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IMPORTANCE OF THE ORGANIZATIONAL CULTURE IN THE DIGITAL AGE BUSINESS

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Abstract: *This paper examines the importance of the organizational culture in the digital age. In the paper it is shown what are the major definitions of the organizational culture, and digital age as well. The most important researches in different fields of business in the global and digital age are shown. Also, authors mentioned the necessity of studying organizational culture as digital culture, and its influence on the business in the age of digitalization. The purpose of this paper is to emphasize significance of the organizational culture in the digital age in organizations, to contribute to achieving positive business results by doing business in different situations conditioned by the need for constant learning and adapting by adjusting business for Internet and computer use. Also the paper presents some problems that appear in the organizational culture, learning and communication related to digitalization.*

Keywords: *organizational culture, digital age, Hofstede's theory, learning, digital skills*

1. INTRODUCTION

In our digital and global age, employees in organizations should strive to become informed and engaged in digital community in an evolving digital culture. Furthermore, education of employees should be challenging in terms of learning through critical exploration of the Internet and participation in online communication in a way which will provide them with success in their work and easier adjustment to modern ways of doing business in conditions where the Internet is present in all areas of business. Today most business communications and transactions are conducted via computer mediated communication and email is the most familiar type of this communication. In fact, email plays a crucial role in establishing and maintaining business relationships, both within a company and with external contacts.

In the digital age, organizations need to reinvent themselves at a structural level and to become more flexible. It is important to identify major trends of digital skills for employees and managers. Organizational culture must be focused on learning, mobility, rewards and competency system which imply business value according to the right development in digital age.

Authors (Deepti Bhatnagar and Leena Bhandari) argue that organizational culture is a crucial organizational variable that can facilitate or impede the change process.

2. ORGANIZATIONAL CULTURE – CONCEPT AND DEFINITIONS

There is not one unique definition of organizational culture. By examining extensive literature of organizational culture and utilizing many of scientific and research papers, we can present organizational culture as the following:

Organizational culture presents system of assumptions, beliefs, values and norms of behaviour, developed and extended by the group in the organization, through common experience in interactions, manifested through symbols of their thinking and behaviour.

Autor Edgar Schein (Edgar Schein, 1984) in his work presented definition of organizational culture:

“Organizational culture is the pattern of basic assumptions that a given group has invented, discovered and developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and, therefore to be tough to new members as the correct way to perceive, think, and feel in relation to these problems”. A given group is a set of people who have been together long enough to have shared significant problems, who have had opportunities to solve those problems and to observe the effects of their solutions, and who have taken in new members. A group's culture cannot be determined unless there is such a definable set of people with a shared history.

According to The Business Dictionary (Business Dictionary) organizational culture includes an organization's expectations, experiences, philosophy, as well as the values that guide member behavior, and is expressed in member self-image, inner workings, interactions with the outside world, and future expectations. Culture is

based on shared attitudes, beliefs, customs, and written and unwritten rules that have been developed over time and are considered valid.

Some authors, such as Needle (Needle D., 2004), point out that organizational culture includes organization's vision, norms, systems, symbols, language etc. Author defines organizational culture as collective values, beliefs and practices of employees, a product of factors such as history, size of organization, strategy, management style, national cultures and other factors. Corporate Culture however refers to culture deliberately created by management to meet strategic ends.

Cultural differences manifest themselves in several ways. From the many terms used to describe manifestations of culture, the following four together cover the total concept rather neatly: symbols, heroes, rituals, and values.

Organizational culture affects the way people and groups interact with each other, with clients, and with stakeholders. Also, organizational culture may influence how much employees identify with their organization (Schrodt, 2002).

Studying the literature, we can find different approaches to organizational culture. Some of them are:

- Person culture and market culture
- Adaptive culture and adhocracy culture
- Power culture, role culture and hierarchy culture
- Task culture and clan culture.

The most cited typology of organizational culture in the literature is typology by Harisson, which was later modified by Charles Handy (Handy C., 1993). According to this typology there is distinction between four types of culture:

- Power culture
- Role culture
- Task culture
- Person culture.

Charles Handy designed 15 dimensions, explained in the form of 15 items: the type of „boss“; the type of „well-behaved subordinate“; the way of determining company's priorities by its employee; the type of employee promoted within the organization; the way the organization treats its members; exerting control and influence within the organization; task distribution; employee motivation in accomplishing tasks; teamwork; team competition; dealing and managing conflicts; decision making; communication and control structure within the organization; ways of responding to external environment.

Handy uses the Greek Gods as metaphors for each cultural type because each God represented a particular trait or set of values.

- ZEUS CULTURE or power culture is based on personalities with power and influence coming from a central source, usually the leader. However, the success of the organization depends on the luck or judgment of key individuals. In this culture, personal contacts are more important than formal liaisons.
- APOLLO OR ROLE CULTURE underlies logic and rationality. Organizations with this culture have formal structures and well defined rules and procedures. The structure defines the authority and responsibility of individual managers. It is specific for large organizations with predictable work and stable environment.
- ATHENA'S CULTURE OR TASK CULTURE usually has matrix structure or it is organized in form of project teams. Management is seen as completing a series of projects related to problem solving. In this culture, ability to accomplish a particular task is more important than formal status. This is the culture of variety and creativity. Organizations with this culture are flexible and problem solving oriented.
- PERSON CULTURE is presented as DIONYSUS CULTURE. It is also named existential culture. It is found in an organization whose purpose is to serve the interests of the individuals within it. Organizations with this culture are characterized by management having lower status than professional work, and their success depends on the talent of the individuals.

One of the most used concepts of the organizational culture is Hofstede's culture framework.

Hofstede (Hofstede G, 1991) asserted that culture is learned from one's social environment but not inherited from genes. According to Hofstede (Hofstede G., 1993), culture is "collective programming of the mind that distinguishes the members of one group or category of people from others". He argues that culturally everyone belongs simultaneously to several different kinds of groups and is variously influenced by different layers of mental programming within him or herself. Hofstede examined a large survey by IBM between 1967 and 1973 covering more than 70 countries. Author's first idea was that cultural features can be conceptualized and measured across specific dimensions.

The original four dimensions of the culture are (Hofstede, 1991):

- Power Distance
- Individualism/Collectivism
- Uncertainty avoidance and
- Masculinity/Femininity.

Some years later, authors (Kevin D. Lo, Richard D. Waters, Nickas Christensen, 2017) added two more dimensions:

- Long term orientation/Short term orientation
- Indulgence- restraint.

POWER DISTANCE is the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally.

INDIVIDUALISM/COLECTIVISM

Individualism is presented as a society in which the ties between individuals are loose: everyone is expected to look after themselves and their immediate family, and collectivism is a society in which people are integrated into strong cohesive in-groups from birth onward, which throughout people's lifetimes continue to protect them in exchange for unquestioning loyalty (Hofstede, 2005).

This dimension is defined as "the extent to which the members of a culture feel threatened by or are anxious about ambiguous and unknown situations." (Hofstede Geert, Hofstede Gert Jan, 2005).

Individualism can be defined as a preference for a loosely-knit social framework in which individuals are expected to take care of themselves and their immediate families only. Its opposite, collectivism, represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty. At the individual level, individualism is consistently associated with overconfidence and over-optimism.

UNCERTANTY AVOIDANCE

The uncertainty avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. Countries exhibiting strong uncertainty avoidance maintain rigid codes of belief and behavior and are intolerant of unorthodox behavior and ideas. These societies value beliefs and institutions that provide certainty and conformity (Hofstede, 2001).

MASCULINITY/FEMININITY

According to Hofstede, a society is called masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, while women are supposed to be more modest, tender, and concerned with the quality of life. However, a society is called feminine when emotional gender roles overlap: both men and women are supposed to be modest, and tender, and concerned with the quality of life. (Hofstede, 2005).

The masculinity side of this dimension represents a preference in society for achievement, heroism, assertiveness and material reward for success. Society at large is more competitive. Its opposite, femininity, stands for a preference for cooperation, modesty, caring for the weak, and quality of life. Society at large is more consensus-oriented. Masculinity refers to the extent to which cultures strive for ego-goals and competitiveness. Masculine cultures stress stereotypical gender behavior, and the dominant values are success, money, competition, and assertiveness. Masculinity is not correlated with other Hofstede's dimensions.

LONG TERM/SHORT TERM ORIENTATION

The last dimension is the Confucian dynamism, which is known as Long-term vs. Short-term Orientation. It was added after the original four in order to distinguish the difference in thinking between the East and West. In terms of the choice of Confucian ideas, this dimension captures the extent to which people have a future-oriented mentality rather than focusing on the present. In societies with long-term orientation people know many truths, and are thought to have more flexible thinking. Hence, they tend to be thrifty with money investment. Relationships are largely categorized on the basis of status. Meanwhile, in societies with short-

term orientation, people believe that there is only one absolute truth and expect quick results, which represents a more static attitude (Barkema and Vermeulen, 1997).

According to Hofstede, long-term orientation stands for the fostering of virtues oriented towards the future rewards, persistence and thrift, in particular. However, short-term orientation stands for the fostering of virtues related to the past and present, respect for tradition, saving face, "and fulfilling social obligations," in particular. (Hofstede, 2005)

INDULGENCE-RESTRAINT

This dimension refers to the degree to which a culture allows for gratification or suppresses its regulations.

It is this set of Hofstede's dimensions that is now most frequently used in organization and management research. (Kevin D.Lo, Richard D.Waters, Nicklas Cristensen, 2017)

Hofstede's cultural dimensions are widely adopted in different areas of business, corporate risk taking and final business performance.

2.1. Researches of organizational culture in the literature

In the literature dozens of research papers which examine organizational culture using the Hofstede's theory of cultures appear. Hofstede's theory is used in many different fields of research work. Some of them are shown below.

Authors (Mohamed H.Thowfeeka and Azizas Jaarar, 2012) investigated impact of pedagogical approach in the formation of new teaching and learning platform (e-learning). They used Hofstede's model in their study. They studied the ways in which the instructors from South Eastern University of Sri Lanka adopt information system depending on their cultural differences, and, subsequently, what are the reactions related to its adoption. In other words, they studied how cultural factors influence instructors' information acquisition and the use of it in further work with their students. They pointed out that cultural factors can explain the behavioral variation of instructors in accepting and implementing e-learning system. They suggest cultural differences should be studied carefully before implementing an e-learning system. In that way, conventional teaching and learning methods can be overcome. The e-learning method is preferred by both students and educational administrators. The study focused on cultural factors in order to implement the new system successfully. The findings show a number of cultural factors that influence intention to accept an e-learning system and also reveal some of the significant indications over the cultural dimensions which should be carefully considered while implementing an e-learning system in an educational institution. The study notifies the educational institutions to focus more on cultural factors that would explicitly describe the view of instructors about e-learning acceptance at their institutions.

According to Nadia Z. Jaber (Nadia Z.Jaber, 2015) some fundamental culture values are found in the knowledge base of the Palestinian social culture. There is also a reflection of the values on teacher's classroom practices and on the effect of those practices on student's cultural identity in the context from a cultural perspective. In the paper, author used Hofstede's cultural framework. She described some fundamental cultural values in the five cultural dimensions of the Palestinian culture, using Hofstede's framework and its implications on teacher's classroom practices and student's cultural identity. After the research author agreed with Hofstede that cultural dimensions constitute another important component of culture in addition to cultural norms. It is emphasized that understanding and perceiving the dimensions of the Palestinian culture through analysis, interpretation and critique, can promote successful interactions and will help to recognize the impact on the identity, or in other words on students' cultural identities. This will further enable educators to create a culturally informed learning environment where the society can establish useful educational practices which motivate everyone involved in the learning – teaching process.

Johannes C. Cronj (Cronj J. 2011) interpreted cross-cultural blended teaching and learning using Hofstede's cultural dimensions. He studied experiences of professors from South Africa and students from Sudan during a two-year Internet supported Master's course in Computers in Education. The purpose of this research is to determine the extent to which Hofstede's quantitative static research could be used as a basis for an essentially qualitative dynamic interpretation. In his paper he tries to uncover what commonalities were constructed in the process. It was found that in this case, dimensions such as power distance and uncertainty avoidance tended to amplify each other, while together they resulted in a movement leading away from individualism towards collectivism. Three elements seem to play a role when cultures meet: reduction of communicative uncertainty, construction of shared meaning, and appropriate use of technology. More research should be conducted to uncover the elements that are common to cultures because emphasizing commonalities seems more useful than trying to overcome differences.

Erkki K.Laitinen and Arto Suvas (Laitinen E, Suvas A.,2016) investigated the influence of Hofstede's cultural dimensions on financial distress prediction in companies in 26 European countries. Findings have shown that Hofstede's dimensions significantly moderate the effects of many financial predictors in failure prediction. The study concentrates on Hofstede's four original dimensions of national culture.

Some authors (Degens N, Hofstede Gert Jan, Beulens A, Krumhuber E, Kappas A, 2016) created a digital self-contained cultural general training due to the fact that digital intercultural training tools play an important role in helping people to mediate cultural misunderstanding. They found that experimental and story-based approaches may lead to different perceptions of participants. Later, they incorporated virtual characters to evaluate if experimental incidents in an embedded story can lead to an attribution of perceived differences in behavior to specific differences in culture and to users becoming less judgmental of inappropriate behaviors by people from different cultures.

Some researchers (Kevin D. Lo, Richard D, Waters, Nicklas Christensen, 2017) examined how Hofstede's six cultural dimensions are reflected on the official corporate Facebook pages from 259 organizations on Fortune magazine's Global 500 list. They tried to determine how Facebook is used by the Global 500 companies. They found that all these corporations have similar overall presence on Facebook, but the individual elements (About us, updates and media) are different in relation to cultural dimensions. This study might make important statements about the emergence of global social media culture.

One important study (I-Chen Lee, Carol Y.Y.Lin,Te-Yi Lin, 2017) argued about the difference of national intellectual capital from the perspective of national culture and illustrated how national leaders of policy-makers increase their country's national intellectual capital. Authors found that countries with high intellectual capital tend to exhibit a common culture of low power distance, weak uncertainty avoidance and individualism, in research sample of 26 countries. They suggest to increase the country's intellectual capital by striving for a culture of equity, freedom and safety. They argued that national culture, a deliberate effort of human beings to control the environment and reduce uncertainty, may be a potential factor that differentiates the intellectual capital of countries. Based on Hofstede's cultural typology, authors found that the five dimensions of national culture have different influence on national intellectual capital.

3. DEFINITION OF THE DIGITAL AGE

The early literature on the digital age dates back to a time when technical possibilities of information coding mainly consisted of computer programming and analogue data transmission (Valenduc G., Vendramin P., 2017). Alain Touraine (Touraine A., 1969) and Daniel Bell (Bell D.,1973) were the first authors who wrote that the post-industrial world would be dominated by intangible production and consumption, based on information processing and dissemination. Information is defined as 'the storage, transmission and processing of data as a basis for all economic and social exchanges' (Bell, 1973).

According to Elisabeth E. Bennett (Bennett E., 2014), organizational culture is central to virtual human resource development (VHRD), which was defined as a media rich and culturally relevant web environment that strategically improves expertise, performance, innovation and community building through formal and informal learning. The growth of virtual technologies increasingly locates human interaction, collaboration, and socializing within virtual spaces. Thus, virtual human resource development states that technology should be culturally relevant, as well as media rich, to have the best chance of improving human resource development outcomes, such as learning, performance, growth of expertise, innovation, and the bonding of a community together.

2.2. Examination of organizational culture in the digital age

Below follows an overview of research results in literature in the field of organizational culture in the digital age. Conceptualizing culture, according to some authors (Carlton N., 2014), refers to **digital culture** as the integration and adaptation of comprehensive computer technologies for practical, creative, and connective platforms and practices. As digital technologies have become every day routine, membership in digital culture has grown. (López A., 2012) New technologies in each part of business field and the use of computers have influenced people's communication, cognition, and behavior. McLuhan (McLuhan 1966) proposed we necessarily adapt to new ways of thinking and being in the world when we reorder our senses into new media.

In different researches, authors (Choi M, Cristol D., Gimbert B., 2018) identify levels of digital citizenship, defined in terms of individual's thinking, skills, and behaviors with regard to Internet use. (Choi M, 2016) The concept of digital citizenship is presented by five dimensions:

- Technical skills
- Local/Global Awareness

- Networking Agency
- Internet political activism and
- Critical perspective.

There is also a research paper in the field of future directions in the digital computation humanities for data driven organizations (Upadhyay S., Upadhyay N., 2017). The authors consider discipline of humanities and social sciences has been transformed by the digitalization of the world's knowledge, tradition, heritage, culture and expressions. In their work, researchers, scholars and academicians (Schreibman S, Siemants R, Unsworth J.,2008) attempt to understand how knowledge in the 21st century is transformed into information through computational techniques, particularly within computational artifacts and infrastructure. The authors present a roadmap to establish new modes of knowledge formation enabled by the massive transformation of knowledge, society and culture in the network and digital environment.

A study conducted by Mitra Madanchana and Hamed Taherdoost (Madanchana M., Taherdoost H, 2016) explores organizational culture and its effect on E-mail communication using Hofstede's theory of culture and organization. The study's results showed the influence of organizational culture on e-mail communication in the organization. Organizational culture can affect the way people communicate within the organization. Also, organizations have their own culture and way of doing things, implementing their mission and vision statement. As seen from previous definitions of organizational culture, communication in organization is one of the most important elements of organizational culture. Informational technologies play very important role in organizations and, consequently, e-mail is used extensively as a means of computer mediated communication. E-mails play a crucial role in establishing and maintaining business relationships, both within a company and with external contacts.

As a part of organizational culture, Alina Daniela Mihalcea (Mihalcea A., 2017) examined talent management in the digital age. Study focuses on identifying the major trends and strategies concerning talent management programs and development of digital skills for employees and managers. Human resources need to evolve skills for managers and employees in the digital age. By developing core of skills in this age, managers become distributors of content through social media platforms. The digital economy implies usage of new information and communication technology in innovative and efficient means by companies. The use of mobile and analytical technologies implies the need for training and professional development of the existing employees.

4. CONCLUSION

In this paper we aimed to explain the necessity of understanding the organizational culture in the digital age. The growth of virtual technologies increasingly locates human interaction, collaboration, and socializing within virtual spaces. It is important to understand what is the role of organizational culture in the new age, to emphasize potential power of leader's ability to change or shape an organizational culture and to identify factors that influence organizational culture in the age of digitalization defined as thinking, skills, behaviors and communications with regard to the Internet use. The development of the computational artifacts, social media, and network infrastructure has provided a unique opportunity to organizations and their leaders, to enhance their understanding of the organizational culture types and dimensions in the digital spectrum. The current literature research work explores the role of organizational culture in the age of digitalization and provides the future directions for the future researchers in our country. It is important to mention, future research should include research work in the field of organizational culture in the digital age in our county and involve both theoretical and practical exploration on the sample of companies doing business in our country.

By studying the organizational culture in the terms of digitalization, we can conclude that media is affecting everyone using computers on a daily basis, and every business has to become global. It means that organizational culture has to become global. Over the last few years, differences between national cultures become less significant. By using the Internet and computers in every field of work and our daily life, differences between people as well as companies from different countries are reduced. Sometimes it can be a disadvantage due to the fact of growing competition.

This way companies are faced with challenge to educate and train employees in a multicultural way, to evolve adaptive experiences related to new media uses, to use digital and internet tools in their daily business, to communicate using technologies such as presentations, e-platforms, e-mails and online networks of commerce and exchange. For millennial generations it could not be a problem, but older generations, born before 1980, require additional attention by company management in terms of digital education and skill building, necessary for sustainability in the new age. New set of skills is necessary for the talent management as well, due to the presence of many social networks (Linkedin, Facebook, Instagram)

Communication as an element of organizational culture evolved in the past time. Conventional ways of communication are replaced with the new ones, digital and electronic. It is important to establish business communication as a part of strategic communication plan in a digital way, using digital literacy, using social media platforms, often using official language (for example English is the most common used language). E-mails and video conferences play a crucial role in digital communication and have replaced traditional ways of communication in organization such as letters, faxes, memos etc. Also, it should be mentioned that symbols have become more visual as well.

In conclusion, organizational culture in the digital age should be digital culture. Traditional values are thrown into oblivion such as collectivism at work and gender differences but there is more than necessity to study an organizational culture in terms of visual symbols, e-platforms, digital skills of employees, e-communications and modern values of business. As authors Blythe and O'Neill said, new media are actively creating, remediating and disseminating contemporary culture and cultural contexts (Blythe Light, O'Neill, 2007).

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ANALYSIS AND FORECASTING IN THE ERA OF BIG DATA

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Abstract: *The process of analyzing large quantity of data, as well as evaluating and forecasting, is very complex, since it's necessary to position oneself in regard to future events, which are susceptible to various influences unknown during the forecasting process and which may or may not happen. The process of analyzing and evaluating large quantity of data, and evaluation of its value and reliability, as well as finding relations, trends, patterns and correlations is very complex. With this in mind, prediction of future events is extremely difficult and requires high attention, trained analysts and applying modern scientific methods and techniques.*

Keywords: *Forecasting, Analytics, Business, Big Data, Decision making.*

1. INTRODUCTION

Under modern circumstances, monitoring business processes and decision making still represents a big challenge. Business management is being carried out under effects of globalization and rapid development of technologies which, on one hand offers the possibility of simpler access to information, raw material, business partners and buyers from all around the world, whereas on the other hand the business management becomes susceptible to the risks of consequences related to events and processes carried out in other business areas or parts of the world.

Availability of computers, smartphones and other personal devices, modern informational systems and systems for advanced databasemanagement have all enabled simpler, faster and more effective processing of large quantity of data. In addition, there has been an increase in the quantity of data that are generated worldwide with the different contents, formats and passed on via web pages, blogs, social networks, etc. This way, huge number of generated data may provide the managers with new knowledge relevant for decision making. The complexity of topics, contents, formats, scope and quantity of data create new problems for analysts that could be solved only if the existing methods and techniques would be adjusted to new conditions. Moreover, analysts should be prepared to assess the validity, select and process the data in an adequate manner and make analysis and create forecast. Simultaneously, the necessity arises to discover new ways to adapt to conditions under which it is becoming more and more difficult to correctly analyze information, identify risks, important processes and trends and forecast changes and significant events of decisive importance for selection of business strategy and policy.

In that situation, in the area of business management it is very important to properly analyze conditions under which the company is running, but also to predict possible changes that would affect success of the business. In the era of rapid and hardly predictable changes it represents a great challenge that could be overcome if the problem is approached in a comprehensive manner, by employing various experiences and results of the scientific researches in this area. In that environment, apart from traditional problems, modern business analysts face uncertain business environment and increased amount of the available data. However, the role of properly selected and well prepared business analysts and managers is still crucial in support of the decision making process.

2. BUSINESS ANALYTICS AND FORECASTING

Modern business conditions contribute the accelerated development of some disciplines that should be able to offer an answer based on scientific principles regarding the issue of how to make a business decision with less risk. To this end, development of business analytics is very important as it includes possibilities of the informational technologies, demands of the managers and challenges of making business both presently and in future.

Modern IT technologies provide efficient and affordable solutions for collecting and storing data, however challenges still remain. Key challenges of modern analysis can be grouped into three main categories based on the data life cycle: data, process and management challenges (Sivarajah, Kamal, Irani, & Weerakkody, 2017).

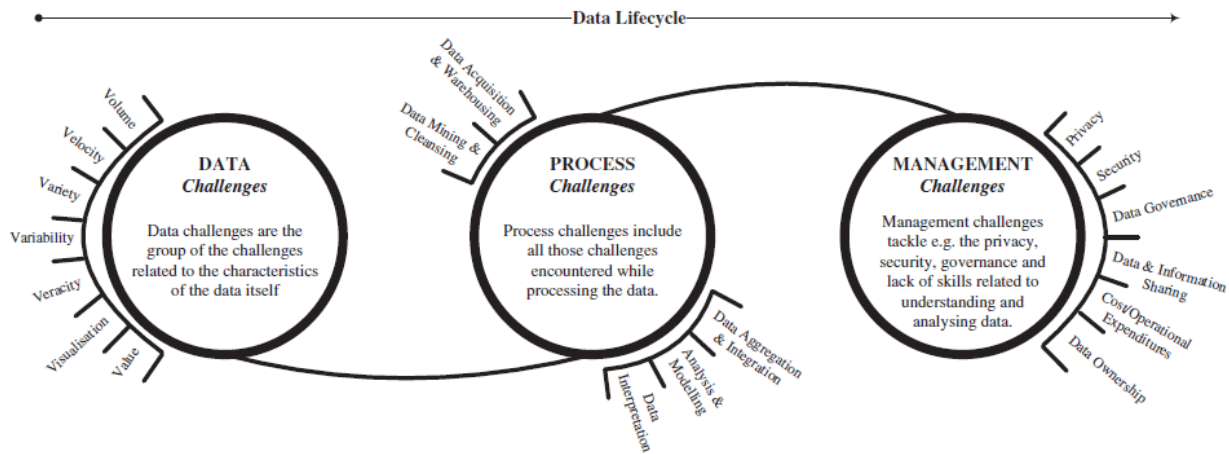


Figure 1: Classification of Big Data challenges (Sivarajah et al., 2017)

There are three main types of business analytics that offer various solutions – descriptive analytics, predictive analytics and prescriptive analytics (Vujošević Mirko & Vujošević Dušan, 2014). Particular significance should be attached to complexity-to-value ratio, offered by some areas of business analytics related to increased significance of forecasting future events in terms of proper decision making on further business moves.

At the initial level, there is a phase of reporting about certain processes as well as analysis of reasons why the results of production, sale etc. are such. In this part of descriptive analytics there are data and reports about current indicators important for business management, such as utilization of capacities, availability of stocks etc. The next phase of the predictive analytics includes assessment about what may happen as well as certainty and probability of certain events significant for business management. At the very top of complexity there is prescriptive analytics that should develop various scenarios and simulations in order to properly evaluate the results and consequences of decisions made.

New circumstances of business management characterized by rapid changes, numerous information and uncertain future force the organizations to rapidly adopt business policy, whereas business decisions encompass increased risks which could be minimized by modern disciplines (data analysis, visualization, simulations etc.) and advanced techniques supporting decision making under almost unpredictable circumstances (processing large quantity of data from various sources and of various type and reliability, forecasting etc.). Big data and business analytics have potential to enable evidence-based decision making through a single efficient process, and prepare high quality analysis and precise forecasts from high volumes of fast-moving and diverse structural and non-structural data (Gandomi & Haider, 2015).

3. PREDICTION AND FORECAST CHALLENGES

There are different types of predictions and forecast from the simpler ones, e.g. when we decide what to wear based on the weather forecast; to the more complex when assessments are made on the currency rate, raw material prices, economic changes, regional and global security assessments, etc. The latest researches suggest that not everyone has equal abilities to successfully analyze data and make accurate predictions. However, results confirm that it is possible to significantly improve these abilities (Tetlock & Gardner, 2015). Professor Tetlock, who is one of the pioneers of research in this field, started a research in 1984 which lasted for almost two decades in which more than 280 people of different profiles participated (political analysts, journalists, analysts from different government institutions, etc.). Participants prepared over 27,000 different assessments which referred to events and occurrences in the time frame of the next ten years. Research results (Tetlock, 2006) showed how complex a prediction is, especially if it's for the longer period of time. However, it was noticed that some individuals have better results and that these prediction abilities can be improved.

Beside the academic community, significant number of government and private organizations and institutions are also interested in forecasting technics and methods. There are specialized organizations and agencies which are working on gathering and processing information, evaluation and analysis, as well as predicting future developments. They use technics and methods which are based on experience and scientific principles, while analysts go through special training during which they gain necessary knowledge and abilities in order to make predictions more accurate and realistic.

Government intelligence organizations responsible for making complex security assessments are also interested in improving predictions. Many research conducted for the needs of USA intelligence community are especially interesting. For example, for the needs of IARPA –Intelligence Advanced Research Projects Activity (agency is responsible for developing and testing advanced technologies for improving the quality of analysis and for producing assessments in the framework of USA intelligence community) organized a forecasting competition that lasted from 2011 until 2015. In four tournaments conducted in that period, participants prepared probability estimates about many different, political and economic global events. Participants were recruited from research centers, universities, professional organizations and they were given between 100 and 150 questions related to national security and prepared by intelligence agencies (Chang, Chen, Mellers, & Tetlock, 2016). Their average age was forty, sixty-four percent of respondents had a bachelor's degree, and fifty-seven percent had completed post-graduate training. During all tournaments more than 1,800 participants (who submitted more than 25 answers), giving more than 888,000 forecasts in total (Friedman, Baker, Mellers, Tetlock, & Zeckhauser, 2017). Their background covered a diverse range of fields including mathematics, computer science, photography, law, pharmacy, biochemistry and others.. Diversity of topics in the tournaments was large enough that no one was an expert on all subject matters (B. A. Mellers, Baker, Chen, Mandel, & Tetlock, 2017).

Competition of this kind can be useful to the scientific community but also to the decision makers to test the methods in real conditions (Tetlock, Mellers, Rohrbaugh, & Chen, 2014). Some authors describe ideas and quality of geopolitical forecasting with "warranted tempered optimism" (Mandel & Barnes, 2018) and other found based on analysis of numerous geopolitical forecasts that foreign policy analysts can "consistently assess probability with greater precision" (Friedman et al., 2017). The goal was to define and test the best methods and technics for producing analysis and predictions which would be applicable in the work of intelligence agencies. The intention was also to with the participation of academic community representatives, private companies and participants-volunteers identify capabilities, technics and desirable forecasters' characteristics which contribute to forecasting accuracy. In the part of research related to producing geopolitics assessments, five teams answered different questions of interest for the USA politics. Teams answered these questions by giving numeric probability of specific development. During this competition several hundred questions were given and teams answers were analyzed and evaluated based on realized predictions. After the first year, team lead by professor Tetlock showed significantly better results in comparison to the other four teams. After the second year that gap was even bigger, hence it was decided to continue only with the monitoring of the Tetlock's team.

At the beginning of the research participants were divided in groups in order to define the level of correlation of the value of the assessment in relation to the type of preparation (probabilistic-reasoning, scenario training and group without additional preparation) and teamwork (individual work, control group and group additionally prepared for teamwork). During the competition, participants also got 199 questions prepared by IARPA (B. Mellers, Stone, Atanasov, et al., 2015). From these questions, 150 were yes or no questions, while for the rest they gave a choice of three - five answers. During the competition, participants were given feedback on their results in comparison to the others. Teams had the freedom to choose their members, as well as to develop their own technics and methods for producing individual and joint assessments. Winning team was composed of carefully chosen individuals who got best results in previous stages and are among 2% most successful participants.

Already at the beginning the differences were noticed in the quality of some answers, evaluated by Brier scoring rule. As the time passed this trend was more noticeable, which is seen in Figure 2. which is representing results of 100 the worst and 100 the best participants after evaluating answers to first 25 questions. Although it could have been expected that by time this differences would reduce, this trend continued and differences grew which showed that initial results were no coincidence or statistical error (Mellers et al., 2015).

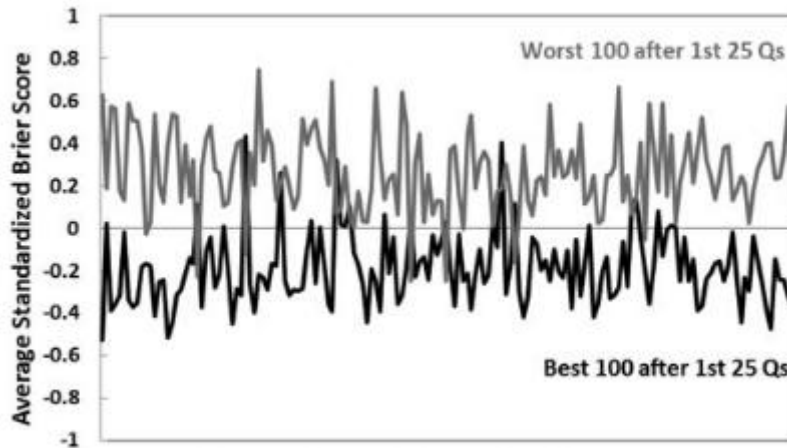


Figure 2: Quality ratio of answers given by the best and the worst participants

Result analysis related to some categories of participants show significant differences in the quality of answers. Figure 3. represents quality ratio of answers given by the group composed of the best participants which worked as a team on producing joint assessment (the best 2%), very good analysts (the best 3-5%) which individually produced assessments and a group composed of the remaining participants. Conclusion is that during the research differences grew in favor of the group of the best participants who prepared answers as a team, while the two other groups by time showed deterioration in answers (B. Mellers, Stone, Murray, et al., 2015a).

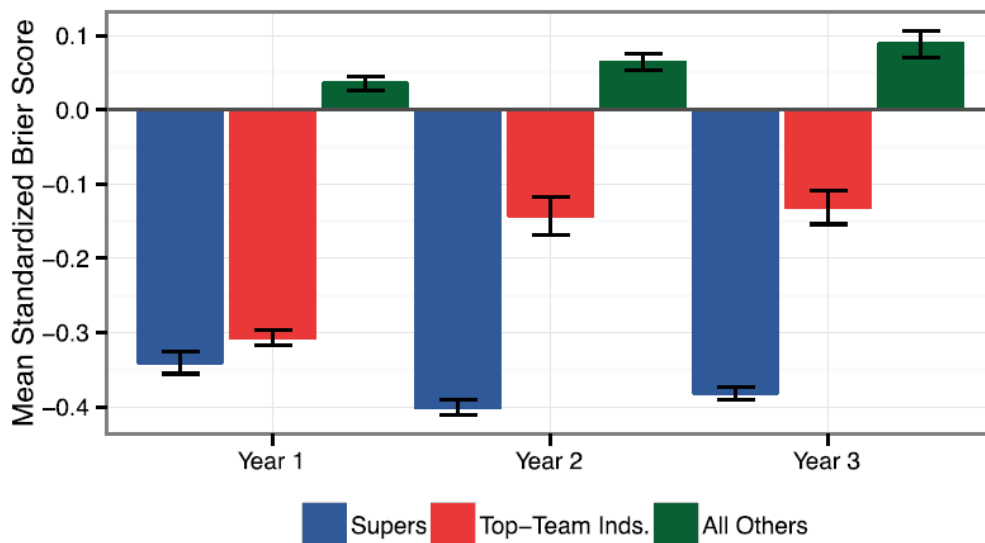


Figure 3: Quality ratio of answers given by groups of participants (B. Mellers, Stone, Murray, et al., 2015a)

Based on these indicators it can be concluded that some of the participants in the research under the same conditions recorded better results, as well as that by working in a team in a longer period of time these abilities could be further improved.

During the tournament training was organized for participants. Main topics were about statistical and mathematical models, probabilistic reasoning, calibration and resolution, Brier scoring, biases in probability judgment etc. (Chang et al., 2016). Training consisted of two modules: probabilistic reasoning and scenario training for the first year. Second year of tournament training was improved with graphics tools. Next year political science content module was added. In the fourth year participants were offered improved web platform with graphical elements and pictures. Analyses of results lead to a conclusion that a trained forecaster performs much better than control group (without training). Effect of training was shown in Figure 4.

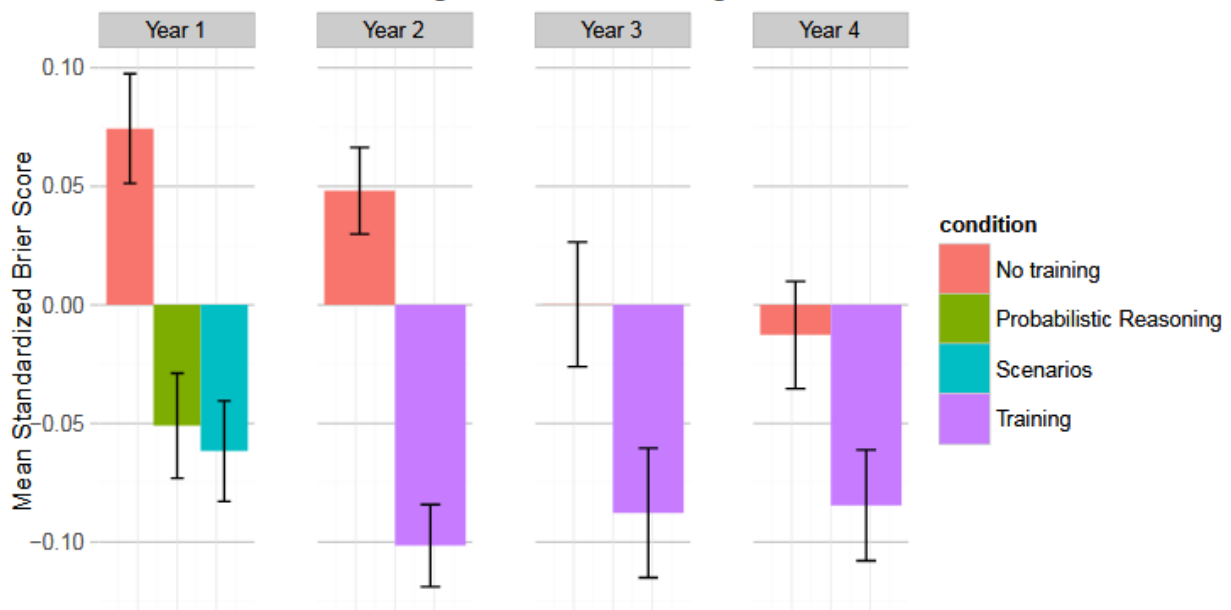


Figure 4: Training Effects (Chang et al., 2016)

That and similar scientific experiments can help state agencies and private companies in monitoring and improving their performance in objective analysis and precise and timely forecasting. Decision science and modern IT and analytical tools can help protect from negative consequences of wrong decisions based on incorrect information, analysis and/or forecast. Available quantitative methods for measurement and testing of cognition and behavior, theoretical models of human judgment and decision making can be used as tools in decision making process. That can be applied in intelligence and business community which are both dealing with uncertainty and problems in conveying assessments to end users typically using only verbal probabilities (Dhami, Mandel, Mellers, & Tetlock, 2015).

Some other authors support this kind of ideas. For example, prominent Richard Hauer wrote about methods and techniques that can help in overcoming problems in intelligence analytics. He considers that it is very hard to find a good way for defining adequate evaluation criteria for probability of the development, which led to a problem during creation of the complex assessment. Bearing that in mind, he points out the need to improve analytic techniques and create new "analytic culture", different from the current, with improved coordination among analysts, continued testing and questioning of the initial hypothesis, improved selection and training (Hauer, 2007).

4. GOOD CHARACTERISTICS OF THE FORECASTERS

Based on the previous experience and results of the research, Tetlock thinks that the most successful participants are not necessarily high intelligence individuals, but with good education, and knowledge from different fields. Capability of making a good forecast depends on numerous factors, but is also correlated with intelligence. However, unlike some aspects of intelligence, forecasting can be learned, improved, and sharpened (B. A. Mellers et al., 2017). Conclusion is that those participants stand out from the others because of their commitment in resolving problems; ability to separate important from unimportant issues, as well as facts from assumptions. Their most important characteristics is an ability to divide problem into smaller parts, analyze validity of the available data and their impact on the problem solution.

Important characteristic of good forecasters is an ability to present problem in the way it is recognized in the past, as well as to determine principles that are repeated and could be used for resolving a concrete problem. Besides this, it is unnecessary for the forecasters to be able to separate personal experience and opinion from the available facts. It is very important, that in the environment of growing changes, resulted by many different things, forecasters can explore different types of information, as well as not to seek only for the arguments that will support his opinion. Moreover, the participants who are ready to adjust their perspective of view due to surrounding changes and new knowledge have performed better results.

Participants of the research with the best scores were mostly pragmatic, open-minded, who carefully seek, select and check information. They were curious and able to analyze data from different fields and gained from different sources. Especially teamwork is important, and ability to express opinion without fear. They are

able to listen and accept different, and opposite opinions if they contribute in better analyses of the situation and precision in assessment.

We can conclude that the most successful participants don't have a special "power" or ability. They actually use some common skills that result with a good understanding of the problem and making decision. Because of that, ordinary people who do the analysis can upgrade that skills, and by individual or teamwork make better quality of analyses and assessment.

It is especially important that forecasting accuracy could be reached through teamwork (Ungar, Mellers, Satopää, Tetlock, & Baron, 2012). With good team organization and quality interaction among motivated members, good results could be reached. But in case of lack of communication and slow dynamics, imposing opinion and unhealthy competition, results of the prediction and assessment could be wrong (B. Mellers et al., 2014). Bearing in mind all mentioned above, structure of the teams is very important as well as a good preparation, interaction and teamwork that will lead to more quality conclusions.

Beside individual ability and characteristics of the forecasters, for better assessment it is important to improve a procedure for making analysis. For work that is more efficient, development and improvement of the quality of the assessment it is unnecessary to monitor result of the assessment in the future in what level assumption will become reality. Even if the time shows that the assessment is not good enough, it is unnecessary to study initial data, recognize process and define reasons of the wrong assessment. Without additional analysis and conclusions, the process cannot be upgraded and reaching precision in assessment is impossible.

5. CONCLUSION

Analysis, assessment and forecasting in modern age requires the need for upgrading current methods and techniques, as well as seeking for the new models that are adjustable for the modern times. Effect of the globalization and improved development of the technology (primarily telecommunication) make the information more accessible, it has shortened the time requested for making decision, in some level it has made it easier to do the assessment. However, managing this data became a problem, selection of the information became harder as well as assessment of their value and this has increased possibility for making mistakes in forecast.

Researches in this field contribute in finding solutions that are applicable in everyday life, but as well as during the complex assessment for the need of the private sector and government. This especially refers to a need for the careful selection of the individuals that do the analysis, their training and courses, continued improvement of their abilities and upgrading techniques and methods that could follow up with fast changes in the environment.

In a modern business and intelligence environment characterized by rapid changes and abundant information, it is possible to create the conditions for analyses to contribute to making better decisions and creating new values, only with the appreciation of the increasing importance of the analytical process and the ability of analysts. Organizations that recognize this trend and adapt their business processes and procedures will be in a better position than those who do not accept the possibilities that new technologies bring with them. In a creative atmosphere, talented and motivated analysts, who have good knowledge of the field of analysis and who recognize the needs and expectations of the customers, can, using appropriate techniques, prepare timely and accurate information and high quality forecasts.

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VIRTUAL IDENTITY ON SOCIAL NETWORKS – NEGATIVE ASPECTS

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Abstract: *This paper analyzes the ways in which virtual identity is created on social networks as a form of virtual communities, as well as the problems that accompany such communications. Firstly, the relationships between social networks and virtual culture are presented, as well as the effects of social networks on users. The phenomenon of social networks has almost revolutionized the field of communication. A virtual reality is created which enables, first of all, faster exchange of information, but also satisfaction of a multitude of human needs. Through various forms of virtual communities, people around the world are connecting and networking, and a large number of users directly influence the growth of the popularity of such a community. In doing so, we are able, thanks to virtual identity, to build our "online" personality exactly the way we want, which can positively influence the development of interpersonal relationships, since a virtual personality often helps to solve some social problems, but on the other hand it can take us to another negative extreme.*

Keywords: *virtual identity, communication, social networks, Facebook, negative aspect*

1. INTRODUCTION

The meaning of the concept of communication using a computer can be double analyzed. At first glance, the Internet is a global networked computer worldwide system that has transformed the way communications systems work. Such speed of communication on the Internet has made it possible to access a variety of services, to overcome the great distances and the multicultural nature of the relationships that can arise on this network, which makes modern life considerably easier. However, it is necessary to mention more the other negative side of the medal, which is reflected in the fact that the virtualization of the communication mode minimizes the nature of communication and interpersonal relations are significantly diminished. People easily accept new technological inventions, regardless of negative connotations, so it can be said that human communication technology is moved to a virtual space.

This paper will try to examine the ways in which communication through social networks, and especially Facebook and Instagram as the most popular social networks today, creates the virtual user identity.

First of all will be examined the occurrence of virtual communities or social networks within virtual culture and communication, their development, their particularities, and especially the negative impact of social networks on users.

2. VIRTUAL COMMUNICATION

Virtual communication introduced a lot of novelties into the traditional form of interpersonal communication, especially in the domain of interpersonal and group communication. It brings the possibility of communication people separated in space, real time, the ability to communicate with many, quickly get direct feedback, which traditional media do not have. New media give users many benefits to use, but remember that deficiencies have to be overcome, that is to find a way to avoid the set limits in this type of communication. For every technology that is intended to improve the living conditions it is also believed that it in some way also has a negative impact on life. (Jones, 2001)

Virtual communication is simple and direct. It contains many elements as well as face-to-face communication: more people communicate at the same time, using jargon, changing the topic, taking out the words. They differ exclusively in textual character. Communication through a video call also makes virtual communication, but most of the internet communication is written communication.

Virtual communication is mainly a process of messaging, but in order to get closer to face-to-face communication, it must compensate those functions that are included in that communication, such as expressing emotions through body movements, tone of voice, displaying their own characteristics by arranging their outer appearance and way of dressing and other ways of non-verbal communication.

The fact is that people in virtual communication often behave more freely than in communication live, and the phenomenon of more free behavior in virtual than the "real" reality, known as the "effect of online disinhibition" (Dr. John Suler) is one of the reasons why people are losing their jobs, breaking links and falling into conflicts, although the extent of this effect is probably still not fully understood.

Many consider that virtual communication is suitable for overcoming social anxiety and shyness. They can favor the development of careers, friendly and loving relationships. On the other hand, it can lead to alienation in case of overuse.

2.1. Virtual communities

To be a member of the virtual community, we need to visit it regularly, because the continuity of members keeps the community existing. According to Steven Jones there is another visible difference between physical and virtual communities. Traditional communities impose obligations and rules, while virtual communities function on the principle of voluntariness, and we decide by ourselves to join the community. Various forms of virtual communities can be listed as social networks (so-called social networks), groups, forums, games, blogs, chat rooms. (Jones, 2001)

Chat Rooms or chat were popular before social networking, so they are now outdated. They had their greatest popularity in the period before the development of social networks. This form of virtual communication provided both closed and shy people the opportunity to express their views. The good side of this form of communication is that it gives enough time to come up with and shape our words, and it is allowed to the other side as well. The fact that we do not know the user, we do not know what it looks like, how it behaves and reacts gives us additional courage to open ourselves up and express. The covered information is providing us with the opportunity to be at the same time and what we are like and what we would like to be. (Milinković M, 2015)

Forums as a type of a virtual community are very similar to the chat rooms, but they are created with the goal of covering various topics that are grouped and organized so that the user can easily find what interests him. In forums user can comment, give answers, ask questions and so actively influence the development of the forum, but also just read the topic and passively follow. Users of the forum are allowed to pose problems, so that they can help them in finding a solution, which is quite significant in relieving stress and negative feelings. (Milinković M, 2015)

Blog is one of the forms of a virtual community that is most often used to express different aspects of user creativity. It can also serve as a personal diary where public attitudes, thoughts, desires and ideas are publicly expressed. Bloggers are opposed to traditional media and censorship and have the need to influence the readers and audiences by blogging and thus reach people who are similarly thinking. Readers of these texts of bloggers are also referred to as followers, because they have come to the blog's text by leading their own interests, and are waiting for and following new texts and photos of the author of the blog. Blog keepers in this way become a very faithful audience, which does not easily change the source of information. The disadvantages of using the blog are that the authors are not completely protected and it often happens that their ideas are abused and imitated. (Milinković M, 2015)

Games on the Internet primarily serve as a means of entertainment, but it often happens that their users take so much time to represent another life or virtual lifestyle. The games are made so that virtual communities really resemble communities in the physical world and thus attract as many members as possible. (Milinković M, 2015)

2.1. Virtual identity

Virtual identity is one way we represent ourselves on the Internet in various virtual communities. This identity provides many opportunities to build our online personality the way we want it. We can be tall, blue, black, skinny, we can change the name and show everything we want, and hide everything we do not want, or all the flaws. However, for this reason sometimes there is too much reliance on this imaginary identity, so we forget who we are. For example, a virtual personality often helps to solve the problem of shyness.

Different virtual communities allow each of them to create their own identity in the way we want. For example, on social networks, we can post pictures of events from our lives, we can play games with our identity and experiment in games, while in forums we can freely express think and share experiences with others or demonstrate professional knowledge in some area. Everyone has sometimes wanted to be someone else, and the Internet provides a great deal of opportunities for doing so, with feedback from other people. There is also a bad side of identity hidden, such as not knowing who the person we communicate with, we can not even know if we can trust her. In the period of growing up, creating and finding our own identity acts as a challenge. Modern times and environment in which we live represent very important factors in creating identity while technology and the virtual world mediate in it. This world represents an imaginary figure in a mirror in which friendships can be created, transfer information, organize socializing, contests, discussions. The advantage is that virtual space provides the ability to hide, change identity, anonymity, less control and censorship. These benefits can be at the same time shortcomings, but mostly allow the development of creativity and non-hierarchical communication with everyone. (Milinković, 2015)

There are recent studies that show that virtual identity is shaped and maintained in the real world, because if we belong to a virtual community, then we must respect the rules of its functioning, share the values of the community, participate in community attitudes, etc.

Virtual identity on social networks is a special area of behavior on the Internet, because it is mostly related to the actual personality and does not allow much anonymity and hiding of the real character. This leads to the tendency to idealize ourselves and present ourselves in the best possible light, which can further lead to some beginning of narcissistic behavior. On the other hand, while observing other people who also crave for perfection, we create a fake picture of them and we get the desire to pair them in some way.

3. SOCIAL NETWORKS

Social networks are a website where people talk, exchange ideas or interests, and make new friendships. (Social network, 2017). They have practically become an integral part of our lives. They serve us to entertain, educate and inform. The first modern social network was Friendster, which in a very short time of 3 months attracted a million users. After this social network appeared others, and today they are popular Facebook, Twitter, LinkedIn, Instagram and others.

Social networks consist of various technical elements, and their most important part is the profile on which the contents and lists of friends are edited. Profiles are unique pages where each user can present himself / herself to friends with descriptions such as sex, age, interests, can share images and other multimedia content and applications. Even though social networks encourage true representation, this is not always what users choose. These services allow the individual to self-representation, write comments on the profiles of his friends, share pictures, music, create groups, building up in this way his own identity and socialization that involves communicating with other users through profile.

Some of the most popular social networks related to the appearance of narcissistic behavior are Facebook and Instagram. Facebook was launched in February 2004 in Harvard as some kind of alternative student database and his popularity rose in record time without any commercials. The decisive role in popularizing this social network had email marketing.

The number of users of the Internet and networks on it, and the amount of time users spend on international communication has grown sharply since 2006 when the social networks led by *Facebook* moved to conquering the virtual space at the expense of the physical, the real one. Facebook is soon becoming the reason why many decide to provide themselves with permanent or as frequent as possible access to the Internet.

Users of this social network are able to check their notifications for hours, complement their profile, and check which photos were taken by their friends. It is very important for them to keep up with new developments. For supporters of this social platform, if you have not shared an event from your life on a social network, it's as if it did not happen. In normal communication, people dedicate 30-40% of talk about themselves, and this percentage increases in online communication up to 80%. When we make Facebook profiles, we have unlimited time for self-representation. Mostly those aspects of one's own personality, which we think will be liked by others, are selectively shown. We actually create an ideal image of ourselves, the way we want others to see us. When we look at our own profile, the pupils are expanding, as well as pleasant feelings, which influence the increase in self-confidence. Also, pleasant emotions are causing positive reactions from other people to our posts. With each of the faces of a particular post, photos, services or products, a specific brand, we give information about ourselves. If we were to track all the activities of the average Facebook user, we could make a person's psychological profile. We might be able to meet his needs, interests, value systems, and even some character traits.

In addition to this social network that has become popular and attracted a lot of users recently, it is certainly Instagram. Instagram is specific in that it represents the network and application for publishing user photos. It was founded in 2010 by Mike Krieger and Kevin Systrom as a project first called Burbn. Instagram was created as a combination of the term "instant camera" and "telegram". The essence is photography with mobile phones and a very easy sharing of these pictures with followers. Instagram is an application for creating and sharing photos via the Internet. Users can take photos via Instagram and subject their photos to various modifications (color, contrast, brightness). This application targets individuals who use mobile devices for social exchange; this targeting proved successful - in the first year of its existence, this application had 15 million users (Crnobrnja, 2014).

Instagram won the most popular iPhone app for 2011. Since its release date, Instagram has had around 100 million users worldwide. In 2012, it was bought by Facebook for a billion US dollars.

On the website of Ellecta digital (Đuričić, 2017) data are given that in the third quarter of 2015 in Serbia there were 360,000 open accounts on Instagram, and today there are about 1,200,000. Instagram is more commonly used by women (around 650,000) than men (about 560,000). When talking about location, Instagram is the most popular in Belgrade with 460,000 users.

4. NEGATIVE ASPECTS

In addition to the positive effects that social networks have on reducing loneliness, encouraging prosocial behavior, shared thoughts and interests, one should also point out those bad sides, because each social network can be viewed as a sword with two blades. Using social networks encourages mental activity, but at the same time it reduces time for socializing, sports and physical activities in nature and the like. Nothing can replace the live contact, the specific atmosphere, and the energy exchange in "non-electronic" communication.

The list of negative aspects is long and there are problems with the protection and theft of data, child abuse, the occurrence of addiction and alienation from the real world and people, the lack of censorship, the lack of technical support, the formation of user groups that support socially disastrous ideas and organizations or accelerate socially harmful behavior.

The magazine "Time" cites research findings that linked the use of Instagram with high levels of anxiety, depression, violence and fear of missing out. (Macmillan, 2017) Research has previously claimed that young people who spend more than two hours a day on social networks often report psychological problems. Royal Society for Public Health and Young Health Movement conducted a survey in the UK in early 2017. On a sample of 1,500 young people aged 14-24, they were researching the use of social networks. Respondents were asked how a social network affects 14 health-related items, including anxiety, depression, loneliness, sleep, online abuse, and so on (Macmillan, 2017). The results have shown that Instagram is the network that has the greatest negative impact on the mental health of young people, as it disturbs the perception of the body, increases the fear of leakage and has a detrimental effect on the dream. Second place was Snapchat, and third place went to Facebook. This does not mean, however, that Instagram is necessarily a negative social network. It has its positive sides, such as creative expression, identity, self-awareness and community (Macmillan, 2017).

A virtual environment allows a wide range of identity manipulation, in many cases it is about its complete distortion. As a special category should separate identity theft, which aims to dispose of the monetary and other material goods of the person whose identity is stolen.

In social networks the users privacy is the most drastic, most concrete, and most often violated. It runs through segments of which the user and application (technical) aspect is the most concrete. The most common users themselves place certain personal information, data and material that belongs to the private domain, and then share them with other users. In this way, they unconsciously and directly allow violation of their privacy, because they allow their personal data to be abused both by other users and by the social network itself (Đ. Klipa, R. Dragović).

In any case, privacy on social networks is certainly relativized whether by the users themselves who voluntarily provide certain information about themselves (access and use of the social network), or by the social network itself (collecting and filtering, and segmenting user data for targeted marketing campaigns).

There are several thousand organizations on the Internet dealing with some of the many ways of using children. A large number of these organizations are legally registered companies, humanitarian or non-governmental organizations with real legal identity. Their representation in the public unambiguously points to the services for providing various types of assistance, starting with humanitarian, material donations, through psychological assistance to endangered groups (children of divorced parents, children with poor material and social status, etc.), to business deals with good and secure earnings. However, under the "colorful mantle" of tempting opportunities for a better life, the goals of trafficking, prostitution, various types of theft and other ways of exploiting the victims are most often hidden. On the other hand, there are anonymous sites behind criminal groups that act completely illegally, while in the third group there are individuals (psychiatric cases) who have direct access to the victim in order to achieve their goals, of which sexual abuse in the first place. The common trait of such "hunters" is their incredibly "honest" performance, full of emotion, understanding and compassion for the potential victim.

We will also mention a broader negative aspect as many people use networks to find the news and information and thus complement and shape their political identities and behaviors. In such a way, they become a suitable ground for manipulation and misleading, because the quality of such information can not

be spoken in a positive light since social networks wanted it or not to become a site of sophisticated ways of political action.

Communication on the Internet also has a share in the reconstruction of cult and linguistic identity, both collective and individual (Tubella, 2004). The cultural model that reach us with the help of the Internet is the most natural of those from the English-speaking world, just as it did with other media: movies, music, television, video games over the last century (although only 29% of interactions on Internet is in English (Castells M, 2010). English language, the speed of communication on the Internet and the new conventions in expression, have a synergistic influence on the quality of the Serbian language, which we meet not only in communication through social networks, but also in emails, letters and everyday speech.

5. CONCLUSION

The personal characteristics and their development through social networks can be followed because the personality is a unique system of particular behavior. The personality itself over time is influenced by many factors as biologically, sociologically, and with the development of technologies today, a significant influence has a factor of socialization on social networks. The organization of emotional and cognitive characteristics represents the identity of a person who is characterized by attitudes, motives, needs and behavior, and which is relatively unchanged. The identity of a person in his/her real world can be quite different from the virtual identity, or the way people present themselves in virtual communication. To have a virtual identity and to use a social network means to have advantages for the education and personal development, however should be careful and keep a real image of themselves. It should be found the measures that social networks will look at so as to interest people for the useful things they offer and reduce the audience that encourages narcissistic behavior.

Young generations as the most serious users of social networks and the Internet in general growing up with modern technologies are losing in the field of learning the social skills they need in real life. They find it difficult to deal with life situations when they need to be quickly reacted, and when they can not imagine the right answer hidden behind the computer, which requires a real life experience.

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THE EFFICIENCY OF HIGHER EDUCATION STUDENT MOBILITY PROGRAMMES IN EUROPE IN 2015.

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Abstract: *Student mobility has become an important policy instrument in the higher education and it is essential for students' development and development of higher education in general. The success of mobility leads to increased quality of education and the cooperation between institutions and countries. Therefore, it is crucial for countries to maintain the high number of students enrolled in mobility programmes in order to be efficient and successful from the aspect of student mobility. Data Envelopment Analysis (DEA), nonparametric method, is a very convenient tool for determining the efficiency rate. The ease with which DEA can handle multiple inputs and multiple outputs makes it an attractive choice of technique for measuring the efficiency of this problem. (Johnes, 2006). Therefore, in this paper, DEA models evaluate the efficiency rate of European countries from the aspect of student mobility programmes in year 2015. The study was conducted through two scenarios. The first scenario tells us more about the efficiency of higher education in Europe in generally, not only about the efficiency of student mobility, whereas the second scenario is focused completely on the efficiency of student mobility programme. Based on the results, this analysis determines which countries in Europe are efficient and which are not. For inefficient countries, comparing them to the efficient ones, DEA is giving us an information about what is each country required to do in order to become efficient. Based on the results, we can conclude that all the efficient countries are countries with high level of GDP and high number of students enrolled in mobility programmes. Countries that have higher percentage of mobile students, comparing to the number of students enrolled in tertiary education and the size of country, are the most efficient as well.*

Keywords: *Data Envelopment Analysis, efficiency, student mobility programmes, European countries, higher education.*

1. INTRODUCTION

Cross-border mobility among students is a key instrument in favouring peace between European countries: discovering that they share a common culture, common values, and, despite a history of wars and conflicts, knowing that they have much to gain by building a cooperative future together. For this reason, at least, cross-border mobility among students is politically desirable (Gérard and Sanna, 2017). Student mobility programmes are important for both students that are enrolled in the programmes, and for the countries and institutions that are sending and receiving students through mobility programmes. Student mobility has a positive impact on student's personal and professional development. Universities become more competitive and therefore the quality of studying increases.

DEA began as a new management science tool used for technical efficiency analysis of non-profit sector decision-making units (DMU). It is a linear programming model and specially designed technique used for evaluating relative performance of homogeneous DMUs where there is no known relationship between the transformation of inputs used by an organizational unit and the outputs that it would produce (Taylor and Harris, 2004). The efficiency frontier is therefore not known, but it can be estimated by using data on the actual performance of the DMUs under consideration, in terms of the outputs that they produce for the level of inputs that they use. The essential characteristic of DEA is the transformation of the multiple-input, multiple-output DMU into a single "virtual output" value for all DMUs. The ratio of this single virtual input to virtual output provides a measure of technical efficiency (Fernando & Cabanda, 2007). That ratio must not exceed the range from 0 to 1.

Student mobility was described in the first part of this paper, as well as its benefits. After introduction of student mobility programmes, the concept of efficiency and Data Envelopment Analysis is being described in the second part. In the third part of this paper, the efficiency analysis of student mobility programmes in Europe in 2015 is conducted and its results are being presented. And finally, the fourth part of this paper gives us the conclusions and closing discussion.

2. INTERNATIONAL STUDENT MOBILITY

Mobility has always been the objective of the Bologna Process, and it is a key instrument in developing the European Higher Education Area. Mobility of students and academic and administrative staff is seen as crucial for academic and cultural as well as political, social and economic spheres (Communiqué, 2003). In the Bologna process agreement, mobility of at least 20% of higher-level educated students is targeted by year 2020 (Barr et.al., 2009; Gvetadze, 2014).

UNESCO Institute for Statistics defines international (or internationally mobile) student as a student who has crossed a national or territorial border for the purpose of education and is now enrolled outside their country of origin (<http://uis.unesco.org/en/glossary-term/international-or-internationally-mobile-students>).

Student mobility programmes have been designed in order to provide students support in their education and professional development through opportunity to study in a new, international environment. Student mobility, especially studying abroad, is particularly important for student's personal development. It offers a unique opportunity to each candidate to gain new experience, to learn foreign language and develop interpersonal skills in a new and culturally diverse environment. Therefore, one of the most valuable results of mobility programmes is the increased number of young professionals who can make a positive impact on their local environment, thanks to their exposure to wider experiences through studying abroad (Đokvučić et.al., 2014). Other than new knowledge, students develop an ability to adapt to a different culture, they learn of cooperation and exchange experiences; they become more competitive on the market, get better wages, better social status and reduce chance of unemployment. Besides the students, both countries and institutions that are enrolled in mobility programmes also benefit from these programmes. Student mobility increases competition between universities through pressure for better and more courses in foreign languages, and more generally, pressure from more demanding students for improved quality of studies. It also contributes labor mobility and supports research and innovations (Gérard and Sanna, 2017).

There are various student mobility programmes in Europe, among which are the programmes Erasmus+, CEEPUS and summer school programmes. Students are able to choose the programme and type of their mobility that determines the duration of the programme (2-3 weeks, one semester or a full academic year). One of the main criteria for students in choosing countries of destination is the availability of studies in English or other popular European languages, such as German, French or Spanish (Gvetadze, 2014).

One of the indicators of student mobility programmes success is increased number of realized mobilities. Therefore, it is of a great importance to constantly work on improving the quality of programme and on increasing the number of students enrolled in programme. The key of increasing that number is in adequate promotion. Both receiving and sending countries and institutions must have different approaches in trying to reach the greater audience and raise the popularity of programmes.

It is vital that students know, before their exchange programme starts, that their study period and results will be recognized when they get back to their home institutions (https://www.uns.ac.rs/images/doc/medjunarodna/UNS_Guide_for_Mobility_Officers.pdf). The purpose of the Learning Agreement is to provide a transparent and efficient preparation of the exchange to make sure the student receives recognition for the activities successfully completed abroad and must be approved by the student, the sending and the receiving institution, organization or enterprise before the start of the exchange. (https://ec.europa.eu/programmes/erasmus-plus/resources/documents/applicants/learning-agreement_en).

3. DATA ENVELOPMENT ANALYSIS

Data Envelopment Analysis is specially designed nonparametric technique used for measuring the efficiency of complex entities with diverse inputs and outputs. (Charnes et.al., 1978). It is a linear programming model used to measure technical efficiency. Efficient units are those that:

- produce a certain amount of or more outputs while spending a given amount of inputs, or
- use the same amount of or less inputs to produce a given amount of outputs, as compared with other units in the population (Vincová, 2005).

Using the results of this analysis, we can determine how much is each decision-making unit inefficient comparing to units that are efficient. It also gives us an information on how much each unit must reduce its inputs and increase its outputs in order to become efficient unit. DEA determines the efficiency rate of each DMU, in the population of n decision-making units. Each unit produces s outputs, while consuming m inputs.

In that case, we can write an input matrix:

$$X = [x_{ij}, i = 1, 2, \dots, m; j = 1, 2, \dots, k \dots, n], \quad (1)$$

and output matrix:

$$Y = [y_{rj}, r = 1, 2, \dots, s; j = 1, 2, \dots, k \dots, n], \quad (2)$$

where x_{ij} represents the amount of i -th input of DMU _{j} , and y_{rj} the amount of r -th output of DMU _{j} . For k -th unit, X_k and Y_k shows the quantified inputs/outputs of unit DMU _{k} . The efficiency rate of such a unit can then be generally expressed as (Vincová, 2005):

$$\frac{\text{weighted sum of outputs}}{\text{weighted sum of inputs}} = \frac{\sum_{r=1}^s u_r y_{rk}}{\sum_{i=1}^m v_i x_{ik}} \quad (3)$$

Before conducting the analysis, it is crucial to determine the orientation of model that will be used. There is input and output orientation of DEA models. In purpose of this study, output-oriented DEA model will be used in order to determine the efficiency rate of each country, with constant returns-to-scale (CRS). Output-orientation is being used simply because the aim is to maximize the number of students enrolled in mobility programmes (outputs) with given amount of inputs. Model used in this study is the following:

$$\begin{aligned} \min h_k &= \sum_{i=1}^m v_i x_{ik} \\ &st \\ &\sum_{r=1}^s u_r y_{rk} = 1 \\ &\sum_{i=1}^m v_i x_{ij} - \sum_{r=1}^s u_r y_{rj} \geq 0; j = 1, 2, \dots, k \dots, n \\ &v_i \geq \varepsilon; i = 1, 2, \dots, m \\ &u_r \geq \varepsilon; r = 1, 2, \dots, s \end{aligned} \quad (4)$$

where:

- $v_i, i = 1, 2, \dots, m$, are weights assigned to i -th input,
- $u_r, r = 1, 2, \dots, s$, are weights assigned to r -th output and
- h_k is relative efficiency rate of DMU _{k} .

Model above is called primary CCR model. It is more often that the number of units is much greater than number of inputs and outputs. Because of that, in practice, dual model is more commonly used. The dual model can be stated as follows:

$$\begin{aligned} \max Z_k + \varepsilon \left(\sum_{r=1}^s s_r^+ + \sum_{i=1}^m s_i^- \right) \\ &st \\ &\sum_{j=1}^n \lambda_j x_{ij} + s_i^- = x_{ik}; i = 1, 2, \dots, m \\ &-Z_k y_{rk} - \sum_{j=1}^n \lambda_j y_{rj} + s_r^+ = 0; r = 1, 2, \dots, s \\ &\lambda_j \geq 0; j = 1, 2, \dots, n, s_r^+ \geq 0; r = 1, 2, \dots, s, s_i^- \geq 0; i = 1, 2, \dots, m. \end{aligned} \quad (5)$$

where $\lambda = (\lambda_1, \lambda_2, \dots, \lambda_n), \lambda \geq 0$ is a vector assigned to individual productive units, and s_r^+ and s_i^- are variables that show how much each individual unit must increase its outputs and reduce its inputs in order to become efficient unit. The variable Z_k indicates the need for increased output to achieve efficiency (Vincová, 2005).

DEA provides us information about units that are efficient and those that are not. However, this analysis also tells us what is it that each inefficient unit must do in order to become efficient. Variables s_r^+ and s_i^- are used for calculating target values: values of parameters that each inefficient DMU must achieve in favor of becoming efficient. Those values are possible to determine using equations (6):

$$X_k^* = X_k - s^-, \quad Y_k^* = Z_k Y_k + s^+ \quad (6)$$

where X_k^* and Y_k^* are vectors of target values of input and output parameters for DMU _{k} . (Savić, 2012).

4. EMPIRICAL STUDY

The main objective of this study was to determine which country in Europe is efficient from the aspect of student mobility programmes. DMUs in analysis are members of European Union (EU-28) and partnered countries (Table 3).

The parameters used for analysis are shown in Table 1.

Table 1: The parameters used for efficiency analysis of European countries from the aspect of student mobility

Inputs	Scenario 1	Scenario 2
	<ul style="list-style-type: none"> ▪ GDP per capita [\$] ▪ Expenditure on tertiary education, as % of GDP ▪ Population 	<ul style="list-style-type: none"> ▪ GDP per capita [\$] - I_1 ▪ Expenditure on tertiary education, as % of GDP - I_2 ▪ Population - I_3 ▪ Number of students enrolled in tertiary education - I_4
Outputs		
	<ul style="list-style-type: none"> ▪ Number of students enrolled in tertiary education ▪ Number of incoming mobilities ▪ Number of outgoing mobilities 	<ul style="list-style-type: none"> ▪ Number of incoming mobilities - O_1 ▪ Number of outgoing mobilities - O_2

As seen in table 1, there are two scenarios of efficiency analysis of European countries from the aspect of student mobility. The only difference is that the parameter “number of students enrolled in tertiary education” is input into the model in the first scenario, and output from the model in the second scenario. The first scenario can be used to show us the efficiency of higher education in Europe in generally, not only the efficiency of student mobility, whereas the second scenario is focused completely on the efficiency of student mobility programme. The purpose of these two scenarios is to see how the change in parameters and the number of students enrolled in tertiary education, as an input, affects the efficiency of European countries.

The model used for the purpose of this study is output-oriented DEA model, since the goal is to increase the number of student of mobilities in Europe. The analysis is conducted using EMS software (Efficiency measurement system).

4.1. Analysis and results

Descriptive statistics of values parameters used in the analysis and correlation analysis are shown in table 2 and table 3. The tables for descriptive statistics and correlation analysis are the same for both scenarios.

Table 2: Descriptive statistics

	I_1	I_2	I_3	I_4	O_1	O_2
Mean	32,494.25	1.27	17,867,903.72	804,333.81	53,549.95	22,374.55
St. error	4,220.93	0.08	4,184,938.98	221,830.60	15,823.87	5,176.31
Median	24,453.35	1.27	7,544,249.50	305,103.50	22,390.00	9,555.50
Mode	-	-	-	-	821.00	-
St. dev.	23,877.19	0.43	23,673,589.88	1,254,863.35	89,513.33	29,281.66
Variance	570,120,219	0.18	560,438,857,799,473	1,574,682,017,701	8,012,636,685	857,415,417
Kurtosis	0.99	-0.07	1.15	9.42	10.40	5.38
Skewness	1.08	0.46	1.57	2.81	3.07	2.17
Range	99,631.97	1.80	82,138,104.00	6,055,990.00	430,012.00	129,075.00
Minimum	1,818.00	0.52	299,891.00	6,896.00	821.00	54.00
Maximum	101,449.97	2.32	82,437,995.00	6,062,886.00	430,833.00	129,129.00
Sum	1,039,816.11	40.76	571,772,919.00	25,738,682.00	1,713,598.35	715,985.50
Count	32	32	32	32	32	32

Table 3: Correlation analysis

Parameters	GDP per capita [\$]	Expenditure on education (% of GDP)	Population	Number of students enrolled in tertiary education	Number of incoming mobilities	Number of outgoing mobilities
I1	1.000					
I2	0.290	1.000				
I3	-0.085	-0.081	1.000			
I4	-0.127	0.058	0.886	1.000		
O1	0.134	0.050	0.758	0.558	1.000	
O2	0.182	0.097	0.681	0.441	0.915	1.000

Based on results of correlation analysis, we can see that population and number of students enrolled in tertiary education positively affects number of students enrolled in mobility programmes.

Table 4 presents the results of the efficiency analysis for both scenarios.

Table 4: Efficiency analysis of student mobility in Europe

Scenario 1			Scenario 2		
DMU	Efficiency rate	Rank	DMU	Efficiency rate	Rank
Turkey	19.97%	1	Luxembourg	34.58%	1
Finland	45.29%	2	United Kingdom	48.82%	2
United Kingdom	48.82%	3	Austria	59.59%	3
Austria	59.59%	4	Finland	72.24%	4
Czech Republic	92.20%	5	Czech Republic	88.06%	5
Poland	93.76%	6	Switzerland	97.31%	6
Germany	103.14%	7	Poland	102.14%	7
Netherlands	112.04%	8	Cyprus	111.68%	8
Italy	114.54%	9	Turkey	122.95%	9
Switzerland	117.90%	10	Germany	126.38%	10
Luxembourg	121.40%	11	Netherlands	136.97%	11
Belgium	121.50%	12	Denmark	138.19%	12
France	124.92%	13	Belgium	144.50%	13
Denmark	124.94%	14	France	147.06%	14
Latvia	128.68%	15	Latvia	147.31%	15
Serbia	149.85%	16	Serbia	161.62%	16
Iceland	153.06%	17	Iceland	170.68%	17
Spain	157.40%	18	Romania	177.01%	18
Romania	173.36%	19	Italy	185.86%	19
Sweden	174.41%	20	Hungary	186.23%	20
Hungary	175.02%	21	Slovakia	223.48%	21
Ireland	177.00%	22	Ireland	230.60%	22
Bulgaria	180.14%	23	Bulgaria	254.91%	23
Norway	190.07%	24	Sweden	266.67%	24
Cyprus	198.07%	25	Malta	330.55%	25
Slovakia	200.53%	26	Estonia	332.86%	26
Lithuania	216.64%	27	Spain	333.38%	27
Portugal	235.00%	28	Portugal	370.90%	28
Croatia	248.44%	29	Norway	409.47%	29
Slovenia	256.84%	30	Lithuania	493.12%	30
Estonia	267.92%	31	Slovenia	526.25%	31
Malta	358.61%	32	Croatia	2935.24%	32

According to the results of analysis in first scenario, where number of students enrolled in tertiary education is output from model, we can see that the most efficient country is Turkey. DMU that produces big amount of outputs while consuming small amount of inputs is considered to be efficient. Turkey, as a country with amount of inputs, comparing to other countries, has a high number of students enrolled in tertiary education and therefore is most efficient. Comparing Czech Republic to Portugal, as countries with similar GDP per capita, expenditure on education and population, Czech Republic has a much greater number of students enrolled in mobility programmes than Portugal, thus is more efficient.

The results of analysis in second scenario is slightly different. Moving the number of students enrolled in tertiary education in 2015. from outputs to inputs affected some of the countries' efficiency rate. In the case of second scenario, Luxembourg and Switzerland (inefficient in first scenario) became efficient countries from the aspect of student mobility programmes, while Turkey and Poland are now inefficient. The reason why Turkey became inefficient, as a most efficient country in the first scenario, is because of the same reason it was efficient in the first one. Great number of students enrolled in tertiary education is now input in the model and thus it makes Turkey inefficient because it produces small amount of outputs with high number of inputs. Luxembourg becomes the most efficient because it is a really small country, but comparing to other countries, it has a great number of students enrolled in mobility programs for its size.

5. CONCLUSION

According to data published by UNESCO Institute for Statistics and Eurostat, and reports made by European Commission, the popularity of student mobility programmes is increasing each year. Both students and countries are aware of the benefits that those programmes carry. Comparing data of implementation of the programme Erasmus+ in 2014, first year of implementation of this programme, and in year 2015, we can see that the number of students enrolled is 4% greater. The first two years of the programme Erasmus+ are used for the purpose of evaluating the success of this programme at the beginning of its realization. This paper evaluates the efficiency of European countries from the aspect of student mobility programmes in year 2015. Although the research was conducted in year 2018, the data from year 2015. is being used because of unavailability of updated data in 2018. The most updated data for expenditure on higher education, for most of the countries, dates from year 2014, which can be used for analysis in year 2015, but not in the present.

In the analysis that was done in this paper, it is obvious that the most popular countries are Austria, Czech Republic, Finland, United Kingdom, countries efficient in both scenarios and Luxembourg, Poland, Switzerland and Turkey, countries that are efficient depending on the scenario. Using DEA, it was determined which countries are efficient. For other countries, that are inefficient, DEA calculates target values that indicates how much each country must increase its outputs - students enrolled in mobility programmes (and students enrolled in tertiary education, in the case of first scenario) in order to become efficient. For those countries, it is important to invest more in promoting student mobility programmes to their students, in order to increase the number of their students enrolled in the programme. Also, the adequate promotion of one country and its universities in other countries is equally, if not more important, for increasing number of students that are coming to that country in purpose of studying.

This study can be a significant contribute to improving the student mobility programmes in Europe considering that there hasn't been any paper published yet that uses DEA for the purpose of measuring the efficiency of European countries from the aspect of student mobility.

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DISPARITIES AMONG YOUTH LABOUR IN SERBIA

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Abstract: *It is evident that the unemployment rate among young people in Serbia is much higher than in developed countries. The latest statistical data have shown that about 32 % of young people aged from 15 to 24 are unemployed or work in the field of the grey economy which is by 15 percentage points higher than the average of the youth unemployment rate in EU countries. Furthermore, Serbia has been facing youth labour disparities indicating more chances of entering the labour market for the male population than female. The reasons for this could be various. The paper includes data of the Labour Market Survey 2017 that was conducted by the Statistical Office of Serbia, and descriptive statistics results in order to explain the main reason for disparities within the youth labour market in Serbia. It is also important to emphasize that respectable insight into youth labour market as well as results of the research, will provide a significant contribution to unemployment problem-solving in Serbia.*

Keywords: *Labour Market; Youth; Gender inequality; Disparities.*

1. INTRODUCTION

Although the Republic of Serbia has an obligation to provide better future for its young citizens, it has been obvious so far, that the Government has been facing a large number of issues within the youth labour market. According to statistical data from 2016, the youth unemployment rate was almost twice as high as the average unemployment rate of young people in EU countries (18%) (ILO, 2016). The women unemployment rate (aged from 15 to 24) is by seven percentage points higher than the men youth unemployment rate (Statistical Office of the Republic of Serbia, 2017).

However, the issue of employment among young people aged from 15 to 24, as well as the young population aged from 25 to 29, had excited in the Republic of Serbia even before the outbreak of the financial crisis in 2008. Accordingly, since 2007 the Ministry of Youth and Sports, at the initiative of the Government, has started to take some actions to improve the employment of young people (Pavlovic, Djukic, and Bodroza, 2017).

One of the current Strategies dealing with this issue is the National Youth Strategy. It was adopted in 2015, and since then it has been focused on young people within on and outside the labour market (aged from 15 to 30). The strategy points out that Serbia faces various issues such as young people leaving their country (males especially, which additionally impacts gender inequalities in the labour market), decline in the number of young people in the general population, high unemployment rate among young people as well as gender inequalities (Youth National Strategy, Ministry of Youth and Sports, 2017).

During the last few decades, a group of researchers has been trying to determine the reasons why young people in Serbia are significantly late in various aspects of their lives such as completing their education, leaving the parental home or finding permanent employment, comparing to the same indicators in developed European countries such as the Netherlands, Germany, and Denmark (Tomanovic and Ignjatovic, 2004). Most of young people in Serbia leave their parental home in their late 30s, and they are supported by their parents (93.3%), which is an important indicator that they definitely enter the labour market late. Furthermore, it is important to mention that some of them are beneficiaries of scholarships and student loans (Mrdja, 2011; Todorovic et al., 2016).

Besides the fact that the youngsters in Serbia start their families very late, it is also evident that many of male population look for their life and job opportunities abroad. On the other hand, the statistics show that a more significant share of females decides to deal with household and motherhood, which directly affects gender inequalities within the labour market (SILK, Statistical Office of the Republic of Serbia, 2004). Although the role of women has increased considerably in the education sector, during the last few decades, the number of women with a high level of education is higher than the number of men, especially in the countries of southern and south-eastern Europe. However, there is still a patriarchal stereotype, where men are in charge of the finances in the family (Beveridge and Velluti, 2016). According to the Kabeer and Natali

(2013), there is evidence that reducing inequality in education and raising the average level of education among women contribute to their better economic performance, as it was indicated by GDP per capita.

The issue of gender inequality was also recognized by the UN. Therefore, the UN adopted the Agenda 2030 for Sustainable Development (UN, 2015), dedicating a special attention to gender equality goal. Also, regarding this issue, the Republic of Serbia has been using the National Youth Strategy to reduce inequality between young male and female.

In this paper, we analyzed the core indicators which have profoundly influenced the issue of gender inequality in Serbia. The indicators that are carefully considered are the following:

- education
- wages
- regional differences
- demographic indicators

Data analysis is presented throughout descriptive statistics. The research results will be useful in the making of adequate strategies within the youth labour market, as well as in further researching within the field of youth labour market and solving gender inequalities in Serbia and other countries in the region that are facing the same problem.

The first part of the paper presents the subject of the study and the reasons why we focused primarily on the gender inequalities within the labour market. Moreover, the second part of the paper provides an overview of previous research, followed by an overview of the youth labour market and gender inequality. The fourth part of the paper covers the discussion, and finally, conclusions are presented by a review of labour market differences among men and women.

2. LITERATURE REVIEW

The idea of feminism and inequalities among women and men appeared for the first time in the 19th century, more precisely, after the end of the Second World War. Women started to fight for their social equality and received huge support by decision makers at the international level. According to this, UN Secretary-General suggested that “investing in women is not only the right thing” but also “the smart thing to do” (Kabeer and Natali, 2013). Since the 1960s, as a result of growing interest in the issue of inequality within the labour market, there has been a significant increase in a number of women involved in science and education as well. This fact gave rise to the development of new research field.

Firstly, women started to be a part of national economics because that was the win-win scenario. Moreover, gender inequality seemed to support economic growth and macroeconomic performance. This was evident in the research carried out by Seguino (2000), who analyzed how gender wage gaps can boost international competitiveness when women are disproportionately employed within labour-intensive export-oriented industries.

In the 1960s, neoclassical theory sought for the reasons of the participation of women within the labour market. Thus, Mincer (1962) implied that the presence of women in the labour market contributed to an increase in family income. Several years after Mincer's theory, the number of women in organizations increased. Moreover, the concern for gender equality gained ground across a wide range of organizations (state, bilateral and multilateral). The achievements of research, in the field of gender inequalities, as well as the impact of education and earnings on the employment of young men and women, led to the development of a large number of theories, such as the theory of capital and the expansion of institutional labour economics (Edwards et al, 1973), segmentation theory (Beneira 2003), etc. Institutionalists studied historical and contemporary segregation, segmentation and discrimination within the labour market and criticized the model of a competitive labour market. However, none of these theories and achievements answered the question why segmentation was present, only analyzed the position of women within the labour market.

A specific group of researchers was analysing over the time the factors that influenced the employment of women, as well as the differences in wages and race, ethnicity and sexuality, gender discrimination and segregation (Power, Rosenberg 1995; Rubery 2005; Strober, 1984; Rubery et al, 2006; Pavlovic et al., 2017).

Furthermore, women successfully occupied their positions within the labour market, in a way that some professions are only common for women such as public relations, systems analysis, bartending, advertising

and insurance, depending on country of origin. For instance, women in Europe and North America have recently been involved in nursing, primary teaching, hairdressing and other 'beauty work,' as well as various manufacturing (Bradley, 1989). Men are more represented in occupations such as jobs related to mining, driving, professional catering, plumbing and car sales. The researchers indicate this phenomenon as "job segregation by sex" or "sexual work segregation" (Wharton, 2012).

3. YOUTH LABOUR MARKET AND GENDER INEQUALITY IN SERBIA

Labour market of the Republic of Serbia has recorded a significantly low rate of women employment. Statistical data from 2016 displayed that the women employment rate was 38,1% which is almost 14,7 p.p less that men employment rate. The employment rate among women within the age box from 25 to 54 is by 11 p.p. less than the employment rate among men within the same age box.

The figure 1 indicates that the women unemployment rate within the age box from 15 to 24 is extremely high. The unemployment rate reached the pick in 2014 with 50% which means that half of young women population couldn't have found the job. However, in the following period, the statistical data imply that the young women unemployment sharply dropped to 36, 3% in 2017. At the same time, the young men unemployment rate (29, 2%) is slightly lower than young women unemployment rate. Moreover, the women inactivity rate is by 6, two p.p. higher than men inactivity rate (63, 2 % and 69, 4% respectively).

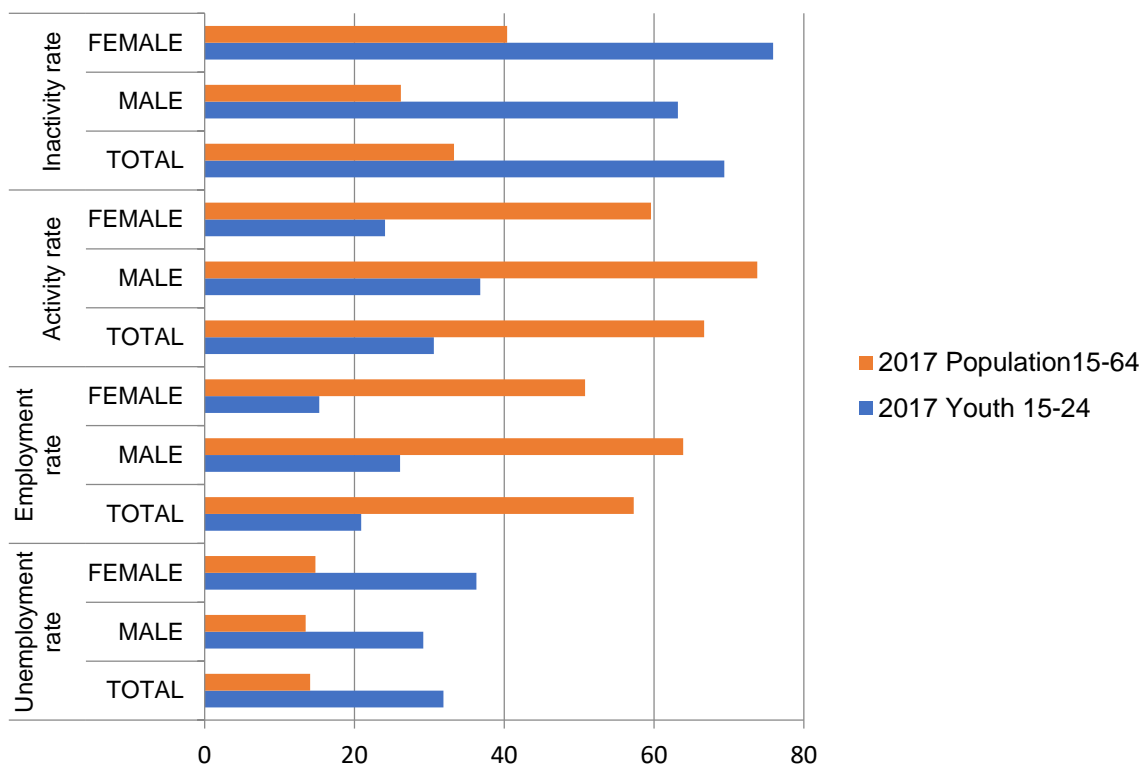


Figure 1. Labour Market in Serbia, 2017.

Source: Statistical Office of Republic of Serbia, 2017.

Considering the region, the worst women position at the labour market is evident in the region of South and East Serbia (43,6%), while the best position is in the region of Vojvodina (28%).

Comparing to the men unemployment rate aged from 15 to 24, the lowest rate is evident in Vojvodina (30%), while in the Belgrade region is 33,9%, in Sumadija and central Serbia is 33,8%, as well as East and South Serbia is 33,6% (Statistical Office of Serbia, 2016).

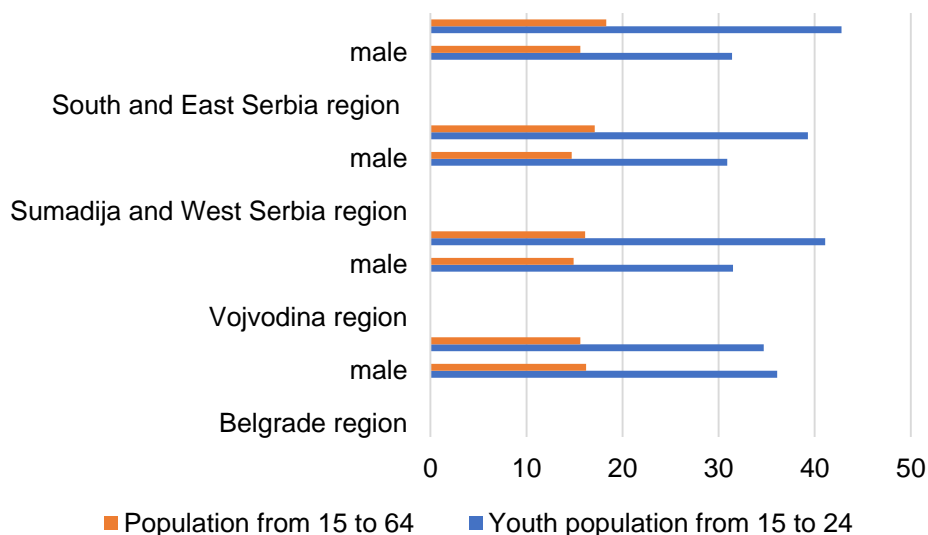


Figure 2. Unemployment rate Serbia, 2017.

Source: Statistical Office of Republic of Serbia, 2017.

On the other hand, the women inactivity rate is much higher than the men inactivity rate. According to Statistical Office of the Republic of Serbia (2016), the women inactivity rate was 41,6% comparing to the men inactivity rate of only 26,9%.

If we take in consideration the women inactivity group according to the age, it can be noticed that the highest inactivity rate refers to the age groups over 55 (81,2%) as well as from 15 to 24 (76,7%). Furthermore, the lowest inactivity rate among women aged from 25 to 54 is 23,9% while the men inactivity rate is 12,3% at the same age.

Table 1. Inactivity rate in Serbia, 2017

INACTIVITY RATE 2017			
AGE	TOTAL	FEMALE	MALE
15+	46, 7	54, 6	38, 2
15-64	34, 4	41, 9	26, 9
15-24	69, 7	76, 6	63, 2
25-54	18, 0	23, 9	12, 3
55+	73, 4	81, 3	63, 6

Source: Statistical Office of Serbia, 2017.

4. DISCUSSION

Investment in the youth should be more strategically planned because they are the creators of our future. Numerous scientists were aware of the inappropriate position of young people of Serbia at the labor market (Obradovic and Pavlovic, 2015; Gorry, 2013; Flinn, 2006). By analyzing various factors, it can be concluded that different indicators influence on youth employment (Gorry, 2013; Zubovic, Zdravkovic and Pavlovic, 2015; Kelly and McGuinness, 2015) in that way additionally slowing down the employment of young women.

The reasons for the unfavorable position of young people in the labour market are many. A large number of economists believe that the financial crisis caused a considerable lack of available jobs, influenced the level of earnings, and on the other hand created a disagreement between supply and demand in the labour market, etc. (Arandarenko, 2011). On the other hand, some researchers believe that the unemployment rate was high and before the crisis (Vasile, 2012).

On the other hand, the number of population is in decline, and consequently, demographic trends significantly influence the labour market, and more precisely, the youth market. According to the 2011 census, the share of young people is 18% (considering young people aged from 15 to 29), while according to the 2002 census, the share of young people accounted for 20%, which means that the young population in

Serbia is reducing. Serbia does not belong to countries with a high percentage of young people. Out of the total population, young people aged from 15-24 account for 11.7%. Taking into account a group of young people up to 30 years old, the most significant share of young people is aged from 25 to 29 (480,286). The most substantial number of young people lives in the north of Serbia (413,765), while 183 848 young people aged between 15 and 24 live in the south of Serbia (Census, Statistical Office of Republic of Serbia, 2011). Observing the population according to the gender structure, out of the total population in the Republic of Serbia, there are 3,499,176 males and 3,687,686 females, more precisely 51% of the total are women. Considering the last two Censuses, the women age rate has been decreasing from 50,8 to 49,5 as well as the men age rate from 45,3 to 43,1. Additionally, regarding the age, there are women within the old and middle age group and more men within the young age group.

In the last few years, due to the unstable political situation in the region, youth dissatisfaction is mostly present, and young people are leaving their country of birth. The Statistical Office of the Republic of Serbia announced that in the period from 1991 to 2001, about half a million young people, predominantly males, looked for a better future abroad. Furthermore, the highest trend of population movements is from the south of Serbia, where according to the 2011 population census, about 1,563,916 inhabitants live, while the most populated region is the South and East Serbia with 2,031,697 inhabitants.

Education significantly influences the employment of young women and men and education had the main impact on finding a job (Buha et al., 2014; Devjak and Devjak, 2009; Pavlovic et al., 2016). Research shows that education provides better jobs and higher earnings (Flinn, 2006; Heckman, Lechner and Taber, 1998), and on the other hand reduces chances for poverty. According to the SILK Survey (2014), out of 100 highly educated people, only one is poor. More recently, the statistical data shows that women attend faculties more than men (women attendance 56%/ men attendance 44%) (Table 1).

Table 2. Enrolled students at Faculties in Serbia

YEAR	TOTAL MALE	TOTAL FEMALE	% MALE	% FEMALE
2011	102441	129220	44	56
2012	105518	133427	44	56
2013	108400	134448	45	55
2014	106594	134460	44	56
2015	112191	138971	45	55
2016	115190	146899	44	56

Source: Statistical Office of Republic of Serbia, 2016.

Out of the total number of employees, there are more women who have completed a high degree of education. Therefore, out of the total number of employees with a high level of education, about 326 thousand are women, while 281.5 thousand are men. The most substantial amount of male population completed the secondary degree of education. According to the statistical data from 2016, the women constitute more than half of graduate students within a vast area of education while men are mostly present in the fields such as IT, engineering and construction sectors. Moreover, in 2016 there were more women with the Ph.D. (57%) than men (43%). On the other hand, there were more men in research sector as well as in SANU where 90% of the members are men.

Three-year high school education is finished three times more by male population while on the other side compared to women population that is more numerous at 4-year high school education. Accordingly, the data from 2016 indicates that the girl's share in grammar schools is 58%, comparing to the number of boys in 4 year high schools 53% (Women and men in Serbia, Statistical Office of Republic of Serbia, 2016).

When it comes to young people aged between 15-24, out of a total of 779,963 young people, more than half completed secondary education (431,032 young people with completed secondary school), while only 2,941 young people did not complete the primary education. Young women 15-24 are more interested in tertiary education than men. According to the data from 2015, there are 17,109 young highly educated women and 9,791 young highly educated men in Serbia (Statistical Office of Republic of Serbia, 2016).

5. CONCLUSION

According to the National Youth Strategy for the period from 2015 to 2025, using a large number of activities Republic of Serbia is trying to reduce the number of unemployed young people aged between 15 and 30. One of the aims is solving an issue about gender equalities. There are differences between the unemployment rate among men and women. Moreover, in some part of the country unemployment rate is much higher than for instance in Belgrade region. Regarding this, one of the reasons is a traditional overview

of the position of women is the fact that they are under the influence of their family patterns. The woman is more present in the household more than at the labour market. Additionally, male family members very often leave their families and go abroad searching for better job opportunities (Obradovic et al., 2017).

Dissatisfaction of young people, besides lack of job opportunities, is considered as an issue that additionally complicates the entrance to the labour market. It is important to say that the education presents for both sexes, an essential factor in their search for job opportunities. However, although women are very educated, they are still discriminated against in some ways and enter the labour market very hard.

Besides already mentioned Youth Strategy, Republic of Serbia implemented two laws with a tendency to regulate the problem of gender quality. According to this law, international standards within the area of equal men and women employment. To conclude with there is a massive tendency of protecting the position of women in the labour market and society as a whole.

In this paper, we have elaborately presented the differences at the labour market, including the particular focus on gender inequality. The review of the previous research, as well as the present situation, is made to help policymakers to find the most propriety solution in this area.

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VIRTUAL VERSUS TRADITIONAL TEAMS: TEAM DYNAMICS AND TEAM MEMBERS NEED SATISFACTION IN A LEARNING ENVIRONMENT

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Abstract: *A lot of researchers had discussed about team satisfaction and performance when team members working in virtual environment. In this study, our intention was to examine team satisfaction and performance in students' virtual teams, actually to compare students' group dynamic interaction, need satisfaction and academic performance when they are working in virtual and traditional teams. The research was conducted among students of the Faculty of Organizational Sciences, University of Belgrade, who attended the course Group Dynamics and Interpersonal Relations. The students were divided into four groups and all groups had the opportunity to follow both traditional and virtual practical classes, after which they were assigned a team task. Design of the study was quasi-experimental with repeated measures. Although we expected no difference between traditional and virtual student teams, since students replace many face-to-face activities with online activities and discussions, we found that working in traditional teams provide better understanding of the task, more quality communication and higher initial motivation. This research also indicate that there is a higher satisfaction of needs for autonomy and relatedness.*

Keywords: *virtual teams, traditional teams, e-learning, team dynamics, need satisfaction, academic performance*

1. INTRODUCTION

Nowadays, teams and teamwork are very popular topics, especially when it comes to teams in a business or learning environment. In many studies it is shown that teams in business can undertake more ambitious projects and their members can provide a greater variety of skills (Hansen, 2016). Teamwork, as every other field, has been influenced by the growth of information technology, as business people often require more flexible access to learning, their work and business communication (Berger 1999; Bull, Kimball, Stansberry 1998). In business environment virtual teams becomes increasingly common, not only because business people require it, they are also linked with significant savings, due to reductions in travel expenses, meeting times, duplication costs, and other expenditures (Robbins, Judge, 2007). Purvanova (2014) in her paper highlighted the researches which shows that virtual teams make companies and organizations more flexible, allowing them to handle the pressures created by the increasing business globalization and competition (Avolio, Kahai, Dodge, 2000; Bell, Kozlowski, 2002; Driskell, Radtke, Salas, 2003; Dundis, Benson, 2003).

There are also many researches which consider the importance of the teams in learning environment and virtual learning environment. With changing student lifestyles and fast-developing technology, universities are increasingly offering more "flexible" learning environments (Kemp, Grieve, 2014). Educational institutions recognize the need and obligation to prepare students for work and teamwork in virtual environment. Examples are e-learning and virtual project student teams, and both can have positive influence: e-learning and virtual team in education provide an opportunity for students to learn interpersonal skills that are useful in a virtual environment (Kozlowski, Ilgen, 2006). Virtual learning provides flexibility and it may be best for students who require alternatives to formal educational arrangements.

Since students manage study, work, and family life, they often replace many face-to-face activities with online activities and discussions, and it is expected that they might prefer at least some aspects of online learning to traditional classes. As everyday communication and activities students perform equally well in both online and offline environments, the assumption is that the success in the learning process and the performance of team tasks is not influenced by the environment in which students learn and accomplish their assignments. The aim of this study is to compare undergraduates' group dynamic interaction, need satisfaction and academic performance when they are working in virtual and traditional teams.

2. THEORETICAL CONSIDERATIONS

The worldwide trend toward e-learning and virtual teams result with a lot of debate about how they affect group dynamics, connection between team members, and do they affect positive or negative team performance. In the process of e-learning, teacher-centered model of teaching (the lecturer transmits

knowledge to students (Harden and Crosby, 2000; Prosser et al., 2005)) is replaced with less traditional classes with a greater focus on more student-centered learning (Balluerka et al., 2008), where students get work materials through some of the online education platforms, and then independently or in teams organize their learning process.

Previous researchers have suggested that this way of learning can produce more in-depth discussions and to improve the quality of learning (Smith, Hardaker, 2000), the extra time available for online activities might allow students to think about course material more critically and reflectively, leading to deeper understanding of the course content (Robinson, Hullinger, 2008). Hobbs in his research (2002) has suggested that the less confrontational or personal nature of e-learning might encourage shyer students to engage more, or to feel less pressure than in face-to-face interactions (Hobbs, 2002). Perceptions and experiences of the students are very important in the process of e-learning (Holley and Oliver, 2010; Ituma, 2011). Hensen (2016) has studied student experience and he has shown in his research that online student teams exhibit more positive communication, participate more in team activities and team members are more satisfied with their team than traditional teams.

Much of the initial experience of e-learning failed to live up to learners' expectations (Imel, 2002). There are studies that have shown negative sides and potential problems in the e-learning team, partly because of technological constraints, and partly because of the teaching staff approaches (Anderson, Dron, 2011). Efficiency, content and delivery method that are applied by teaching staff, influence the learning process (O'Neill et al., 2004). Some teaching staff seems to perceive web-based platforms simply as an alternative method for presenting the traditional content, whereas others might look for more innovative ways of using such platforms to improve students' engagement (Holley, Oliver, 2010; Ituma, 2011).

Further, perceptions and experiences of the students themselves have been largely neglected. Otter et al. (2013) found that students in online-only classes felt more disconnected from their peers and lecturers, more obliged to be self-directed in their studies. We can find a rational explanation for this in the theory of self-determination, where the basic psychological needs are the needs for autonomy, competence and relatedness (Deci, Ryan, 2000). New virtual space as a learning and working context might lack some of potentials to satisfy those needs. From one point of view, lack of face-to-face communication might diminish and restrain some aspects of interaction and relatedness with coworkers. The results of one study have exposed a tendency to greater satisfaction of needs for autonomy and relatedness when it comes to work in real team rather than when it comes to work in virtual team (Kovačević, Milinković, 2017). When observing the needs for autonomy and relatedness in real team, the need for relatedness is more satisfied than the need for autonomy, while in a virtual team there is the opposite tendency. On the other side, platforms for virtual learning and working provide possibility for constantly being in touch in real time.

It was noticed that there is a need for more research into what does and does not work in online learning, with a focus on the student experience.

2.1. Research problem

Many studies have so far highlighted the advantages of online teams in the learning process, as well as the positive dynamics that could be developed in online teams. Hensen (2016) has shown in his research that online student teams exhibit more positive communication, participate more in team activities and team members are more satisfied with their team than traditional teams.

Cristiana Cicei in her research (2012) discusses some negative aspects of e-learning and virtual student teams. She points out that learning and working in virtual settings being, from the students' perspective, less satisfying for team working than the traditional setting. She also claimed that team's problem solving process is considered to be less satisfying when learning and working online, than when interacting directly (Cicei, 2012).

Previous study mentioned above (Kovačević, Milinković, 2017), although provides interesting insight in the domain of need satisfaction, did not go beyond the subjective perception with the lack of the objective measure of task completion excellency. The current research was therefore designed to examine the satisfaction and performance while performing real task, in both traditional and virtual learning experiences, of students from the Faculty of organizational sciences, University of Belgrade, who were enrolled in the course Group dynamics and interpersonal relations.

On this course we had separated students in four teams with intention to compare undergraduates' group dynamic interaction, need satisfaction and academic performance when they are working in virtual and traditional teams.

2.2. Research goal and hypotheses

The main goal in current research is to compare students' communication, motivation and need satisfaction while working in traditional and virtual teams.

To accomplish this, through a qualitative analysis, we examined the student satisfaction with their work in traditional and virtual teams. Targets are related to the comprehensibility of materials and tasks when they are presented by the lecturer, face to face, and when they are placed on the platform through which team members communicate; to communication in the team, how much easier is for students to define and express their opinions when communicating face-to-face with colleagues, or communicating through the platform; and motivation for work, or do students take more initiative when working in the presence of other colleagues, and how willing are they to make an extra effort when sitting at home and working without time constraints and the presence of other people. Observing group dynamics through these three indicators, assuming there are no differences when students work in traditional teams and virtual teams, the following hypotheses have been defined:

Hypothesis 1: *There is no difference in the manner in performing task that includes understanding the task, quality of communication and motivation indicators:*

- a) *There are no difference in students 'understanding the task while working in virtual and in traditional teams.*
- b) *There are no difference in communicating actively while while working in virtual and in traditional teams.*
- c) *There are no difference in the level of effort and determination while execution of the task in virtual and in traditional teams.*

Often, researches indicates that the social interaction of face-to-face meetings allow people to interact socially, verbally, physically as well as work together psychologically. There are reasons for which students might prefer more traditional, in-class activities. Although social connectedness can be derived online (Grieve et al., 2013), most students feel that face-to-face contact is essential for building a sense of community (Conole et al., 2008). We can find a rationale for this in the theory of self-determination, where the basic psychological needs are the needs for autonomy, competence and relatedness.

Assuming that in the student teams, both traditional and virtual, the need for competence is met, the target of this paper is also to check if there is a difference in meeting the needs for autonomy and relatedness in the context of work and learning in traditional and virtual student teams. We have come to the assumption that both contexts can have advantages and disadvantages in meeting needs. On the one hand, the absence of direct contact can limit some aspects of closeness among students, but it can enable constant communication in real time and possibly greater autonomy in work. If we provide the teams with the opportunity to get to know each other and do something together, before they start working in a virtual environment (as is most often case with student teams), all needs will be equally satisfied both in traditional and virtual teams.

Hypothesis 2: *There are no significant differences in need satisfaction while working in traditional compared with virtual teams:*

- a) *There are no significant difference in meeting the need for relatedness while working in traditional compared with virtual teams.*
- b) *There is no significant difference in meeting the need for autonomy while working in traditional compared with virtual teams.*

As the most important output from the learning process (in both modalities of learning) are the individual and group results that a student achieves, the aim of the paper is to prove that students' success does not depend on the way they are preparing for testing and passing the exam (either traditionally or virtually), so the last hypothesis relates to:

Hypothesis 3: *There is no significant difference in the results achieved by the students on the test and the group tasks, while working in traditional compared with virtual teams.*

2.3. Variables

Independent variable in this research is the environment of performing task: virtual/traditional

Dependent variables are:

1. Manner of performing, including understanding of task, quality of communication and effort and determination (level of motivation)
2. Need satisfaction (relatedness, autonomy)
3. Test results (group and individual)

Control variable: order of experience (two different orders)

Stimulus: concrete tasks to perform considering the cases in the domain of conflict and communication topics.

3. METHODS

As the main assumption in current research is that there is no difference between traditional and virtual student teams, both quantitative and qualitative methods of inquiry were used to capture the dynamic interaction in groups and satisfaction of basic psychological needs. Individual tests were used to show that academic performance does not depend on the environment in which students work. Design of the study is quasi-experimental with repeated measures.

3.1. Sample

The sample consisted of 20 students, from 22 to 23 years. All of them are students of Faculty of organizational sciences, University of Belgrade, fourth year at the department Quality management and standardization. All of them had experience of learning and working in the virtual and the traditional student teams.

3.2. Instruments

Since our intention was to investigate student satisfaction, using qualitative method, we create a questionnaire that had 15 questions, in two parallel versions, to examine whether there is a difference in:

1. Understanding the tasks, (a) when the teacher explains the task to the students, (b) when it is just placed on the online platform without any additional explanation;
2. The communication process, is it easier for students to express their thoughts and feelings (a) when communicating face-to-face with other colleagues, (b) when communicating electronically.
3. Motivation, or which environment influences more on students to make additional effort to accomplish the task.

Table 1: Example of items in Satisfaction questionnaire

Variables:	Example of items:
Understanding of task	1.a. When I work in a traditional team, I understand the task without any problems and what is expected of me. 1.b. When I work in a virtual team, I understand the task without any problems and what is expected of me.
Quality of communication	2.a. When I work in a traditional team, I can more easily express my opinion. 2.b. When I work in a virtual team, I can more easily express my opinion.
Effort and determination	3.a. When I am working in a traditional team, I can notice when other members making an extra effort, so I have the desire to do my best. 3.b. When I am working in a virtual team, I can notice when other members making an extra effort, so I have the desire to do my best.

Students were asked to rate, on a scale of 1 ("completely disagree") to 5 ("completely agree"), how they experienced work in a traditional and virtual environment.

Further, during the research, we used a modified questionnaire of basic psychological needs (Deci, Ryan, 2000), which was reduced to 15 questions of autonomy and relatedness in two parallel versions (for the traditional and virtual team).

Also, students were asked to rate, on a scale of 1 ("completely disagree") to 5 ("completely agree"), how they felt when it comes to meeting their needs for autonomy and relatedness in a traditional student teams and virtual student teams.

Table 2: Example of items in questionnaire of basic psychological needs (Deci, Ryan, 2000)

Variables:	Example of items:
Autonomy	1.a. When I work in a traditional team, I usually feel that I can decide on how I will do my part of the job. 1.b. When I work in a virtual team, I usually feel that I can decide on how I will do my part of the job.
Relatedness	2.a. Members of the traditional team I work with, I consider as my friends. 2.b. Members of the virtual team I work with, I consider as my friends.

As we want to measure their academic performance too, we used knowledge test, where they had questions from parts that were learned either traditionally or virtually.

3.3. Procedure and data analysis plan

The research was conducted among students of the Faculty of Organizational Sciences, who attended the course Group Dynamics and Interpersonal Relations. The students were divided into four groups, each group had five students. All groups had the opportunity to follow both traditional and virtual practical classes, after which they were assigned a team task.

Team 1 and Team 2 the first part of the course (Topic: Team Dynamics and Conflict Resolution) were attending in traditional teams. After the lectures were completed, the teams got explanation what their task was. The first part of the task was to complete the part related to the simulation of the conflict situation, where through the discussion they should solve the problem. The second part of the task was related to the written part, where they got a case study, with the task to write as many conflict resolution strategies as possible. The same lecture and the same tasks were set up to Teams 3 and 4, for which we created the online environment for learning and team working (Microsoft Office 365 Education Platform - Teams).

The second part of the lesson (Topic: Interpersonal communication), Team 3 and Team 4, was followed in a traditional way, while Teams 1 and 2 were online. Classes were held by teacher who explained the material and the requirements that should be done through the tasks to teams 3 and 4. Teams again had a couple of exercises that required a discussion and after that a team task that was done in written form. For teams 1 and 2 the same lecture and the same tasks were set up on online platform.

After two weeks, students who now had experience both in traditional and online teams were given to fill in two questionnaires. The first one concerned to the satisfaction of team work in traditional and the virtual environment, and the questions were related to the comprehensibility of materials and tasks, communication with team members and motivation, actually their engagement in both the traditional and the virtual team. The second questionnaire referred to meeting the needs for autonomy and relatedness. Additionally, students were given the test knowledge to check if the change in the environment had an impact on their academic performance.

In the data analyses we used descriptive statistics and t test for significance difference (with repeat groups).

4. RESULTS

The results which are related to Hypothesis 1, that there is no difference in the manner in performing task that includes understanding the task, quality of communication and motivation, are summarized in Table 3. Results show that there is the difference, in process of understanding of task, communication and effort and determination, and all goes in favor of traditional team work.

Table 3: Results of students' satisfaction with process (virtual versus traditional teams)

Satisfaction with process	Environment	Mean			Significance of differences		
		AS	SD	N	t	df	Sig.(2-tailed)
Understanding of task	Traditional	4.7400	.05822	20	6.666	19	.000
	Virtual	3.6800	.16821	20			
Quality of communication	Traditional	4.3700	.09655	20	4.160	19	.001
	Virtual	3.6700	.15846	20			
Effort and determination	Traditional	3.3800	.24188	20	4.186	19	.001
	Virtual	2.7200	.21541	20			

When it comes to the results of need satisfaction, there is also a higher satisfaction for autonomy and relatedness in traditional than in virtual teams (on lower level of significance) (Table 4). T test for significance

difference (with repeat groups) for the autonomy is $t(20)=2.607$, $p<.05$, while satisfying experience for relatedness show indicator $t(20)=2.54$, $p<.05$.

Table 4: Results of students' need satisfaction (virtual versus traditional teams)

Need satisfaction	Environment	Mean			Significance of differences		
		AS	SD	N	t	df	Sig.(2-tailed)
Autonomy	Traditional	4.036	.088	20	2.607	19	.017
	Virtual	3.728	.125	20			
Relatedness	Traditional	4.256	.100	20	2.540	19	.020
	Virtual	4.150	.121	20			

If we look at the results in Table 5, we can conclude that the results of student work depend on the environment in which students follow the lessons and do their tasks. Success on team assignments is better when students work in a traditional environment than when they work in virtual environment.

We did not take individual test results on knowledge test into consideration, as they depend on many other factors.

Table 5: Results of students' academic performance (virtual versus traditional teams)

Academic performance	Environment	Mean			Significance of differences		
		AS	SD	N	t	df	Sig.(2-tailed)
Group results	Traditional	29.50	.199	20	4.745	19	.000
	Virtual	25.50	.835	20			

5. DISCUSSION AND CONCLUSION

Although we expected no difference between groups, results goes in favor of traditional team work. We found that working in traditional teams provide better understanding of the task, more quality communication and higher initial motivation. There is also a higher satisfaction of needs for autonomy and relatedness (on lower level of significance), which is in the concordance with previous researches (Imel, 2002; Anderson, Dron, 2011; Kovačević, Milinković, 2017) indicating higher intrinsic motivation of team members. The most important founding is the significant difference in team performance clearly pointing toward the traditional team as the superior mean of finishing learning tasks.

These results are not in concordance with some other studies which that emphasized the positive effects of e-learning (Smith, Hardaker, 2000; Robinson, Hullinger, 2008), with numerous personal and performance related advantages of it, with some of them could be relevant for learning via teamwork platforms. It particularly referred to the domain of communication, participation and satisfaction, as some researches point out as the benefit of virtual teams (Hensen, 2016).

Our sample is limited, as well as the research design itself; nevertheless there is relatively strong evidence that in the specific context traditional teams might be superior over virtual providing more guidelines for students in face to face communication evoking higher motivational potential visible also in concrete results. It might not be the case in some other situations with different tasks and demands from team members, and one of the important factors might be the effect of randomly assigned order of experience for different teams. Also, we did not take into consideration individual differences of our participants, as some studies found benefits of virtual teams for more introverted students (Hobbs, 2002). For example, for some students environmental factors as well as the order of the experience might make a difference, and for some others it might be irrelevant while performing task.

Finally, the experimental design might be "responsible" for the resulting trend. The nature of the task and the way that learning demands are set could be more adjusted toward traditional team work, which goes in favor to several scholar's conclusions that teaching approach and platform itself have influence on learning process (O'Neill et al., 2004; Anderson, Dron, 2011). Due to the fact that all team of students are working traditionally as well as virtually (only in different time), it is possible that they perceive these virtual experiences only as an additional learning tool, not the complete no way of performing activities. This problem was recognized in some researches (Holley, Oliver, 2010; Ituma, 2011) only considering the teacher's side but it also could be the students point of view.

Even though this research show that students and teachers are not yet ready to accept the process of digitization and go into the virtual environment, it's unavoidable that this will step by step have to happen.

Future researches should aim at the process of adapting students to e-learning, and the professors to look for more innovative ways of using online platforms to improve student engagement.

Activities that should be improved in the process of online working with students, as Kemp and Grieve (2014) emphasize in their research, are: to enforce more engagement (students feel more engaged when the activities are complete in the social environment, rather than online); to give and to ask for immediate feedback (students appreciate the fact that each comment they made in class directly provoke a comment from a peer, or a teaching staff. In online environment they have to wait hours for a response); to induce students to read comments (students have no wish to read the comments and to engage in an online discussion).

In this study, even though we started from the idea that students appreciate the flexibility of online studying, it is shown that they more appreciate explanation from the lecturer, they value face-to-face rather than face-to-screen communication, and they are more engaged in traditional class environment. Still, there is a great opportunity for academic institutions to use the potential of online technology, not only as alternative modality for delivering academic content, but to inspire students' engagement and success at university and beyond.

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RELATIONSHIP BETWEEN WORK-LIFE BALANCE AND WORK ENGAGEMENT AMONG HIGHER EDUCATION LECTURERS

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Abstract: Key research objectives of the study were to empirically test the relations between the construct of work-life balance and the three dimensions representing work engagement – vigor, dedication and absorption - by empirically testing a structural model linking these constructs and determining the relations. A six-country survey was conducted on a sample of higher education lecturers from Austria, Croatia, Czech Republic, Germany, Serbia and Slovenia with a sample size of 305. Findings showed that work-life balance is positively related vigor, whereas the relation to dedication can due to the lack of statistical significance be neither confirmed nor refuted and as a surprise came the relation between work-life balance and the third dimension of work engagement – absorption, which was negative. Results of this study can be used both for further research and in practice.

Keywords: work-life balance, work engagement, higher education lecturers, SEM

1. INTRODUCTION

The two key spheres in the life of an adult are work and family, and both are important for the individual. We could say that they are the "two sides of the same coin". The conflict between work and life can lead to stress and other health problems, and on the other hand, a work-life balance affects quality and satisfaction in both private and working life.

The roles of an individual are often excluded. Greater involvement in one area or role can reduce attention in other areas, or with the other words, if an individual devotes more time to one area, it left less time for another (Adkins and Premeaux, 2012). Successful work-life balance also has an impact on the individual's work engagement (Bedarkar and Pandita, 2014). The perception of work-family balance is linked to the individual's sense of being supported by the organization and that he or she is meaningful value for an organization (Timms, Brough and Bauld, 2009). Another reason is that those employees who, in addition to their work, are also responsible for caring for their families, are limited in their availability to work, and if they fail to balance work and family, engagement in work can turn into burnout (Banihani, Lewis and Syed, 2013).

Various researches confirmed the connection between work-life balance and work engagement. Some studies (e.g. Caesens and Stinglhamber, 2014; Mache, Vitzthum, Klapp and Danzer, 2014; Taghipour and Dezfuli, 2013) have thus shown that family-friendly policies and practices of the organization has an impact on the individual's increased commitment to work. The Swanberg, McKechnie, Ojha and James (2011) survey showed that some family-friendly measures, such as leadership support and employee control over timetables, not only help to balance work and family, but also have a significant impact on the increased work engagement of employees. Similarly, the results of Kar and Misra (2013) research confirmed that employees who get the organization's support in work-family balance are more satisfied at the workplace and more closely related to organization. The research (Rothbard, 2001) also showed that the family does not negatively affect the individual's engagement at work, but in particular women are even more engaged at their work if they have family. These findings show that organizations should instead of restricting family responsibilities and participation in other roles, continue to promote these activities as they have a positive impact on the employees' behaviour at work.

The relationship sometimes also exists in the opposite direction, since not only the work-life balance influences the work engagement, also the work engagement can influence a work-life balance. The research (Siu et al., 2010) showed that the work engagement of an individual significantly contributed to perception of the work-life enrichment.

We therefore hypothesize, that work-life balance positively relates to work engagement on the dimensional level, where the three dimensions of work engagement are: vigor, dedication and absorption (as presented in Figure 1). First we begin with a theoretical review of work-life balance and work engagement, and continue with an empirical analysis using SEM to test the relations and discuss our findings.

2. THEORETICAL REVIEW

2.1. Work-life balance

The problem of the work-life balance is a broad concept and it can be analysed from several aspects: psychological, sociological, gender or aspect of the working environment culture (Sukalova, Ceniga and Janotova, 2015). The psychological aspect focuses on how problems with the work-life balance are connected with stress and work dissatisfaction as well as the psychological health of an individual. The sociological aspect focuses on work-life balance from the social state policy point of view, while the gender perspective focuses on the gender differences in the frame of the work-life balance.

The term work-life balance has three components - "work", "life" and "balance" (Suresh and Kodikal, 2017). "Work" is a paid work, or the employment (Guest, 2002), and "life" is all activities outside of work (Suresh and Kodikal, 2017), such as, household activities, friends, family and community (Skinner and Pocock, 2008). Thus, the work-life balance is in a broader sense, the work-life balance could be described as the satisfactory involvement or adaptation between several roles in an individual's life (Bedarkar and Pandita, 2014). Different people will value the work-life balance differently, according to their values and circumstances (Othman, Yusof and Osman, 2009).

There are several factors that influence the individual's work-life balance. They are roughly divided into individual-level factors, organizational-level factors, and country-level factors. Factors at the individual level include the influence of personality traits on the work-life balance (Turluc and Buliga, 2014), the impact of gender on the work-life balance (e.g. Southworth, 2014) as well as parenting and the partner's support in balancing work and personal life (e.g. Ferguson, Carlson, Zivnuska and Whitten, 2012).

Another set of factors are the organizational-level factors. For an individual, it is important to perceive the organization as family-friendly, since this significantly influences the reduction of work-family conflict (Lapierre et al., 2008). Organizations can help to reduce work-family conflicts with family-friendly programs that can help an employee to balance work and family or the obligations of working and family life (Boyar et al., 2008). In practice there are several work-life balance policies and practices. The most common are the flexible schedule, the use of overtime, part-time work, "pressed" working week, flexible working hours, work from home, holidays, etc. (Parakandi and Behery, 2016). Employees with access to work-life balance policies and practices often reported better psychological well-being, because the ability to use work-life balance practices enable them sufficient time also for a family and therefore they feel less stress with balancing work and family (Kashyap, Joseph and Deshmukh, 2016). But not only a work-life balance policies and practices are important for employees' work-life balance, numerous studies evidence also an important role of the leader (e.g. Greenhaus, Ziegert and Allen, 2012; Maxwell, 2005). On the one hand, the leader contributes to the development of work-life balance policies and practices, and on the other hand plays a key role in the implementation and monitoring of the results of these policies (Maxwell, 2005).

In addition to the role of the individual and the work organization, researches (Stier et al., 2012, Roeters, 2011, Trefalt et al., 2013) show that the state also significantly influences on work-life balance. With its policies and measures, the state creates more or less favourable conditions for the work-life balance. The main initiatives of the state focus primarily on the field of child care, leave, which provides care for dependent family members, flexible forms of work and equal opportunities for women and men.

2.2. Work engagement

Employees' engagement is one of the important topics in human resource management, among other things, because it is strongly associated with organizational productivity (Gujral and Jain, 2013). Organizations need employees who devote themselves energetically and committedly to their work, or in other words, organizations need engaged employees (Bakker and Schaufeli, 2008).

Gallup (2006) divides employees into three types: engaged, unengaged and actively unengaged. Engaged employees work with passion and feel deeply linked to their organization. They promote innovation and move the organization forward. Unengaged employees are essentially "disconnected". Time at work pass passively, they devote their time to work, but not energy or passion. The third, actively unengaged employees, are not only dissatisfied at the workplace, but they even create this dissatisfaction. These workers undermine what their co-workers make (Robertson-Smith and Markwick, 2009).

The two main concepts of work engagement definition exist. The first concept defines work engagement as the opposite of burnout, namely, work engagement is characterized by energy, co-operation and efficiency, which is contrary to exhaustion, cynicism and lack of efficiency, the three main components of burnout

(Maslach, Schaufeli and Leiter, 2001). The other concept defines work engagement as an independent concept, namely, as a positive, fulfilled, work-related state characterized by vigor, dedication and absorption (Schaufeli and Bakker, 2004, Schaufeli et al., 2002). Vigor means that an individual has a high level of energy during work and is mentally resistant. Dedication refers to the fact that the employee is strongly involved in his work and at the same time he experiences a sense of relevance, enthusiasm and challenge. Absorption means that the individual is fully concentrated and immersed in his work, his time at work runs fast and he is hardly misconduct (Schaufeli and Bakker, 2004, Schaufeli and Bakker, 2003). For the purposes of our research, we will use the latter definition, i.e. engagement as an independent concept.

The work engagement of employees is influenced by number of factors, roughly divided into institutional and personal factors (Mache et al., 2014). The institutional factors are working resources, and the individual factor is personality. The research (Chen, 2017) carried out among teachers has shown that working demands negative affect work engagement and on the other side working resources positive affect work engagement. Work engagement is therefore high when employees have good social and non-social resources at the employment level (Christian et al., 2011). On the other hand, the work requirements, such as overloading work, emotional demands or the work-home interference negative impact the work engagement (Schaufeli, Bakker and Van Rhenen, 2009; Chen, 2017).

The employee's work engagement has many positive outcomes. For example, work engagement plays an important role in promoting work ability (Airila et al., 2012) and greater work performance (Bakker, 2011; Christian et al., 2011); work engagement has also positive effects on an individual's work and life satisfaction (Mache et al., 2014). Work engagement also serves as a mediator between the effects of high work demands and organizational commitment (Hakanen, Bekker and Schaufeli, 2006) and plays an important role as a mediator between family-friendly organization policies and the work-family enrichment (Siu et al., 2010).

3. RESULTS

The full set of questionnaires was completed by a total of 305 online participants, all of which were higher education lecturers, which represent our sample, of whom 69 (22.6%) were men and 108 (35.4%) were women – 128 (42.0%) did not respond to this question. The average age of respondents was 45.26 years. On the average they had 18.91 years of work experience overall, of which 15.13 were in higher education. According to the marital status of respondents: 106 (34.8%) were married, 11 (3.6%) were divorced, 40 (13.1%) were in a committed relationship, 4 (1.3%) were engaged and 16 (5.2%) were single - 128 (42.0%) did not respond.

According to the educational level of respondents: 5 (1.6%) were with B.Sc. or B.A., 36 (11.8%) were with M.Sc. or MBA and 135 (44.3) had a Ph.D. - 129 (42.3%) did not respond to this question. According to their academic rank: 29 (9.5%) were teaching assistants, 16 (5.2%) were research assistants, 62 (20.3%) were assistant professors, 36 (11.8) were associate professors and 32 (10.5%) were full professors – others did not respond to this question. According to their work status: 150 (49.2%) had full time employment, 17 (5.6%) had part time employment, 8 (2.6%) worked per contract and 1 (0.3%) was self-employed – 129 did not respond.

Table 1: Means and standard deviations for the items of work-life balance

Item	<i>n</i>	M	SD
I currently have a good balance between the time I spend at work and the time I have available for non-work activities.	305	3,01	1,310
I have difficulty balancing my work and non-work activities.	305	3,19	1,307
I feel that the balance between my work demands and non-work activities is currently about right.	305	2,96	1,272
Overall, I believe that my work and non-work life are balanced.	305	3,11	1,306

Descriptive statistics for the variables constructing work-life balance (Brough et al., 2014) are presented in Table 1 and those constructing work engagement (Schaufeli and Bakker, 2004) by dimensions are presented in Table 2.

Table 2: Means and standard deviations for the items of work engagement by dimensions

Item	n	M	SD
<i>Vigor</i>			
At my work, I feel bursting with energy.	305	3,33	1,069
At my job, I feel strong and vigorous.	305	3,48	1,070
When I get up in the morning, I feel like going to work.	305	3,40	1,090
<i>Dedication</i>			
I am enthusiastic about my job.	305	4,04	0,981
I am proud on the work that I do.	305	4,25	0,863
My job inspires me.	305	4,15	0,962
<i>Absorption</i>			
I am immersed in my work.	305	3,85	0,973
I get carried away when I'm working.	305	3,82	0,960
I feel happy when I am working intensely.	305	4,02	0,923

Empirical research was performed by survey method. To obtain data, we designed an online questionnaire, which was sent via e-mail in winter 2018. We have used convenience sampling, which is the most common (Etikan, Abubakar Musa, and Sunusi Alkassim, 2016), where people from six countries were invited via e-mail to participate in our survey. After conducting online research, primary data was controlled and edited. For processing and analysing data, we have used IBM SPSS Statistics 24 and Lisrel Student Edition 9.30 software package.

In continuation, we present a method to test the model by applying structural equation modelling (SEM), which is used for testing structural relations between constructs. That operation was made by building a model in Lisrel Student Edition 9.30 software package, which is an analytical statistics program, which allows the testing of multiple structural relations at once (Prajogo & McDermott, 2005). It combines factor and regression analysis by which it tests the proposed model by which we can assess the significance of hypothesised cause-and-effect relations among the variables (Diamantopoulos & Siguaw, 2000). The standardized solutions and t-values for the hypotheses tested in the model are presented in Figure 1 and Figure 2.

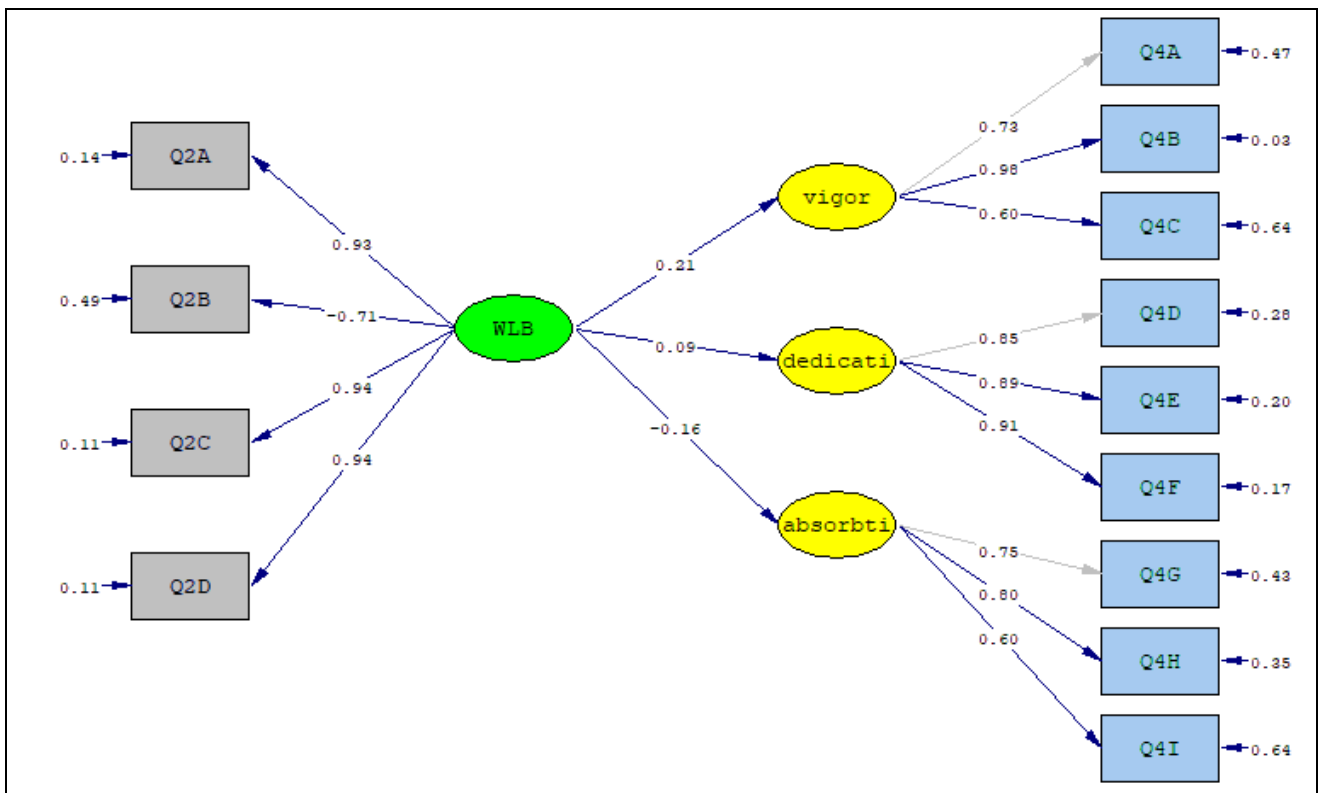


Figure 1: Standardized solution of the tested model

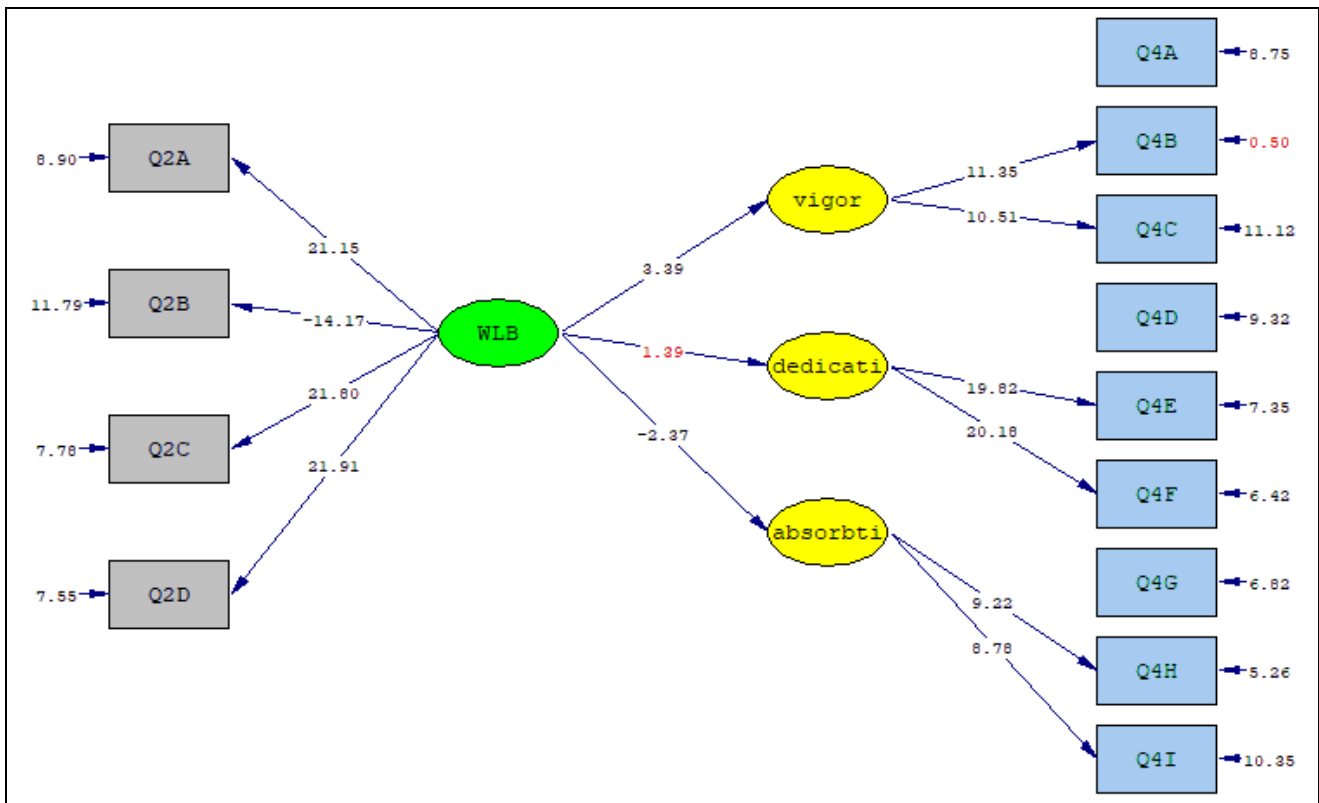


Figure 2: T-values for the tested model

4. DISCUSSION

Our research intended to test the structural relations between work-life balance and the three dimensions of work engagement among higher education lecturers. Our main aim was our hypothesized model in which *work-life balance positively relates to work engagement on the dimensional level, where the three dimensions of work engagement are: vigor, dedication and absorption* to test three hypotheses. Therefore, we launched the diagrams and presented the course of the research model, which tested these relations (Figure 1). The standardized coefficient values are presented in Figure 1, and the t-test values in Figure 2. We used a combination of exploratory and confirmatory methods with the goal to develop a model, which complemented theoretical predisposition and fit the data.

The fit indices of the structural model (Figure 1) are as follows: $\chi^2/df = 9.86$ and $RMSEA=0.17$, $NFI = 0.799$, $CFI = 0.814$, $SRMR = 0.258$, $GFI = 0.775$. We wanted to test the relations between the constructs in this model; two of which are statistically significant and one is not according to the t-test values. The whole model shows statistical significance of $P\text{-value}=0.00000$.

As seen from Figure 1 and Figure 2, work-life balance is positively and statistically significantly related to the first dimension of work engagement - vigor (Standardized solution = 0.21, t-test = 3.39), whereas we cannot confirm that with statistical significance regarding the relations between work-life balance and the second dimension of work engagement - dedication (Standardized solution = 0.09, t-test = 1.39), and we also add that the relation between work-life balance is negatively and statistically significantly related to the third dimension of work engagement - absorption (Standardized solution = -0.16, t-test = -2.37).

5. CONCLUSION

Due to research results we cannot confirm, that the relations between work-life balance and the three dimensions of work engagement among higher education lecturers are positive even if we hypothesised so based on the literature review. In fact, we have found only one positive relation, which is between work-life balance and the first dimension of work engagement – vigor, whereas the second was not statistically significant and we can therefore neither confirm nor refute it and the third relation between work-life balance and the third dimension of work engagement - absorption was negative.

For further research, we suggest investigating the effects of the determinants omitted or to put in other words not included in our study. In order to advance to the results interpretations, we should first analyze the limitations of this research. The study was focused mostly on how higher education lecturers' work-life balance relates to their work engagement, whereas other determinants were not considered, and there are also other factors involved in achieving work engagement.

The theoretical contribution of this study is to the existing research of work-life balance and work engagement in the aspect of advancing previous research by empirically examining the relations between both of them. The practical contribution is in the presented results that the relations are also present in the case of higher education lecturers.

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FACING INDUSTRY 4.0 COMPETENCES DEMAND: THE IMPORTANCE OF TRAINING OF TRAINERS

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Abstract: *In the era of digital transformation the theme of competences plays a crucial role. In the manufacturing sector, the diverse national initiatives that have been launched following the German Industrie 4.0 Plan try to identify, inter alia, the set of skills that are necessary to cope with the new requirements of the labour market. In this framework, significant researches are being carried out to build appropriate competency models whereas a minor attention seems to be paid to the aspect concerning the training of trainers. This paper intends to address this specific issue through a quick analysis of the existing competency models and the presentation of a project implemented by Università degli Studi Guglielmo Marconi (USGM) that aspires to become a good practice in the Italian context.*

Keywords: *Digital Transformation, Industry 4.0, Training of Trainers, Competences, Academia - Industry Cooperation*

1. INTRODUCTION

Digital Transformation is one of the most abused buzzword in the latest years. Behind those two words, a universe of potential definitions and interpretations open up and if on the one hand this feeds the general interest, on the other it increases the confusion that is often related to disruptive changes.

Technology is undoubtedly the main factor of change in the modern world. A change which happens with a rapidity never seen before, where nothing is evolutionary or linear but rather exponential. Thanks to the acceleration imposed by digital, business has to prepare to sustain diverse speeds balancing the requirements for stability of the most classical and governable processes with those of rapidity of innovative and not predictable processes. Those two speeds impose new organizational models but, above all, the re-discussion of the constituting values of the organizations themselves which have to rethink their own fundamental principles.

At a first sight, digitization is characterized by a series of disruptive changes which are very diverse from each other:

- Communication and replication free of charge, at a global scale and in real time of information expressed in bit (0,1)
- Collection, storage and analysis of data, related to all is moving on the web, with the possibility of profiling situations and people, making it statistically predictable their behavior
- Development of learning algorithms enabling to learn from experience, automatically facing problems of a certain degree of complexity
- Use of intelligent machines, which makes flexible works and are able to interact with other machines and people through sensors and data
- Distance interaction among people (and also machines) which can this way exchange ideas, projects and decisions, developing forms of shared intelligence and creativity

At the centre of those changes is the *economy of data* – which are different from products and services – and the *centrality of the individual*. On the basis of the changes enabled by digital transformation, organizations have to modify their business model and their approach to the market, not only by developing new products and/or services but also thinking and acting in a digital way. This is the concept of “Digital at the core”, which the new generation of leaders have to cope with. The rapidity of innovation grows exponentially but, above all, what grows is the need to rapidly build up new capacities enabling new Business Models and innovative work organization and processes.

The most important investment for the present and the future of organizations, and of economic systems to a broader extent, is the development of human capital that have to be endowed with new and transversal skills and competences.

Hence, the world is changing rapidly and the search for acquiring the required abilities has to come with that digital transformation which affects all economic domains but that has found in the manufacturing sector its first and most important stimulus to communication and development.

2. THE FOURTH INDUSTRIAL REVOLUTION: A MATTER OF COMPETENCES

Industry 4.0 is an expression which has become very popular in the political, social and economic debate in Europe (and beyond) which originated from the German manufacturing sector where the term was coined in 2011 within the HighTech-Strategy 2020 action plan launched by the Federal Government.

The term describes the organisation of production processes based on technology and devices autonomously communicating with each other along the value chain: a model of the 'smart' factory of the future where computer-driven systems monitor physical processes, create a virtual copy of the physical world and make decentralised decisions based on self-organisation mechanisms. As a result, "manufacturing systems are vertically networked with business processes within factories and enterprises and horizontally connected to spatially dispersed value networks that can be managed in real time – from the moment an order is placed right through to outbound logistics" (DG for Internal Policies, Policy Department A: Economic and Scientific Policy, 2016).

Generally speaking, Industry 4.0 identifies what is defined as the Fourth Industrial Revolution where the real innovation is characterized by the capacity of technologies of providing products and services through the interaction, in form of network, among machines, physical goods, virtual objects, systems of calculation and memorization, communication devices, energy containers.

Actually, the scope of the digital transformation justifies such a definition but it is important to underline that this Revolution presents specific features which, compared to similar situations in the past, delineate a diverse scenario since:

- a. it is not characterized by new technologies but rather by existing technologies combining and operating in a joint way
- b. the rapidity affecting the way in which technologies evolve and produce innovations has increased
- c. it has a pervasive dimension involving the whole supply chain and the relationship among the different actors, including consumers
- d. it is a transformation that does not affect manufacturing only but also other sectors of economy such as agriculture, services and tourism as well as public administration and education (Cervelli G., Pira S., Trivelli L., 2017).

In this framework, the theme of competencies is crucial and assumes a particular importance even in the light of the consequences of digitalization on employability which are still uncertain. Most occupations are indeed undergoing a fundamental transformation. While some jobs are threatened by redundancy and others grow rapidly, existing jobs are also going through a change in the skill sets required to perform them. The debate on these transformations is often polarized between those who foresee limitless new opportunities and those envisaging massive dislocation of jobs.

In many industries and countries, the most in-demand occupations or specialties did not exist 10 or even five years ago, and the pace of change is set to accelerate. By one popular estimation which is frequently cited, 65% of children entering primary school today will ultimately end up working in completely new job types that do not exist yet. In such a rapidly evolving employment landscape, the ability to anticipate and prepare for future skills requirements, job content and the aggregate effect on employment is increasingly critical for businesses, governments and individuals in order to fully seize the opportunities presented by these trends and mitigate undesirable outcomes (World Economic Forum, The Future of Jobs, 2016).

A study conducted in Italy in 2016 by a interuniversity consortium named CRISP together with TABulaex, a spin-off created by Bicocca University of Milan, has analyzed 121000 job advertisements in the manufacturing sector over the last five years concerning the region of Milan identifying 65 new professional profiles that can be ascribed to the 4.0 technological revolution (Il Sole 24Ore, Nuove professioni da Industria 4.0, 2016). Moreover, even the existing jobs are going through a change in the set of competences needed. Tomorrow workers and employees will be requested to do more in terms of managing complexity, problem solving, acting autonomously, possessing communication skills and being able to organize work activities with their colleagues. Shortly, they will be asked to put in place more and more their own potentialities and abilities which appear necessary for improving the quality of their work, ensure a more interesting environment and facilitate their professional experience (Magone, Mazali 2016).

So, the implications of the technological innovation on the work in the factory are complex and significant. On the one hand we are witnessing to the birth of new very specialized profiles with high technical skills whilst on the other we notice that some professions are disappearing or getting impoverished. Surely, decision-making and digital skills will become essential.

Within an enterprise willing to adopt the Industry 4.0 model, the role of competences is therefore decisive. The use of enabling technologies requires specific technical skills whilst the new business models and the penetration of highly competitive markets need advanced managerial skills and the complexity of production processes and organizational models necessitate new transversal competences. All those needs require a proper management able to adopt a specific competency model contributing to define and classifying the professional profiles and their functions.

According to Prifti et al., Competency Model is a valid, observable, and measurable list of the knowledge, skills, and attributes demonstrated through behavior that results in outstanding performance in a particular work context (Prifti et al., 2017). The construction of a competency model requires techniques and tools which can vary depending on the company. For the purpose of this paper it is useful to report an example of model for industry 4.0 which does not refer to a specific company but that can be applied to whatever business intends to implement the principles of the new paradigm and adopt the main enabling technologies. The model suggests a scheme identifying eight big categories of skills referring to the main aspects of the work activity. Those big eights are in turn divided in twelve dimensions of competency which originate a bigger number (112) of specific competences, both transversal and technical divided into three standard training paths (information systems, computer sciences, engineering). On the base of those skills, it will be possible to detect the behaviors corresponding to a correct and performing execution of the competences, in line with the objectives and strategies of the company.

The model above, based on the SHL Universal Competency Framework developed by CEB Inc.¹, is based on different competency approaches from research and practice. Other models are present in literature or are about to be published identifying the different competences and organizing them into diverse categories such as soft skills, hard skills, interdisciplinary skills and so on.

Of course, those models are quite exhaustive and this kind of research is extremely valuable but do not help replying (of course it is not its purpose) a crucial question: *who is going to teach those competencies? How and by whom trainers will be trained to convey those skills?*

Today the institutions which are responsible for the creation of new skills and knowledge like schools and universities are in a difficult position due the rapidity of transformation. Firstly what it is needed is "learning to learn", i.e. to be open towards innovation and accept that the new knowledge may not have the time to be included and codified in a classic textbook but has to be considered like a liquid knowledge from which all concerned people can draw and to which all concerned people have to contribute for further development.

Schools, universities, public and private institutions have to combine the traditional capability to provide a basic cultural education with the ability to offer new contents with a rapidity of change which is unknown at the moment.

At present, apart from big companies, SMEs come into direct contact with the new technologies in a not structured way. Even universities, apart some excellences, do not have a systemic and unique approach. The public debate about a potential *training 4.0* has started but it has not been realized yet that the production of knowledge has a rapidity which is not consistent with the usual times of traditional training and with the generational replacement of teachers.

For this reason it is necessary that the development of competences becomes a central pillar of the government policies.

Big Eight	Competency Dimensions	Competencies		
		Information Systems (IS)	Computer Science	Engineering
Leading & Deciding	Deciding and Initiating Action		<ul style="list-style-type: none"> Decision Making Taking Responsibility 	
	Leading and Supervising		<ul style="list-style-type: none"> Leadership Skills 	
Supporting and Cooperating	Working with People		<ul style="list-style-type: none"> Teamwork Collaborating with Others Communicating with People 	
	Adhering to Principles and Values		<ul style="list-style-type: none"> Respecting Ethics Environmental Awareness Awareness for Ergonomics 	
Interacting and Presenting	Relating and Networking		<ul style="list-style-type: none"> Compromising Creating Business Networks Maintaining Customer Relationships 	
	Persuading and Influencing		<ul style="list-style-type: none"> Negotiating Emotional Intelligence 	
	Presenting and Communicating Information		<ul style="list-style-type: none"> Presentation and Communication Ability 	
Analyzing and Interpreting	Writing and Reporting		<ul style="list-style-type: none"> Targeted/Technical Communication Literacy 	
	Applying Expertise and Technology		<ul style="list-style-type: none"> IT and Technology Affinity Economics Extract Business Value from Social Media 	
			<ul style="list-style-type: none"> Service Orientation/Product Service Offerings Business Process Management Business Change Management Understand and Coordinate Workflows 	<ul style="list-style-type: none"> Network Security IT Architectures Machine Learning
				<ul style="list-style-type: none"> System Development Integrating Heterogeneous Technologies Mobile Technologies Sensors/Embedded Systems Network Technology /M2M Communication Robotics/Artificial Intelligence Predictive Maintenance
		<ul style="list-style-type: none"> Modelling and Programming Big Data/Data Analysis and Interpretation Cloud Computing /Architectures In-Memory DBs Statistics Data Security 		
	Analyzing		<ul style="list-style-type: none"> Problem Solving Optimization Analytical Skills Cognitive Ability 	
Creating and Conceptualizing	Learning and Researching		<ul style="list-style-type: none"> Life-long Learning Knowledge Management 	
	Creating and Innovating		<ul style="list-style-type: none"> Innovating Creativity Critical Thinking Change Management 	
	Formulating Strategies and Concepts		<ul style="list-style-type: none"> Business Strategy Abstraction Ability Managing Complexity 	
Organizing and Executing	Planning and Organizing		<ul style="list-style-type: none"> Project Management Planning and Organizing Work Management Ability 	
	Delivering Results and Meeting Customer Expectations		<ul style="list-style-type: none"> Customer Orientation Customer Relationship Management 	
	Following Instructions and Procedures		<ul style="list-style-type: none"> Legislation Awareness Safety Awareness Individual Responsibility 	

Big Eight	Competency Dimensions	Competencies		
		IS/Economics	IT/Computer Science	Engineering
Adapting and Coping	Adapting and Responding to Change		<ul style="list-style-type: none"> Work in Interdisciplinary Environments Intercultural Competency Flexibility Adaptability and Ability to Change Mind-set 	
	Persuading and Influencing		<ul style="list-style-type: none"> Work-Life Balance 	
Entreprising and Performing	Achieving Personal Work Goals and Objectives		<ul style="list-style-type: none"> Self-management and -organization 	
	Entrepreneurial and Commercial Thinking		<ul style="list-style-type: none"> Business Model Understanding Entrepreneurship 	

Figure 1: "Industry 4.0" Competency Model

3. THE CREATION OF NEW SKILLS: THE ITALIAN NATIONAL APPROACH TO INDUSTRY 4.0

Industry is one of the pillars of European economy since it involves more than 33 million people across more than two million companies in Europe. But it also accounts a strategic component which is much more important than its GDP may suggest. Indeed as Chrisophe Sirugue, the former French Secretary of State of Industry declared, industry accounts for 64% of European R&D, and economists estimate that each additional job in the industry creates between 0,5 and 2 jobs in other sectors.

That is why the evolution of the economic system towards the adoption of Industry 4.0 technologies is supported by diverse policies in many industrialized countries. Many governments have recognized the scope of the digital revolution and have designed specific programs for the development of Industry 4.0.

Obviously, the referential concept as well as the implementation modalities differ in each country reflecting the related industrial, cultural and economic diversities. Each nation has its own industrial tradition, its own way of doing business, its own approach to data privacy and so on.

More than 30 national and regional initiatives for digitizing industry have already been launched across Europe in recent years. Examples at national level are Plattform Industrie 4.0 in Germany, Industrie du Futur in France and Piano Nazionale Industria 4.0 in Italy.

Surely, all the national initiatives recognize the importance of identifying and developing the new skills required and have envisaged strategies on how to develop them. Certainly, it is very hard to predict and develop training contents and profiles for the population affected by present and future transformations and, above all, it is very difficult to prepare trainers able to transfer the new competences.

Italy, which is the second manufacturing country in Europe after Germany, has launched in 2016 the Piano Nazionale Industria 4.0, a plan allocating 13 billions of Euros aiming to:

- 1) reinforce innovative investments (by increasing money in research and development activities and by strengthening financial services supporting start-ups and innovative companies)
- 2) enhance the relevant public instruments (in order for example to strengthen and renew the international market penetration)
- 3) favour the development of the enabling infrastructures (through a plan for developing the ultra-wide band and the collaboration at a European level to defining standards and criteria of interoperability, especially in the expansion of IOT)
- 4) develop competences (through the creation of competence centers and digital innovation hubs, by increasing PhDs and disseminating a 4.0 culture even at a school level).

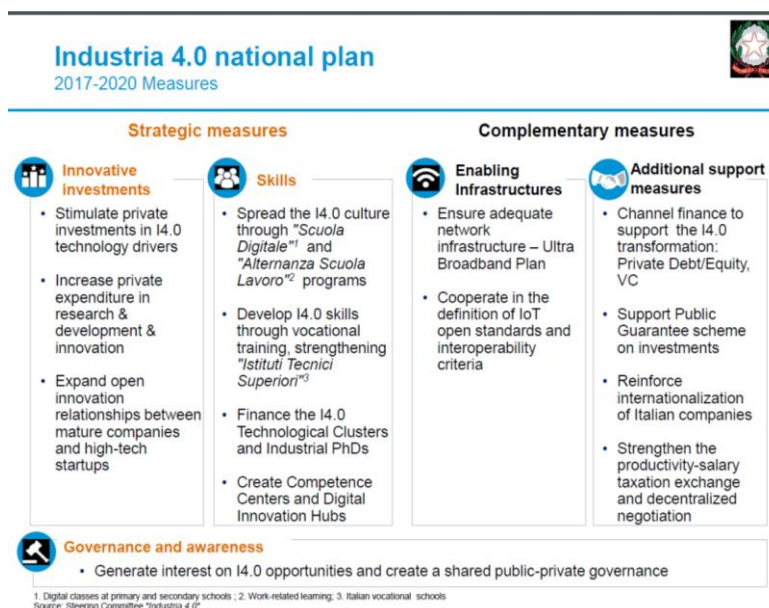


Figure 2: Italian National Plan pillars

A central theme of this initiative is to boost the competitiveness of Italian companies through the development of necessary skills at both vocational and university/school level. In this respect, the initiative has set the following objectives by 2020:

- reach 200.000 new academic students and 3.000 managers qualified on Industry 4.0 topics by innovating study curricula to train student on new digital and Industry 4.0 skills
- have 1400 more industrial PhDs focused on Industry 4.0 topics
- increase from current 9,000 to about 20,000 the number of students enrolled in ITS (Advanced Technical Institutes)
- incentivize training 4.0 to protect and reinforce employment through 40% tax credit on labour costs of personnel following training courses in Industry 4.0 topics
- develop the National Network «Impresa 4.0» made by: a) «Punti Impresa Digitale» (Digital Enterprise Points) based on the national network of chambers of commerce and aiming at spreading awareness and basic knowledge of Industry 4.0 technologies b) *Innovation Hubs* aiming to provide advanced training to specific organizations and coordinate digital transformation and tech transfer structures c) *Competence Centres* that intend to provide advanced training and development of research projects on industrial research

According to Lombardi (2017), despite education is one of the main pillars of the national plan, it is still very hard to notice a real focus on the training process of the operators and the workforce that will be involved in Industry 4.0 for the years to come. He identified the cause in the following reasons:

- the lack of funds
- a “traditional” cultural approach of many stakeholders
- a lack of awareness of the importance to develop new competencies
- the extreme variability due to the rapid evolution of technology and the dynamics of the knowledge in many sectors which force to elaborate training strategies in conditions of high complexity and uncertainty

Actually, a further reason should be added to the list above, i.e. the poor *training of trainers*. The system created has its force and validity but it seems to lack on this specific aspect. Have academic professors the appropriate preparation to convey the new skills? Have teachers from school really understood the scope of digital transformation? Are innovation hubs and competence centres able to provide the proper training to companies?

4. THE USGM SUGGESTED MODEL

In order to face those questions and in the meanwhile the central government defines a roadmap even for the training of trainers, educational institutions have to adapt to the changed conditions and increasingly align their current model of pedagogy with the company requirements.

An example of this attempt is provided by the Università degli Studi Guglielmo Marconi which is closely working with important players from the industrial sector in order to create courses containing contents coming directly from the field. This does not mean that the university simply receive and follow the indications of companies but that both parties work together, side by side and in a concrete way, to the creation of the new competences through a real exchange of knowledge and methodologies. The first experimental project in this respect concerns the agreement signed by USGM and **Baker Hughes, a General Electric Company®** in October 2017 aiming at creating three new courses developed by a joint team formed by Marconi professors (in this case belonging to the Faculty of Applied Sciences and Technologies) and people from the company.

The new courses have the objective of training students on the new competences in line with the digital industrial strategy of BHGE which involves three different areas: Manufacturing, Engineering and Digital Technology. The aim is to create a new generation of professional profiles who are now absent in the labour market: the *engineers 4.0*.

The three study paths, that will offer students a complete overview of the processes and tools necessary to the definition of the product and of its re-use along the whole production chain, are:

- *Product definition for Industry 4.0*
- *Digital Models for Industry 4.0 applied to work stations*
- *Lean Manufacturing for Industry 4.0*

In the first module students will acquire competences especially linked to Industrial 3D Modelling, in the second they will cope with cloud platforms and data analysis (especially in IoT environment), in the third they will learn about lean manufacturing elements and robotics related to industrial applications. The three courses will be part of a new curriculum orientation to be included in the third year of the Bachelor's degree

in Industrial Engineering. The choice of this specific study cycle (Bachelor's degree, 1st cycle) is to give students a realistic chance to access the world of work after three years of study thanks to the acquisition of concrete competencies, in line with the objective of the Bologna Process Reform when launched. Moreover the contents, which will be provided in e-learning modality, will also be offered to all BGHE staff who will be trained directly within the company.

The advantages of this project are manifold since on the one hand the university will offer its students the chance to access fresh and innovative contents that are totally different from the traditional ones so overcoming the dramatic problem of skills mismatch which affects the industrial world, on the other the company will have material well prepared and revised from a didactic and pedagogical perspective to be provided to their resources.

Hence, the agreement represents an innovative model of building and acquisition of Industry 4.0 competences since it satisfies a twofold objective:

1. it provides a tool to qualify the existing workforce and prepare students for a world in rapid and continuing transformation
2. thanks to a reciprocal transfer of knowledge and method, it allows to ensure the training of trainers creating a virtuous circle which make it closer academia and industry in a more decisive way

The final release of the courses is envisaged for early June 2018 whilst the official presentation to students will be held in September 2018.

5. CONCLUSIONS

Before being technological, the Fourth Industrial Revolution is firstly cultural, since it concerns the way of thinking about the industrial goods, the system of working in the offices, the modality of operating in the factories. It affects the relationship and interaction between people and machines and the structures of factories that are increasingly flexible, sustainable and intelligent. It finally regards the relationship among companies since this transformation, born in the big industry, is also permeating the small and medium enterprises (which are the core of the European economic system), modifying the supply chain and the set of competences which are necessary to compete in the market. Surely, who is going to work in this innovative context will not have simply a technical preparation and, above all, will not refer to the traditional learning methodologies.

This will mean that education has to adapt to the changed conditions and has to re-think the current model of pedagogy aligning it with the potential of digitization. In this changing, dynamic and rapid context, a central role is played by universities, especially by those that, driven by the digital transformation, have understood the need to modify university teaching by integrating the traditional learning paths with a set of contents coming directly from the field.

In this respect USGM is trying to reinforce the synergy with companies with the aim to involve them in a direct way in the creation of new contents, in the modernization of its curricula and in the training of its professors through a flexible and agile approach which also allow to rapidly modify and include new inputs in case of new changes and further developments. The university has undertaken this new path in the field of engineering but intends to extend this methodology to other study domains even in the light of creating a community of teachers and company experts characterized by interdisciplinarity and open collaboration which are two further crucial features of the ongoing Industry 4.0 phenomenon.

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CHALLENGES FEMALE EXPATRIATES FACE ON INTERNATIONAL ASSIGNMENTS

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Abstract: *Multinational Companies (MNCs) are faced with many challenges due to globalization. That is why many MNCs are sending expatriates on international assignments in order to properly manage the subsidiary and to make sure that the implementation of the company policies, culture, mission and vision is adequate. Expatriates are a particular group of employees that face different challenges. Based on extensive literature review, this paper researches women expatriates and the challenges they are faced with on international assignments. Furthermore, it reviews the position of women on international assignments and the reasons why are they less likely to be found in the role of an expatriate than men. However, the evidence today shows overwhelmingly that women can and do succeed at working abroad. Having this in mind, MNCs should do their best to plan for international assignments more strategically in order to make sure not to exclude women from international assignments. On the other hand, women can themselves use different strategies to increase their participation in international assignments.*

Keywords: *women, expatriate, international assignment, multinational company, human resource*

1. INTRODUCTION

The Global Relocation Trends Survey (2010) discovered that 17 percent of the international assignees in 2010 were women while according to SHRM (2014) women comprise over 40 percent of the employable global workforce. The focus on expatriates in general and great amount of cross-cultural research arose with globalization and internationalization of business. Today, multinational companies (MNCs) are aware of the role that International Human Resource Management has regarding expatriates.

The purpose of this paper is to describe and explain the most common challenges women are faced with while on international assignments. Furthermore, it will review the position of women on international assignments and the reasons why are they less likely to be found in the role of an expatriate than men.

2. MANAGING EXPATRIATES

With the increase of globalization and internationalization of business expatriates have gained immense importance. With that being said, the role of Human Resource Management (HRM) has shifted to International Human Resource Management (IHRM) and has become of crucial importance to Multinational Companies (MNCs) when hiring expatriates. Stahl, Björkman and Morris (2012) define the field of IHRM broadly to cover all issues related to managing the global workforce and its contribution to firm outcomes. Dowling, Festing and Engle (2013) define the expatriate as an employee who is working and temporarily residing in a foreign country. Brewster, Sparrow and Vernon (2007) conclude that expatriates are used by MNCs as means to transfer the corporate culture and strategy to the foreign subsidiary and be there in the preliminary stages of the operations to transfer competence. In order to maintain integration and effective communication between the foreign subsidiary and headquarters, MNCs tend to relocate their experienced staff and executive managers to international assignments in their foreign subsidiaries (Tayeb, 2005).

2.1. Women and men expatriates

The typical expatriate is still a male figure. Even though studies have shown that there is an improvement in numbers of female expatriates the statistics are still in favor of men and indicate that women still make up a small percentage of expatriates (Feltes & Steinhaus, 1998).

According to White et al. (1992) if women were to work that would be considered as a secondary activity since women would have a job rather than career. The perception of a career has been reserved for men where a career is different than a job in a way that having a career would include repeated actions and behaviors associated to work-related activities where then a personal commitment is included.

Extensive existent literature on the topic of “the glass ceiling” comprises evidence from the USA, Europe as well as Australia and notes that women face challenges in their professional carriers that their male counterparts are not faced with. Furthermore, different reviews and cross-cultural studies have been published and have compared both male and female managers regarding their performance and efficiency. Moreover, the research conducted states that in general female expatriates are successful on their cross-border assignments (Caligiuri et al., 1999).

Selmer and Leung (2002) discovered that women had higher interactional and work-related adjustment than men when investigating the adjustment of both female and male expatriates.

Many studies have shown that women repeatedly have better scores than men when considering emotional intelligence (Schutte et al., 1998; Ciarrochi, Chan, & Bajgar, 2001; Ciarrochi, Chan, & Caputi, 2000). According to Deane et al. (2001), women were found to be more responsive to stressors than men while also willing to reach out to get help from others and use the emotions to their advantage. Thus, the conclusion can be made that generally speaking, women tend to be more emotionally intelligent than men and that can be one of the reasons why female expatriates consistently score better than male expatriates on international assignments (Adler, 1987; Caligiuri & Tung, 1998; Taylor & Napier, 1996).

2.2. Historical background featuring female expatriates

Women came to the spotlight during the late 1970's and early 1980's. Izraeli, Banai and Zeira (1980) confirm that substantial number of journals at the time did not reference women executives in international business. After Adler published her ground-breaking work more than three decades ago (1979, 1984a, 1984b, 1984c, 1987), women expatriates came to focus and many other scientists followed. It wasn't until after the mid-1980s that women were even mentioned regarding the management rankings of international business (Schwartz, 1989; Feltes & Steinhaus, 1998).

In her 1984 research, Adler (1984) reported that out of 13,338 expatriates only 3 percent were women. In 1998, Tung (1998) reported that 13.9 percent in her research were women. The Brookfield Global Relocation Trends Survey (2010) reported that 17 percent of all expatriates were women while the Brookfield Global Relocation Trends Survey (2012) discovered that 20 percent of the international assignees in 2012 were women. The most recent Brookfield Global Relocation Trends Survey (2016) reports that 32 percent of international assignees were women in the consumer products industry. As it can be seen from the existing research made so far, the number of female expatriates in the expatriate arena has been rising. However, women are still underrepresented on international assignments and their participation within international assignments remains significantly lower than men's (Florkowski & Fogel, 1999; Altman & Shortland, 2008).

Even though an increasing number of women seeking managerial positions and women that were successfully pursuing executive carriers, the executive suite was still highly resistant to women's access according to the extensive review of female managers in the global economy performed by Adler and Izraeli (1994). Comparable, a more recent research conducted by Linehan et al. (2003) suggested that even though MNCs might be willing to promote female managerial positions domestically in the hierarchy, very few were ready to allow female managers to take their successful carriers on a higher level, international assignments.

3. BARRIERS FEMALE EXPATRIATES FACE ON INTERNATIONAL ASSIGNMENTS

According to Linehan & Scullion (2004) the specific problems that women expatriates are faced with include: 1) burdens of coping with the role of the “token woman”; 2) being a test case for other women; 3) lack of role models and feelings of isolation; 4) strains with coping with prejudice and sex stereotyping; 5) indirect discrimination from fellow employees and employers; 6) the organizational structure and climate.

Other barriers include lack of mentors and role models – especially women mentors (Linehan & Scullion, 2001), lack of female networking (Varma, Stroh, & Schmitt, 2001) as well as lack of social support (Caligiuri & Lazarova, 2002).

In their research, Vinnicombe and Colwill (1995) discovered that both women and men when asked to describe their model mentors, they choose people very similar to themselves. The same authors also suggest that there are few top-level executives that are women, which further suggests that both female and male managers on lower positions will be most likely mentored by a male figure.

According to Linehan (2001), Linehan and Scullion, (2001b), Linehan et al., (2001) and Westwood and Leung (1994) women do not have access to networks and therefore they have less expatriate opportunities. Linehan and Scullion (2004) state that women expatriates should use their networking capabilities to make

themselves visible. However, that is not an easy task since women are not as included in the organizational networks as men and debate is that exactly these networks that can contribute to acceptance and career advancement.

The "old boys club" is very strong in many different organizations and women are excluded because of the traditions, male customs and the negative perception towards women expatriates, according to Linehan and Scullion (2000). They also differentiate barriers due to female exclusion from the "old boys club", such as: 1) blocked promotion; 2) blocked career development; 3) discrimination; 4) occupational stress; and 5) lower salaries. Breaking into the "boys club" for women is also proven as difficult resulting in women's inability to reach policy information, opportunities, business contacts, social support, etc.

However, operating within these (male) networks and making relationships is crucial to women's breaking of the glass ceiling. Furthermore, networking is shown to reduce bias against disadvantaged groups (Kalev et al., 2006), such as women expatriates in this particular case.

As concluded by Linehan and Scullion (2004) the majority of women managers in Europe are not married, meaning that they're either single, divorced or widowed, or if they are married they do not have children. They state that according to many studies conducted it is usually women who aren't married and don't have children while on the other hand men are married and have children.

According to IRC/ORC Worldwide (2007) and ORC/CBI (1992) women expatriates tend to be single. That adds pressure to women expatriates and they feel they must make friendships in order to minimize social isolation as a part of their adjustment process. Some establishments even operate a double standard for marriage, where a male manager is considered an asset while on the other hand a female manager is considered a liability. It is considered that a male figure has stable home support while a female figure will likely abandon her responsibilities due to prioritizing family over work as suggested by Vinnicombe and Sturges (1995).

According to Linehan (2001) women must put in a lot of work to become accepted but also have less time to do so, especially if they have a family to take care of. Therefore, according to Metz (2005), women who are mothers at the same time would have smaller and less close circles than women who do not have children.

Additionally, it has been recorded that women still experience difficulties with different complex laws regarding women employment especially throughout Europe even though European Union has made an effort to standardize employment legislation (Linehan and Scullion, 2004).

There are also many barriers that often prevent women to climb the senior management ladder such as cultural, legislative, corporate, attitudinal, educational and many other constraints. Of course, these differ from culture to culture. Likewise, the role of an ideal manager differs across societies as well, however in all cultures the role is associated with a male figure rather than a female.

4. CONCLUSION

The purpose of this paper was to examine women as expatriates on international assignments. From summarizing the data gathered from various sources such as journals, reports, articles, studies and researches, a conclusion can be made that the expatriate arena is definitely more accepting of women expatriates but barriers for entry as well as bias are still existent.

There is still a big gap between women and men expatriates. Women expatriates have historically been mentioned in the literature around 1980's for the first time. Since then, many authors have discussed the characteristics, skills, willingness, barriers as well as the satisfaction of female expatriates.

From everything stated in this paper it can be concluded that women are not less competent, capable and knowledgeable than their male colleagues. They seem as ready as they can be to conquer expatriation issues connected with international assignments. As Adler (2002) states, both genders have weaknesses and strengths that are either instinctive or socially conditioned. Therefore, the approach used when investigating this matter should be an optimistic approach - stating that the differences and complementarities of both genders strengths should be celebrated.

Furthermore, Harris (2004) suggests that MNCs need to plan for international assignments more strategically, MNCs need to make the criteria for selection effective for the expatriates and need to carefully review when they are making their selection and make sure not to exclude any groups of employees, such as in this case women while also making sure that the compensation packages are adapted in the way of

encouraging women in international assignments. On the other hand, Fischlmayr (2002) adds that women can themselves use different strategies to increase their participation in international assignments while also using the networks as much possible to their advantage and make sure they let the MNC now they are willing to go on international assignments (Harris, 2004; Linehan, 2000). Women should, according to Adler (2002), also make sure they are at the right place at the right time to make themselves visible when a good international opportunity comes up.

The evidence today shows overwhelmingly that women can and do succeed at working abroad (e.g. Caligiuri and Cascio, 1998; Napier and Taylor, 1995; Stroh *et al.*, 2000). Taking into consideration all aspects and explanations covered with this paper, women must be acknowledged for their constant battle in the expatriate arena while trying to climb the ladder.

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THE USE OF LEARNERS ENGAGEMENT DATA FOR REPORTING: CLUSTER ANALYSIS

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Abstract: *This study consists of learning engagement data analysis using a clustering data-mining technique, with a goal to report the results to an instructor. Clustering is performed based on engagement indicators, which are extracted from log files, attendance data, and the formative evaluation results. Four clusters formed as a result: Enthusiasts, Traditionals, Theorists and The Self-Reliant. The results are presented in a report which can be useful to an instructor who would then be able to orient himself in a virtual setting, form a clearer picture of the student's engagement and develop a distinct approach to the members of each cluster.*

Keywords: *data driven learning, e-learning, learning management, training and development, learning analytics*

1. INTRODUCTION

A "data explosion" in the educational context was recognized even in 1979 when the long-distance learning research was conducted on student success. This research was faced with huge amount of data and lack of adequate data processing tools to cope with (McIntosh, 1979). The quantity of data kept rising over time and this tendency drove the interest for the question at the core of data driven learning (DDL) - what can one reveal about *learning* by analyzing such data? The increase in popularity of the data driven approach in the corporate sector lead to the development of data saving formats, the power of computers and analytical tools also rose (Baker, Inventado, 2014), thus making the technical difficulties of data analysis absolute.

E-learning can lead to an advanced tracking of learner's activities (Welsh, Wanberg, Brown, Simmering, 2003). This tracking is one of the results of the advancement of technology such as web 2.0 (Ferguson, 2012), which can be used to record the interaction of the user with the learning environment. This makes it easier to collect data about the number of sessions in the system, their length, quiz results and time taken to use each learning resource, etc. This "explosion of data" is not complete, as there needs to be a connection between the user and their demographic characteristics. Moreover, adequate sensors can be used to track a person's facial expression, posture, breathing and eye movement (Scheuer, McLaren, 2012). These data sources can give us an opportunity to use a data-driven approach to learning.

Despite the fact that DDL is easier to comprehend in a virtual environment, it is not limited to e-learning. It is possible to turn off the computer and rely solely on traditional learning materials to collect data and make use of DDL. For an example foreign language learning can be done in a traditional setting, relying on traditional materials and still lead to DDL (Boulton, 2010). For a detailed review of research done in data-driven traditional learning, the reader should refer to (Romero, Ventura, 2010).

The literature explored mentions *Learning Analytics (LA)* and *Educational Data Mining (EDM)*. LA is used to understand and improve the learning process and setting through quantifying and collecting data which come from learning, as well as the analysis of this data and reporting to the stakeholders (Ferguson, 2012). EDM consists of automatic pattern-finding and structures in big data-bases. (Romero, Ventura, 2007). The difference between these approaches can be summed into three points (Baker, Inventado, 2014):

- The EDM approach is based on automated methods, while the LA relies on a human operator in data analysis.
- The EDM helps understand the relationship between different structural elements, the LA is characterized by a holistic approach.
- The EDM tends to partially or fully automate processes (e.g. personalized student guidance through a learning environment), the LA focuses on strengthening and informing all participants to take further action.

Clustering is one of the data mining tasks that can help to group objects (in this study learners). Learners in the same cluster share similar characteristics, compared to those in other clusters. In this study, we attempt to find how clustering students according to learning persistence data can be used to improve the management of the learning process. There is an assumption that the report about student engagement can help the instructor (by instructor we mean the one who is in charge of the learning process) adapt learning methods to specific characteristics of each cluster. Moreover, this report can be used to enhance the training and learning process in the HR department. The main limitation of our work is that we did not consider the length of the session, but its frequency.

2. THEORETICAL BACKGROUND

Learners tend to drop out the most when switching between traditional and virtual learning environments. Literature suggests that students attending e-learning courses drop out at higher rates than their on-campus counterparts (Levy, 2007). There is a need for studying learner engagement, whether this behavior is linked to a lack of motivation or disorientation in a virtual environment. The instructors might want to know which learning group would pay more attention to learning resources, quizzes, or whether the group is inactive. The instructor could therefore himself administer the learning process, or it could be automatized.

The analysis we conducted according to the EDM categorization belongs to the instructor's reporting based on learners' behavior and is known as one of the most common tasks in literature (Castro, Vellido, Nebot, Mugica, 2007). The goal of reporting is to overcome some of the flaws of e-learning, which can include feelings of isolation among learners (Mazza, Dimitrova, 2004), or instructor's perplexion (Dringus, Ellis, 2005) who can lose any sense of how their learners gain new knowledge. The reports designed for professors contain relevant information such as: the estimated risk of failure to which the students are exposed to during the course (Arnold, Pistilli, 2012), a cluster to which the student belongs to regarding their interaction with each other (Romero, Ventura, Garcia, 2008), timely alerts of detected critical learning patterns (Singley, Lam, 2005) etc.

In DDL clustering which we used in our analysis, belongs to the most common tasks, following the classification. According to the field review that analyzed 242 works, clustering was carried out in 65. (Pena-Ayala, 2014) The problems that are most commonly solved using one of the clustering algorithms (independently or in combination with other techniques) are: identifying important variables that influence the performance, analysis of the surfing behaviour during the interaction with an e-learning environment, to analyze the web log data files of a learning management system (LMS), how to teach a basic computer skills course to students from rural and urban background etc (Dutt, Aghabozrgi, Ismail, 2015).

Log files in DDL appear as a typical source of data (Romero, Ventura, 2010) when it comes to monitoring students (Mazza, Bettoni, Fare, Mazzola, 2012) or predicting their performances (Romero, Ventura, De Bra, De Castro, 2003, Zacharis, 2015). There are examples of their use to analyze students' engagement. Students at the Tel Aviv University were divided into five groups based on their interaction with the Moodle system, which describe their persistence in a virtual setting (Hershkovitz, Nachmias, 2011). A similar approach was applied to a programming language (HTML) electronic learning system to find the disengaged learners. The goal of this study was to create the preconditions that would adapt the learning environment to their needs, meaning to re-engage them (Cocea, Weibelzahl, 2009).

Log files are not the only source of data for learning engagement analysis. With appropriate sensors, one can track the user's pulse, posture, eye movement and so on. An example can be found in the intelligent tutoring system (ITS) which recognizes disengagement and boredom based on the user's eye movement in an attempt to re-engage the student using virtual assistants (D'Mello, Olney, Williams, Hays, 2012).

3. METHODOLOGY

3.1. Research field and population

This study examined log files, attendance data and formative evaluation results of 62 students. The students at the Faculty of Organizational Sciences, University of Belgrade attended two separate courses: e-Education (39 students) and Training and Development (23 students). Two week-long assignments were given so that they were relevant to students from both courses. Their completion, along with the instructor's feedback, lead to a successful completion of the final project. We used the evaluation data of these assignments in our analysis.

Both groups were given a chance to use the same Moodle course on learning during the 2017/18 winter semester to achieve a part (10%) of their final grade. The instructor intended to give the students a chance to

understand the basics of learning in order to understand more specific concepts such as e-Education and Training and Development. This course was available during two weeks and all students completed it. It contained four learning resources and four quiz evaluations, where each resource was dedicated to a specific quiz and contained all the necessary information for completing the quizzes successfully. The students could access each resource and quiz as many times as they wanted, since the goal of the online course was that all students understand general learning concepts. As a result, we gained a diverse student-quiz, student-resource and student-learning-system interactions data.

3.2. Log files

Moodle's log files consist of user actions taken within the course. For an example, actions might consist of viewing the resources and quizzes. Each row in the log file consists of a triplet describing the user, action and time. In total, 4 844 records of 62 students were logged.

3.3. Variables

We extracted multiple variables that show a level of student engagement during learning based on the log files, attendance data and formative evaluations. The System Interaction (INT) consists of the number of times a student has accessed the system, which includes the number of logins, the use of resources and course navigations. The Resource Interaction (RI) consists of the number of times that a student has accessed the learning resources. There are two variables that describe the student interaction with the quizzes: the Quiz Interaction (QI) which shows how many times a student accessed the quiz, looked at the questions and changed their answers, and the Quiz Submissions (QS), which is the number of submissions by which the user confirms that they are satisfied with their answers and asks for the number of points. We extracted the two variables to show differing behaviors during the studying process. There were students who submitted the quiz multiple times and chose random answers to maximize the number of points in one of these attempts. This assumption is supported by past analysis, which recognized such behavior as well and called it cheating the system (Baker, Corbett, Koedinger, 2004). However, some students characterized by a high level of quiz interaction do not always intend to check their answers by submitting them. They might want to navigate through the quiz in order to find the right answer or because they keep changing their minds.

Three more variables were extracted from a traditional learning setting: Attendance (ATT), Formative Evaluation 1 (FE1) and Formative Evaluation 2 (FE2). The first assignment was theoretical (an essay), the second was more practical (making e-learning materials). We made the assumption that the instructor could use the report if they knew which student engaged with which assignment better.

3.4. Data preparation and modeling

During the preparation phase and modeling we assumed that the results of the analysis should be dedicated to the instructor. This means that the report has to be understandable *and* informative to them. We used the RapidMiner Studio, a data-mining software platform, for data processing. Using the log files, we measured the frequency of the interaction with the learning environment, learning resources, quizzes and quiz submissions. These variables, in combination with variables collected from a traditional environment (attendance and weekly results), make up all variables used for this study. The data was discretized by frequency to adapt the report to the instructor's needs. The numerical values were transferred into nominal values by putting each of the numerical values into a finite number of groups (in our case three: below average, average and above average). The discretization of formative evaluation was performed separately for the group that attended the e-Education and the Training and Development course.

Then, the nominal values were turned into numerical values for the needs of clustering. The learner who attended the class below the average value of their peers would be labeled with a 0 in that variable. If their attendance is around the average they would get a 1 and a 2 if it is above the average. The k-Means algorithm was used for clustering. We chose 4 clusters, based on the average cluster distance. The number of max runs was set to 10 and the measure types on numerical measures. At the end, the intra-cluster distance is checked by using Cluster Density Performance operator.

3.5. Ethics

Ethical issues are considered during this research. The de-identification of data was done in data preparation process. Students were informed that data will be used in purpose of knowledge discovery. The both groups had an opportunity to attend the lecture on data driven learning and present students were called to take a role in the discussion about ethical aspects of this field. After all we considered the students' consents as well informed.

4. RESULTS

We extracted four clusters that represent structures that had specific characteristic so that they would be useful for the instructor. The clusters were named based on the centroids characteristics (shown in Figure 1): Enthusiasts, Traditionals, Theorists and The Self-Reliant. The report should not be used to evaluate learners but to create adapted learning environments and approaches to learning.

The most numerous clusters are Enthusiasts and Traditionals. They both contain 21 students each. Theorists have 15 and the Self-Reliant 5 students. The Self-Reliant cluster is significantly smaller than the others, but is kept in this analysis due to the specific behavior that it describes. A further analysis showed that this group of students was derived from the *Theorists* cluster, meaning that if there were 3 clusters, these students would belong to Theorists. The characteristics of each cluster can be found in Figure 1, in a form that is easily read and dedicated to the instructor. The average within cluster distance is -34.14 while intra-cluster distance for each cluster can be found in Table 1.

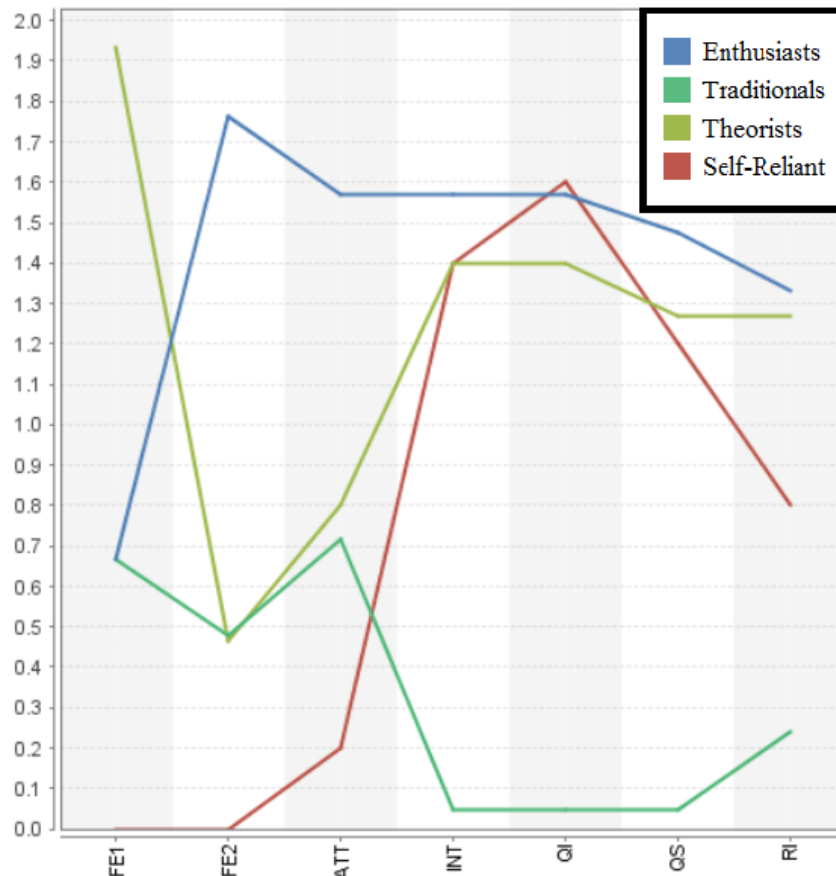


Figure 1: Centroid chart

Table 1: Average within cluster distance

Enthusiasts	-41.426
Traditionals	-38.366
Theorists	-26.996
The Self-Reliant	-7.221

Enthusiasts are characterized by high values in all engagement indicators except for the first week's assignment. The enthusiasts were highly engaged, whether they learned in a virtual or traditional environment. They have better results in a traditional setting on the second assignment and attendance than other clusters, but have worse results in the first formative evaluation. This deviation from engagement in this indicator can be interpreted as an inclination to practical assignments (the first one was more theoretical) or a tendency to estimate the situation before engaging (the first assignment was at the beginning of the semester). The Enthusiasts had the highest scores on the virtual environment variables, except the Quiz Interaction variable. This shows that they might have been well-prepared for the quiz, since they had a high learning resource interaction.

Theorists are similar to enthusiasts in that they are active in a virtual environment. They have a highest score on the *theoretical* assignment, but the lowest score on the *practical* assignment. Since e-learning was based on reading theoretical texts in a virtual environment in this course, we assume that this shows a tendency for

thorough reading and writing. Moreover, their interaction with the resources is not much different than the Enthusiasts'.

The Self-Reliant, the students who belong to the third cluster, have a rich interaction with the system. However, their interaction focuses on the quizzes and they decided to ignore the given resources. Their attendance was below the average value and they did not complete the weekly assignments. An instructor who has no access to a report on the students' performance might label this behavior as disengagement. Based on the findings in the Self-Reliant cluster, we can conclude that they might be autonomous, meaning that they do not rely on provided learning resources. As the number of submitted quizzes is not high, these students did not simply guess their answers hoping that they would get the right answers, but put effort into finding their own, to us unfamiliar, learning resources.

We found a group of students who were the most active in a traditional learning setting, in contrast to other clusters. *Traditionals* have low scores in all indicators including the lowest score in learning in an e-learning setting. They have low scores on formative evaluations, but are present during lectures, meaning the instructor can approach them in the classroom.

4. CONCLUSION

The report about learners' engagement based on the data about their activity can be useful to the instructor to gain new information about the learner, that can be hardly noticed in the classroom. Contrary to what is shown in the literature (Levy, 2007) some learners were more active in a virtual environment, the instructor without this report might consider the members of the *Self-Reliant* cluster as disengaged based on their behavior in a traditional setting. A more detailed description of these learners might lead to designing a better learning approach, which might aid these students.

The instructor can provide guidelines on how to use scientific search engines to self-reliant students to maximize their learning outcome, instead of just providing a final list of learning resources. Members of this cluster could work with Traditionals, who are a complementary cluster with contrasting weaknesses and strengths. Other than a partner who feels comfortable in an electronic environment, the instructor could also aid Traditionals by giving them traditional learning materials. The instructor should at least provide basic concepts this way in order to increase possibilities to learn.

Enthusiasts and Theorists could also benefit from group learning, since they belong to complimentary clusters. While the first group is good at solving hands-on assignments, the other achieves great results in theoretical ones, thus increasing the chances of successfully completing a course for members of both clusters. For Theorists, who are typically not very attentive in class, the instructor can use a virtual environment to assure the acquisition of key concepts. The report gives the instructor freedom to act however they seem fit with the Enthusiasts, since they show above-average scores in almost all categories.

The mentioned actions are suggestions for the instructor, who can decide how to use the report to benefit the class. A complete list of all the possibilities to adapt the learning process is by no means given in this study. The instructor could justify challenging or supporting members of certain clusters depending on the pedagogical/andragogical paradigm and a context in which the learning occurs to achieve the desired results.

The DDL approach stands as one of the tools that the instructor could use to manage the learning process. The instructor could gain insights into the classroom that is in line with the literature, but can also see that the group (or cluster) is governed by different rules. A special advantage is that learning management that is supported by evidence gains a quantified ground, which can be used in justifying decisions, for an example to manage the business organization. This approach calls for interdisciplinarity to supplement the knowledge gained from data by using differing sources such as the instructor's experience and the learning sciences.

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