, after answering seventeen questions, a total of 21 points could be reached. This means that, as I worked with 20 people, four hundred and twenty points per class could be obtained as a maximum. The value in the case of most questions were 1 point, but in case of four questions which have a value of two points, for one good answer students could get one point, for two good answers they got two points.

However, if somebody gave 3 answers to a four-point question and there were two correct answers among them, it counted as only one point and one was deducted because of the wrong answer. Generally, it can be seen, that not many students got two points for two-point questions because most of the students gave only one answer to such questions or they gave an incorrect answer. In the first task, students had to find out which of the listed animals was an insect. The second task was to tick the correct answers. Students had to find the true statements in tasks 3,4, 5 and 6. Task 6 was to find out how long the whole life cycle of a Tisza mayfly is. This was a tricky task, because Tisza mayflies live only one day before they die, but their developing period is 3-year long. Questions 7, 8, 9 and 13 are related to environmental education. Questions 10, 11 and 12 asked children about the morphology of insects. Task 14 was also a tricky one, in which students had to find out if moths chew clothes or not. Task 15 was an easy question to answer for those who pay attention in Biology classes and are aware of spiders. In the last two tasks, students had to recognize insects.

3. Results

It is interesting to note that there were only six students who filled out the questionnaire without making mistakes. That is not a good result because 120 students filled it out all in all.

3.1. Comparing the performance of students in Budapest and in the countryside

Comparing rural schools to urban schools, rural students reached higher points in all three age groups. If we have a look at the points in total, it can be shown that while students in Budapest do not reach four hundred points, students in the countryside have a total score of over four hundred among the sixth, eighth and tenth graders. The correct answers given by rural and urban schools are between 45 and 55 percent. There are no outstanding results, which means that students achieved similar results.

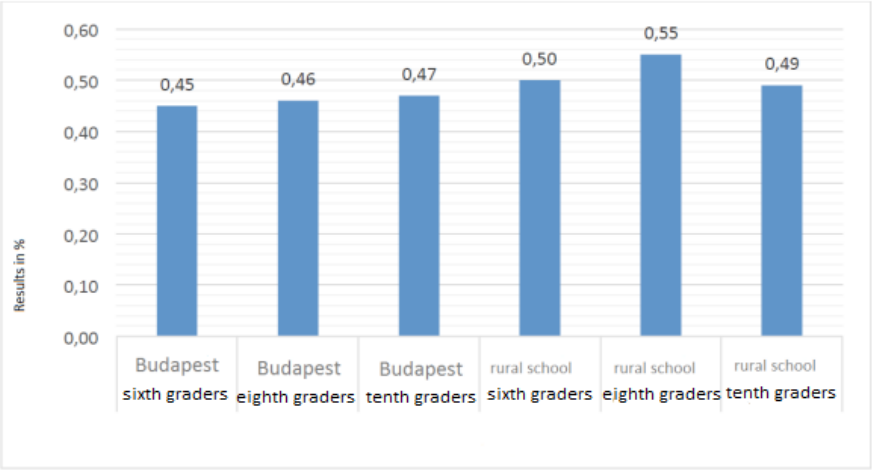

Figure 1: Percentage of correct answers in capital and rural towns

Source: author's own research

Although the difference is very little between the students of rural schools and schools in Budapest, it is more likely that students in rural areas had better knowledge about insects than students in the capital. This is probably due to the fact that they are more active at a place where they meet the animals included in the questions, although that could influence the result as well. Of course, if there is a good biology teacher at school or they belong to a more interested group of children, the results must be better. This difference between rural and capital city students can be seen most prominently in the case of students in Gödöllö, whose performance was better in every age-groups compared to the others.

The students of Békéscsaba have achieved similar results to the students in Budapest. If all three age-groups of students in Gödöllő were taught by the same biology teacher, it is possible that these outstanding results are connected to the teacher.

3.2. Comparison of age-groups

Another purpose of my survey was to analyze the pupils' knowledge on insects as they get older. Before the questionnaires were completed, I assumed that the eighth and tenth graders would achieve better results than the sixth grader students. The results in Figure 2 and 3 show that there are only a few percentage differences between the sixth, eighth and tenth graders in the capital city. Even if it first appears to be an increasing tendency, as in older age-groups students actually achieved better results, at least in the case of schools in Budapest. However, this is not an improvement trend, as there are only one to two percentage differences between the age groups, which can be practically regarded as insignificant. In Budapest the sixth graders filled out the questionnaire with a bad result, the rate of correct answers was only 45%. The eighth grader students reached 46% and the students of the tenth graders reached 47% regarding correct answers. It is worrying that children in the capital city could not answer 50% of the questions correctly. This is interesting because both Arany János and Baár-Madas Grammar Schools are eco-schools, which put more focus on things connected to nature.

In the case of rural schools the results were a bit different. A slightly increasing tendency can be seen between the sixth and eighth graders but the performance of tenth graders was worse than expected. They had worse results even than the sixth graders, which is definitely an interesting fact. As the age progresses, there is no growing interest in the environment. The 50% of correct answers among sixth graders is a relatively good result, which is better than the age-group of urban schools, and the results of the tenth graders.

The eighth grade students in the countryside, both in urban and rural areas, were outstanding regarding all age-groups with their performance of 55%. They are the leaders among the three examined age-groups. It is interesting that, despite the fact that rural tenth graders reached worse results than the other two younger age-groups, they still achieved better results than the students in the capital city.

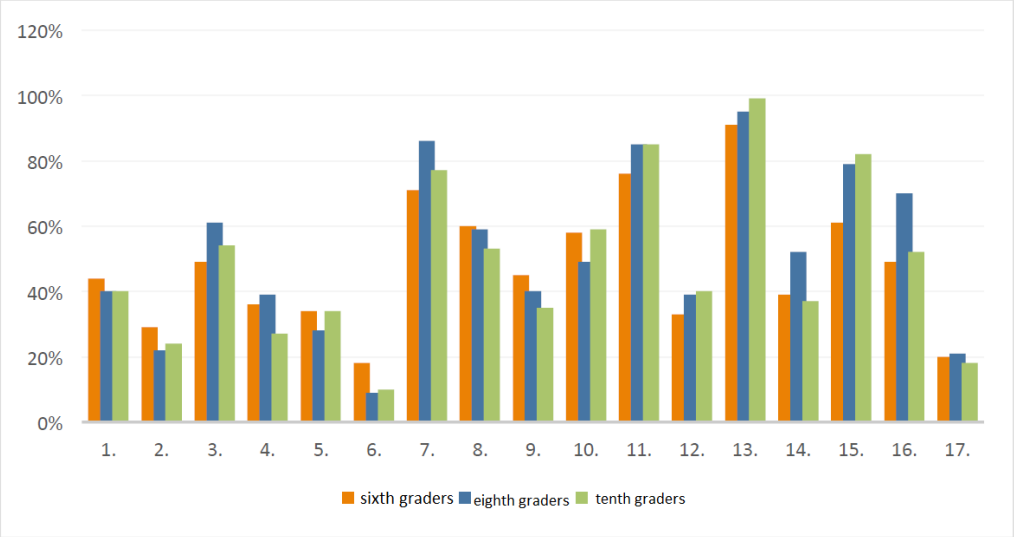

Figure 2: Percentage of correct answers with different age-groups
Source: author's own research

Questions related to the best known insects among students, showed a relatively high percentage. For example, most of the students gave correct answers to questions about ladybirds and bees. This can be explained by the fact that children know bees and ladybirds from the kindergarten, these animals occur frequently in children songs. Question 13 was answered correctly by the most of the children, the rate of the correct answers was above 90%. The question focusing on ladybird showed a high percentage as well, around 80% of the students answered it correctly. In the case of the other questions there were not prominently good or bad results, so I do not discuss them in detail.

3.3. Comparison of the results of each school

Figure 4 clearly illustrates that the performance of Szent Norbert Grammar School in Gödöllő was the best among the schools all in all. However, it is a little bit worrying that even the students of this school were not able to exceed 60% of the correct answers. The results of the other three schools could barely reach 50% regarding the correct answers. It might be a little bit difficult to fill out the questionnaire, but I surely expected better results than those.

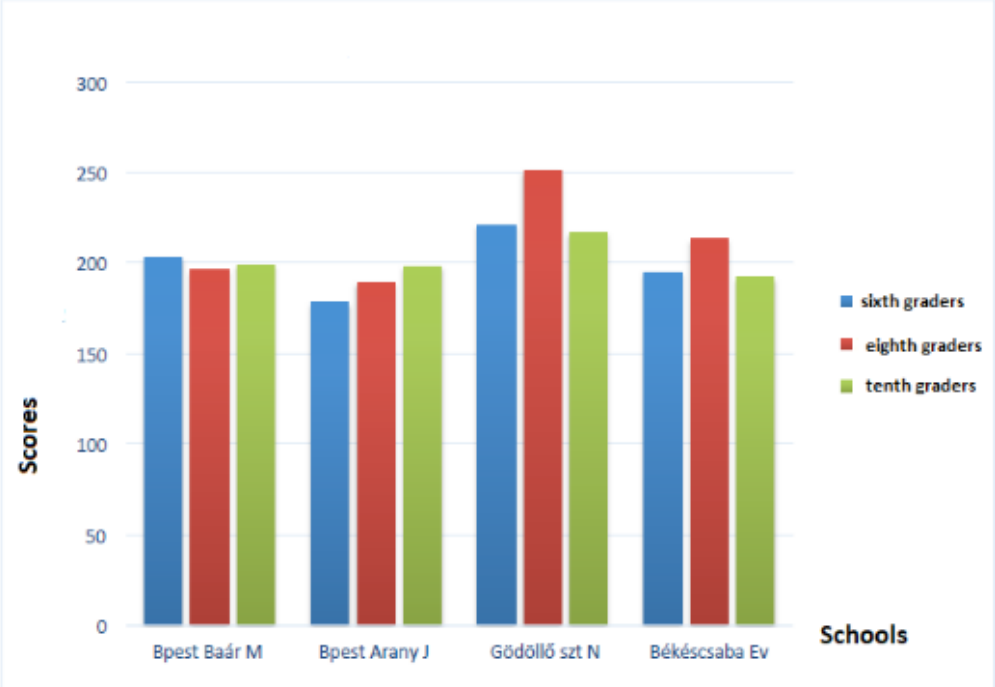

Figure 3: Comparing results of different schools and age-groups
Source: author's own research

Sharp differences can not be observed in the results of schools. Baár-Madas Calvinist Grammar School and Evangelical Grammer School in Békéscsaba performed very similarly, there was only 1% difference between the performance of these schools. There is only 10% difference between the best and the worst performing school's results, which is actually insignificant. This is a fact that a little better result can be seen in the case of rural schools but far-reaching conclusions can not be drawn from these data. Thus, it can not be declared, with such slight differences, that Biology education would remarkably be better at the school in Gödöllő.

schools/questions	grades	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	total	correct answers in %
Bpest Baár M	sixth	18	7	21	5	10	2	14	23	11	10	15	7	20	10	13	16	1	203	48%
Bpest Arany J	sixth	21	5	20	6	14	1	14	23	5	11	15	8	16	3	9	4	3	178	42%
Gödöllő szt N	sixth	18	6	14	8	20	6	13	24	13	12	17	9	17	9	13	13	9	221	53%
Békéscsaba Ev	sixth	14	5	23	10	8	5	16	26	7	13	14	2	20	9	14	6	3	195	46%
Bpest Baár M	eighth	9	2	22	8	7	3	14	20	10	7	16	8	19	13	19	14	5	196	47%
Bpest Arany J	eighth	16	3	23	5	8	3	16	21	8	10	16	5	17	11	15	9	3	189	45%
Gödöllő sz N	eighth	23	6	28	8	18	1	20	25	6	11	19	15	20	8	18	19	6	251	60%
Békéscsaba Ev	eighth	16	7	24	10	12	0	19	28	8	11	17	3	20	10	11	14	3	213	51%
Bpest Baár M	tenth	18	3	29	4	14	2	15	20	6	8	19	10	20	4	16	9	2	199	47%
Bpest Arany J	tenth	17	4	21	4	15	3	15	22	8	16	14	4	19	8	17	8	3	198	47%
Gödöllő szt N	tenth	14	8	18	9	11	2	15	19	9	12	17	10	20	11	18	16	8	217	52%
Békéscsaba Ev	tenth	15	4	18	5	14	1	17	24	5	11	18	8	20	7	15	9	1	192	46%
		199	60	261	82	151	29	188	275	96	132	197	89	228	103	178	137	47		
Total		480	240	480	240	480	240	240	480	240	240	240	240	240	240	240	240	240	420	
correct answers in %		41,5	25	54,4	34,2	31,5	12,1	78,3	57,3	40	55	82,1	37,1	95	42,9	74,2	57,1	19,6		

Figure 4: Scores reached in each task in different schools and age-groups
Source: author's own research

The students in Baár-Madas Grammar School had a similar result in all three generations. The students in Arany János Grammar School showed a slightly improving tendency from the sixth graders to the eighth graders. The eighth graders were better than the sixth graders, however,

eighth graders reached a little bit more points than the tenth grade students. At the schools in Gödöllő the sixth graders and tenth graders reached similar results.

At this school, the eighth grade students were the best. In the Grammar School in Békéscsaba, the eighth graders were the most successful in filling out the questionnaire and there was only a few percentage difference between the sixth and tenth graders.

4. Discussion

In my thesis, I was dealing with a less popular animal group, insects. Unfortunately, very little attention is paid to these unpopular animals, especially compared to what important role they play in wildlife.

It can be concluded from the results of the questionnaire survey that, unfortunately, students showed a fairly weak overall performance. Considering that the answers to these questions are included in the curriculum of Nature Science or Biology subjects, the results were surprisingly poor. The students of the school in Gödöllő showed the best result, though 55% performance is poor, it can be considered as good when comparing to others. Primarily I would not explain this disappointing result with the failure of public education. In my experience, the children perform worse in case of some natural science subjects, because their attention is increasingly focusing on the subjects which are included in the school-leaving exam. As the school leaving final exam is approaching, these subjects no longer catch the attention of students, because they know they will not test their knowledge about these in their mature exam. Students attention is shifting towards optional subjects. However, there may also be some students at elementary schools who do not pay enough attention to their Geography or Biology studies.

In this case teachers can also be blamed, because they do not use an interesting methodology. When I was turning over the pages of the primary school and grammar school Biology textbooks, I noticed that the writers of the textbooks strive for providing as many colorful images as possible in the textbooks. This is honourable, because the image can often teach more about a certain animal than a long text. However, I did not get the results I had anticipated beforehand.

At the same time, it can be said that the the textbooks do not highlight the role of insects in biodiversity, they contain some data about their appearance and specifics or mention one or two facts about their nutrition. It is important to transfer this knowledge, focusing on insects, to story books, cartoons and nature films and more sophisticated, more complex textbooks. As there are more and more schools declared as eco-schools, there are more effective pedagogical methods (projects) using the methodology of collaboration between subjects, thus the information about these little essential creatures would be more effectively imparted to children.

Interdisciplinarity is really important in the case of science subjects, because these are coherent with each other. It would be important that environmental professionals and nature conservation experts provide a message to children and adults, as efficiently as possible, that emphasizes the importance of preserving nature. It can also be an effective way of teaching about arthropods or to hold special classes to students in which they can see and touch insects that learn about. This way they can get to know them better by watching and touching them, thus they may like these creatures.

Classes held in nature are good opportunities for children to see arthropods in their natural habitat. Spending time in nature is not only healthy but it also enhances the effectiveness of teaching and learning. Students can study more quickly, if they see, touch, feel, hear the insects. Another good way to help them like these animals and grow their awareness towards them is smart phone applications, by which they can learn about insects a lot. Children really like using their smart phones all the time, this can be an active way to learn a lot about these

creatures, about their morphological and other features. We should not prohibit the use of smart phones, we should use them in classrooms as tools of teaching. Fortunately, there are more and more approaches focusing on the issue of conserving nature and its fauna.

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