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ICT in education
Lifelong learning
Business and technologies
New trends in management
Teaching methods and programs

Table of Contents

3 From the Editor

Teaching methods and programs

4 Version 2.0 of the individual style of conducting classes by an academic teacher in the context of contemporary changes and trends in education

Andrzej Rozmus, Olga Kurek-Ochmańska

ICT in education

10 The eye-tracking technique in the analysis of mechanisms for solving algorithmic problems

Magdalena Andrzejewska, Anna Stolińska

Lifelong learning

19 An intuitive app generator and accompanying e-learning modules as examples of successful assistive technology

Magdalena Brzezińska

27 Development of soft skills as a part of an LSP course

Joanna Kic-Drgas

New trends in management

37 Smart skills and education in a future economy

Franciszek Kutrzeba

44 The Characteristics of Generation Z

Anna Dolot

51 Networking activities of general judiciary – from theory to practice

*Przemysław Banasik, Sylwia Morawska,
Monika Odlanicka-Poczobutt*

Education worldwide

60 Innovation and experiments at OLC Innovate 2018

Maria Zajac

63 International project-oriented training of engineers based on the example of the European Engineering Team

Bartłomiej Gładysz, Elżbieta Jarzębowska

73 The “flipped-hybrid” classroom: A didactic technique for teaching foreign languages

Jeremy W. Bachelor

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Dear E-mentor readers,

In 2017 we published the first ever international E-mentor issue entirely in English. It was very well received and therefore we decided to continue such efforts. So, I have great pleasure to present the new international issue of our journal – number 2(74)/2018.

As previously we succeeded in collecting the articles dealing with both the theory and practice of contemporary education in its lifelong span. In two papers the characteristics and the set of necessary skills of new generations are discussed. Two other papers refer to the skills required at the workplace – digital competences and the language skills; the latter described from LSP (Language for Special Purposes) perspective. The section oriented on competencies includes also a very interesting presentation of the model of individual teaching style in the context of contemporary trends in education, especially the proliferation of learning by ICT. The authors define several groups of competencies that, combined together, constitute the image of modern university teacher. The other three papers are more oriented towards the examples from practice. One of them presents a very interesting concept of flipped-hybrid classroom as a didactic technique for teaching foreign language, while the others refer to the international projects that would not be possible without the use of information and communication technologies. We also have a brief description of the impressions from OLC Innovate 2018 conference, held this April in Nashville, Tennessee prepared from the perspective of its virtual participant.

We do hope that the attempts to broaden access to the valuable content of our journal shall be well-received by our readers as well as the potential contributors. Two other English issues are to be published before the end of 2018 and we intend to continue the project also in the coming years. Researchers and teachers – especially those representing higher education – interested in publishing with E-mentor may refer to the brief guide for authors published on the one before the last page of the journal. More detailed instructions and the submission form can be found online at: http://www.e-mentor.edu.pl/eng/page/8/Info_for_Authors.



Maria Zajac
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Version 2.0 of the individual style of conducting classes by an academic teacher in the context of contemporary changes and trends in education



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Olga
Kurek-Ochmańska*

Introduction

The vast majority of contemporary students are people born after 1995. This generation is defined in journalistic publications, as well as in the sociological literature, as the generation “Z” (the term generation “C” is also used and has been coined from the English words “connect, communicate, change”). This generation has come to know, love and embrace modern technologies and together with the generation “Y” (people born between 1980 and 1995) they create the generation of so-called digital natives (Sajdak, 2015, p. 17). These days, they are the “native speakers” of the digital language (Prensky, 2001, p. 2). Young people, in order to communicate, in a natural way and without further instructions, use the internet, mobile devices and social media, where they create personalized networks of friends, colleagues and similarity groups (Pew Research Center, 2014, pp. 5-6). The omnipresent e-environment and people’s constant interaction with it caused that students from the generation Y, and especially Z, think and process information in a different way than their predecessors. The issue has become one of areas of the interest of neuroeducation (also referred to as – *mind, brain and education* or MBE). This fast-growing field of science, brings together *neurobiologists, neuropsychologists, psychiatrists conducting clinical research, logicians, mathematicians, physicists, cybernetics and computer scientists, who deal with neural networks and artificial intelligence, as well as educators, sociologists, linguists, philosophers and cultural anthropologists* (Juszczak, 2012, p. 40). Their task is to examine the optimal teaching and learning process from the perspective of brainwork, through the exploration of interactions between biological processes and education. This area of interest of

neuroeducation, also includes the issue of the impact of modern technologies on teaching and learning processes (Hon Wah, Chi-Hung, 2013).

When analyzing the impact of the development of technology on education, one should consider the overall psychosocial and cultural factors conditioning the learning processes (Busso and Pollack, 2014, pp. 6–8). Awareness of this complex environment of “teaching” and “learning” should be the foundation of a good workshop of an educator. The aim of this article is an attempt to create a model of individual style of a lecturer’s teaching methods at the end of the second decade of the 21st century.

Individual style of conducting classes 2.0

Following the work of Anna Sajdak, four paradigms in the field of academic didactics: behavioristic¹, humanistic², critical and emancipatory³ and constructivist (Sajdak, 2013, p. 301) have been distinguished. These paradigms are the source of justification for didactic activities – in relation to the goals and methods of education as well as shaping the appropriate role of an academic teacher. The concept of *individual style of conducting classes*, described in the further part of the article, is inscribed in the constructivist paradigm, probably the most prevalent in academic didactics. Without going further into the details of the theoretical sources of constructing the constructivist paradigm, one can point out several elements, which – from the point of view of this paradigm – characterize the learning process. These include:

- a) the assumption that education is an activity of a student and a teacher in the area of development,

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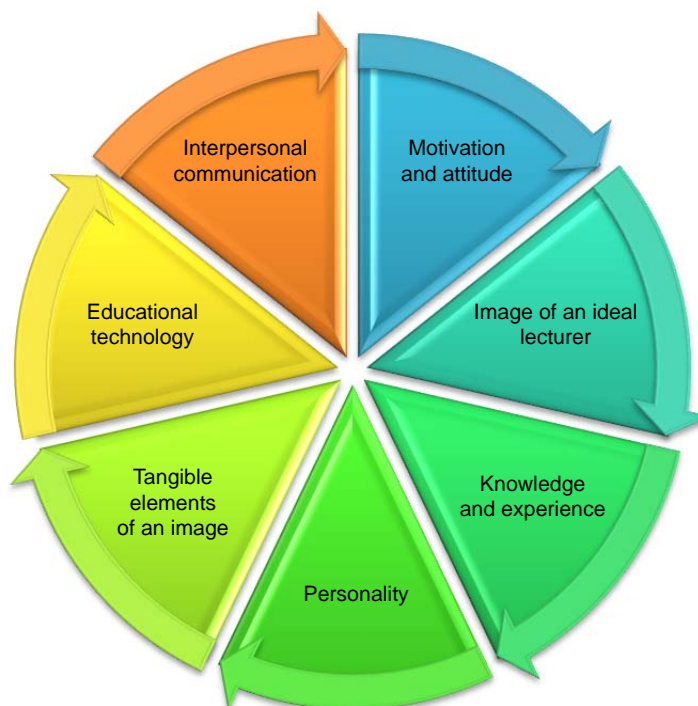
¹ The behaviourist paradigm – also called positivist – based on the concept of a man as an externally controlled machine and utilising behavioural patterns of teaching and learning (Sajdak, 2013, p. 301).

² The humanistic paradigm that treats a man as a free, self-controlled person, who develops in accordance with their natural potential. It is an image built upon a humanistic psychology, personality learning patterns and strategies for promoting personal development (Sajdak, 2013, p. 301).

³ The critical and emancipatory paradigm sees an academic teacher as a „deconstructor of reality”, an entity that fully autonomously constructs their own professional role (Sajdak, 2013, p. 301).

Version 2.0 of the individual style of conducting classes...

Figure 1. Components of individual style of teaching_1.0



Source: A. Rozmus (2012), Indywidualny styl prowadzenia zajęć. *Wykładowca doskonały. Podręcznik nauczyciela akademickiego*, p. 87.

- b) the perception of learning as a process of mastering cultural tools,
- c) the agreement that learning is situational, i.e. it takes place in a specific situation that is significant both for the nature of learning and for its results,
- d) understanding the role of a teacher as the one who facilitates a student by arranging an educational environment that is rich in experiences (Filipiak, 2012, pp. 23-24).

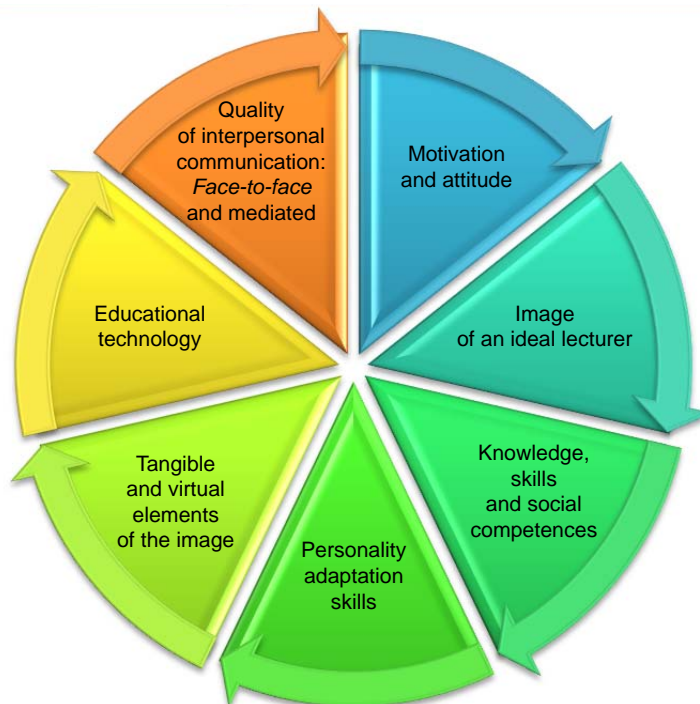
As Anna Sajdak puts it: *Supporting the development of academic teachers in the constructivist paradigm is primarily characterized by the orientation to initiate a change in personal beliefs about academic didactics and students' own practice* (Sajdak, 2013, p. 417). A certain technique or the style of conducting didactic classes is – according to the constructivist paradigm – a replication of a reflective action.

For the first time, the “concept of an individual style of conducting classes” (ISCC) was presented in 2010 in an academic textbook *Wykładowca doskonały* [Excellent Lecturer] (Rozmus, 2010, pp. 87–119). In this concept, the elements of ISCC (figure 1) have been described in the context of an effective teaching message, i.e. how it should be perceived and in which direction one should be developing in order to achieve the desired state (educational value). At the same time, the fact that the ISCC consists of many different elements makes it a unique emblem of every lecturer; their unique coat of arms.

After a few years, however, it seems that this concept requires refreshing. Despite the fact that since

2010, broadly understood IT technologies (or the so-called new media) have already had a significant impact on the education process, nowadays they also „create” a specific recipient of educational content. Thus, a contemporary lecturer, while building their individual style of conducting classes, must also consider not only the characteristics of their recipients, but also the real and virtual world that they live in. With that said, the highlighted elements in the original ISCC concept require redefinition and modification (figure 2).

Personality and adaptation skills of a lecturer. *Personality is understood here as a whole complex of thoughts, emotions and behaviors, which provides the direction and the pattern (cohesion) to human life. Similarly, with regard to the body, the personality consists of both cognitive structures and processes, and reflects the action of the same nature (genes) as the environment. The notion of personality also includes the temporal aspect of human functioning, the personality contains memories of the past, mental representations of the present as well as ideas and expectations about the future* (Pervin, 2005, p. 416). In the 21st century adaptive abilities become extremely important in many areas of human life and are associated with one's personality. They can be understood as the ability to recognize the changes and cope with them in a positive way by modifying one's own thinking, attitude or behavior (enGauge, 2003, p. 35). These skills are also associated with the ability to manage complexity and self-directedness. A contemporary lecturer, to use Bauman's (Bauman, 2006) phrase of the era of “liquid modernity”, should

Figure 2. Components of individual style of conducting classes_2.0

Source: authors' work based on A. Rozmus (2010), Indywidualny styl prowadzenia zajęć. *Wykładowca doskonały. Podręcznik nauczyciela akademickiego*, p. 87.

therefore possess highly developed adaptive abilities, since both the didactic environment and the subject of educational activities are changing dynamically.

The motivation and attitude of a lecturer concern the needs and goals, the beliefs about themselves and the world. Among numerous theoretical approaches to the issue of motivation, the concept of Frederick Irving Herzberg seems interesting and relevant. According to Herzberg, a key role in building a positive attitude to work is a sense of personal development and self-fulfillment. It is influenced by such factors as: achievement, recognition, opportunities for development, promotion, responsibility and work as a value in itself (Adair, 2000, p. 85). The level of motivation, and hence the degree of engagement of a lecturer, is influenced by many factors, including:

- a) a clear and lasting set of values and ideals that shape their actions regardless of social conditions,
- b) permanent analysis of their own experiences and abilities as well as constant assessment of the context of their work,
- c) a strong sense of identity and the ability to cope with external restrictions,
- d) an intellectual and emotional commitment (Day, 2008, p. 94).

Knowledge, skills and social competences of a lecturer depend on their education, seniority at the university, scientific and research activity, supplementary education as well as professional and life experiences. At this point, it is necessary to mention

a category, which is well-defined in the pedagogical literature, namely the ambivalence of the teacher's professional role. Today, the term "ambivalence" is usually understood as "oscillating" and following Anna Sajdak, it has *nothing to do with the pejoratively understood instability, as much as with the need to reconcile opposing reasons, requirements and expectations. Ambivalence is a characteristic of the inability to make an unambiguous decision in a situation of being the part of conflict of opposing forces* (Sajdak, 2013, pp. 187-188). In accordance with this theory, there is a constant tension between the role of an academic teacher and the role of a researcher. It is a specific game between the requirements related to didactic duties and the goals of scientific development set by the university. In extreme cases, we can talk about conflicting normative expectations assigned to a given role (Bereźnicki, 2009, p. 122). For an academic teacher, the first year of work at the university is the beginning of the process of forming their own didactic identity. Strategic factors include: openness to new experiences, variety of assigned tasks in the university environment, receiving support from other research and teaching staff, financial conditions of work at the university and relations with the superiors (their attitudes, degree of control and expressed expectations).

Quality of interpersonal face-to-face and mediated communication. Interpersonal communication is influenced by four contexts:

- semantic (a summary of acts of communication preceding or coexisting with the main act),

Version 2.0 of the individual style of conducting classes...

- interpersonal (complexity of relationships that connect participants of communication),
- task-oriented (fields of activities which involve communication, e.g. education, work, play, etc.),
- cultural (common non-linguistic experiences of people involved in communicating or their lack) (Nęcki, 2000, p. 29).

It is obvious that every lecturer, while communicating with the group, uses both non-verbal means of communication (tone of voice, vocal qualities, pitch of voice, gestures, movement, appearance, mimic expression, touch) as well as verbal ones (spoken word and written words). However, it is important to distinguish between interpersonal *face-to-face* and mediated communication (i.e. via social media or online platforms). The latter requires proficiency in the communication on the internet (CMC – *Computer-Mediated Communication*), the knowledge about the impact of the internet and computers on society, network sociology, application of artificial intelligence in communication, the theory of virtual reality, and finally security and privacy in electronic communication⁴. In this context, the term “interactive communication” appears, that is, the use of a wide range of media and technologies. It requires from the participants to have proficiency in the use of electronic media (enGauge, 2003, p. 47). In recent years, the role of the so-called *teaming* and cooperation has also been discussed. *Teaming* is a situation in which individuals have a common goal, their cooperation provides unique opportunities in order to achieve it, and their work takes place in an organized environment (Fransen, 2012, s. 253)

Image of an ideal lecturer. *The ideas about the role of a lecturer* and the images of educators, who have become one’s authorities, either based on past or present experiences that are stored in one’s mind have undoubtedly influenced the development of an individual style of conducting didactic classes. For a lecturer, these types are an ideal signpost in their professional development.

Tangible and virtual elements of a lecturer’s image. A tangible image of a lecturer consists of: their superficiality, smell, clothing and the so-called accompanying items (a bag, pen, laser pointer, tablet, smartphone, etc.). However, a virtual image is created on the basis of social media, instant messaging or educational platforms. Lecturers can build their image on Facebook, LinkedIn, Twitter, the Blackboard platform or in hundreds of other applications and programs.

Educational technology. The last component of the individual style of teaching – educational technology – includes such elements as: the construction of classes, didactic tools, arrangement of the learning space and the use of modern technologies in teaching. Contemporary lecturers have a very wide range of standard and non-standard tools at their disposal, as well as various techniques and methods that support the teaching and learning process. Following the development of modern technologies, they can apply in their classes e-learning or blended learning approach using the virtual learning environment (VLE e.g. Blackboard or Moodle) or implement simulations and decision-making games in order to facilitate the process of teaching and learning. What they will choose as their teaching apparatus will affect their image. On the one hand, students appreciate lecturers who are up to date with technological novelties and apply them in classes, on the other – they can appreciate the traditional approach to education as being the art of teaching. However, an academic teacher who uses modern technologies during their classes (as well as the methods and techniques of classes based on them) will be perceived by students as modern, trendy, or simply “current and contemporary”.

Through the analysis of the literature and the websites of individual universities in Poland, one can notice a clear interest in introducing many innovations in the didactic process, e.g. using gamification mechanisms⁵, design thinking (methods of creative problem solving) or m-learning⁶ (learning with the use of mobile devices, the internet and mobile applications). All this has a significant impact on the nature of the role of a contemporary lecturer, however, it also poses a challenge to their image: “If you want to be perceived as current and contemporary then you should introduce innovations into the didactic process and take advantage of the fruits of technological development.”

Summary, i.e. the changes in a nutshell

An academic teacher, while working on their individual style of conducting classes at the end of the second decade of the 21st century, must accept the fact that the changes in various areas of human life (caused by the current omnipotence of the internet), often in a tangible and irreversible way, have also forced to redefine the teaching and learning process. Therefore, the components of an individual style of conducting classes have been transformed. Table 1 lists the ISCC

⁴ More information on this topic can be found in the following publication: M. Szpunar (2017), *Imperializm kulturowy internetu*; idem, (2012), *Nowe-stare medium. Internet między tworzeniem nowych modeli komunikacyjnych a reprodukowaniem schematów komunikowania masowego*.

⁵ Among others, the following authors have written about it: Pawłowska, O., Pawełczak, M. (2014), E-learning na fali przemian, *e-mentor*, 5(57), pp. 40–42, DOI: 10.15219/em57.1139; Borowski, R., T. Kopczeński, T. (2015), Wykorzystanie programu LabSEE do tworzenia eksperymentów ekonomicznych online, *e-mentor*, 4(61), pp. 38–44, DOI: 10.15219/em61.1199.

⁶ More about m-learning has been written by, among others: Lubina, E. (2007), M-learning w strukturze metodycznej e-learningu, *e-mentor*, 5(22), pp. 27–30; Chojnacki, L. (2006), Pokolenie m-learningu – nowe wyzwanie dla szkoły, *e-mentor*, 1(13), pp. 23–27.

Table 1. Transformation of components of individual style of conducting classes

Individual style of conducting classes in version 1.0	Individual style of conducting classes in version 2.0	The field that requires transformation/area of special attention of a lecturer
Personality of a lecturer	Personality and adaptation skills of a lecturer	Development of adaptive abilities, i.e. the ability to recognize and deal with change in a positive way by modifying one's own thinking, attitude or behavior
Motivation and attitude of a lecturer	Motivation and attitude of a lecturer	Permanent analysis of one's own experiences and abilities as well as constant assessment of the context of work
Knowledge and experience of a lecturer	Knowledge, skills and social competences	Shaping the so-called social maturity based on responsibility and autonomy
The quality of interpersonal communication	Quality of interpersonal face-to-face and mediated communication	Identification of differences between individual generations of students (X, Y, Z) and paying close attention to the quality of interpersonal mediated communication (e.g. through social media or online platforms)
Image of an ideal lecturer	Image of an ideal lecturer	Constant monitoring of the achievements of other lecturers and openness to possible change of the previously adopted „image of an ideal lecturer”
Tangible and virtual elements of an image of a lecturer	Tangible and virtual elements of an image of a lecturer	Paying attention to a virtual image created on the basis of social media, instant messaging or educational platforms
Educational technology	Educational technology	Keeping the track of the development of modern technologies, in terms of their possible use in the didactic process and constant work on didactic innovations

Source: authors' findings.

components in version 1.0 and 2.0 (the latest) and the so-called fields that requires transformation, i.e. the areas to which a lecturer should pay their particular attention are indicated.

Finally, it is worth to highlight that not only the way of forming the ISCC, but also the role of a lecturer in itself requires reflection. On the one hand, students have enormous and diverse opportunities to acquire knowledge, on the other – they are sometimes confused, have no competence to differentiate between *false information, partially false or an incomplete one* (Piecuch, 2016, p. 111), thus more often than not they uncritically accept it. Therefore, it seems that one of the key tasks of a lecturer should be to facilitate students in the ultimate settlement of the truthfulness and reliability of different sources of information.

One thing is certain – in the face of such broad opportunities and changes in the educational environment, an academic teacher must redefine their style of conducting classes and not to allow to disregard the process of its continuous improvement.

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Abstract

Generations Y and Z are constantly associated with new technologies, so it causes them to think and process information in a different way than their predecessors.. It is extremely hard to state clearly how many benefits and how many problems modern technology brings to the process of learning. On the other hand, technological development cannot be stopped. Therefore, it is necessary to learn about technology and to accept it without negating other factors influencing modern education, like psychosocial and cultural factors. A good academic lecturer should be aware of this close relationship between new technologies and the way in which modern students are learning. The main goal of this article is to try to build a model of an individual style of academic lecturer teaching at the end of the second decade of the 21st century. In version 2.0, the individual lecturer workshop consists of a) the personality of the lecturer and his/her adaptive skills, b) motivation and attitude, c) knowledge and skills in social competences, d) the quality of interpersonal communication (face-to-face, indirect communication), e) the image of an ideal lecturer, f) tangible and virtual elements of the image, and g) technology used in teaching. The contemporary lecturer creates his/her own style of teaching during classes. Firstly, he/she should adjust the tools for transferring knowledge to the students and their perceptive abilities. Secondly, he/she ought to help them in the final settlement of truth and the reliability of sources of knowledge.

Key words: individual style of academic teaching, teaching at the higher education level, generation Z, trends and innovations in learning.

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The eye-tracking technique in the analysis of mechanisms for solving algorithmic problems

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One of the basic objectives of education is the intellectual development of children and young people, allowing them to prepare, among others, to be able to solve problems in various areas of life. This aspiration has been expressed during the recent works on the reform of education in Poland and in the core curriculum, which was approved in February 2017. It was highlighted there that IT education offers a wide range of possibilities to achieve this goal, and the appropriate means for its accomplishment is teaching programming, understood not only as learning how to write a code, but as a process of acquiring the IT approach skills to solve problems. Such understanding of IT education is not new, for many years researches have been indicating the importance of educating this special way of reasoning, which is called computational thinking. It is well-known, however, that learning algorithms and programming bring some difficulties for students at different ages. Therefore, a number of studies have been undertaken, whose aim is not only to identify the causes of these difficulties, but also to optimize the learning process by selecting appropriate teaching strategies. With that aim in mind, researchers seek for new techniques that would expand the knowledge about how brain works and allow the insight into the neurobiological aspects of the learning processes.

Introduction

Computational thinking is not as much associated with the ability to use ready-made algorithms, as with the use of certain procedures during the discovery of solutions to specific problems. The new core curriculum (effective since 2017) assumes that within the framework of computer science subject students will acquire the ability to analyze and solve problems in a strict, orderly manner, while maintaining the algorithmic rules of conduct – from the specification of a problem (specifying data and results and more generally – to solving the problem), by finding and developing a solution, programming the solution, testing its correctness and making possible adjustments by using a properly selected application or

programming language (Reg. MEN, Journal. from 2017, item 356, vol. 1). Importantly, this algorithmic way of thinking, which Futschek (2006, pp. 159–168) wrote about, seems to be an intermediate step to achieve computational thinking skills, in which the fundamental concepts for computer science are used to solve problems, design systems, and even help with the understanding of human behavior (Wing, 2006, pp. 35–36).

Teaching algorithmics may be one of the first steps necessary to educate an IT approach in students, in order to solve problems they encounter in different life situations. However, many studies show that not only the creation of new algorithms, but also the analysis of ready-made solutions and their implementation in a programming language are difficult tasks for students (Moström, 2011, p. 7; Govender, 2006, p. 28).

The variety of problems connected with teaching algorithmics and programming (resulting both from their universality and scope) prompts to use new research techniques, appropriate for cognitive sciences, so that the analysis of cognitive processes (e.g. observational processes, including visual attention or cognitive load) would allow to find causes that prevent or hinder the acquisition of programming skills. One of such methods, which in the recent years has been more and more often applied in research projects analyzing the process of expanding knowledge, is eye tracking – a technique involving the registration of visual activity (Lai et al., 2013).

Research conducted using eye tracking, which may apply to teaching programming, focus primarily on the mechanisms of program code analysis. Researchers most often show interest in the exploration of processes that occur during programmers' activities such as code editing (reading and writing), its compilation and debugging. The studies conducted by Crosby and Stelovsky (1990), in which they compared the eye tracking data of novices and advanced programmers, and whose aim was to check how the experience affects the patterns of processing the

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The eye-tracking technique in the analysis of mechanisms...

code (*code scanning patterns*) during its interpretation, can be considered pioneering. Behavior patterns during the code analysis were also investigated by Uwano et al. (2006). They noticed that when searching for errors in most of the surveyed programs, the majority of respondents first pre-read the entire code (probably in order to understand the structure of the program), and only then their focus was placed on the selected parts of the program. Moreover, the time spent on this initial code scanning had an impact on the effectiveness of error detection. The studies conducted by Sharif et al. (2012) have led to similar conclusions and additionally they have shown that the time spent affects the visual effort (measured by the number and time of fixation) needed to indicate errors. Furthermore, they observed that the experienced programmers devoted less time, as compared to the novices, to pre-scan the program before searching for actual errors. Continuing the research on these issues, Busjan et al. (2015) showed that the analysis of a program content is a non-linear procedure, and experts read the code in a less linear way than novices. In turn, Bednarik and Tukianinen (2006) recorded the oculomotor activity of students during the analysis of Java language codes in the programming environment, which provided, apart from the code editing tools, the visualization of its execution. The aim of this experiment was to examine the dynamics of student interaction with various forms of program representation during its analysis (understanding of the operation) and to compare whether these processes are similar in people with different levels of experience. The results of eye tracking studies also show that the process of reading the source code of a program is fundamentally different from reading a natural language text, however, these discrepancies are less apparent if the program code becomes similar to the text written in natural language (Busjan et al., 2011; Binkley et al., 2013). There were also studies conducted to answer the question: how code formatting, including syntax coloring affects the efficiency of its analysis (e.g. searching for syntactic errors) and its understanding (e.g. determining the result of the program). It was found that the appropriate spatial structure of the source code allows for its faster understanding, regardless of the style of naming the identifiers (Binkley et al., 2013). It was observed that syntax coloring shortens the task execution time (Dimitri, 2015) and it was found that this effect decreases with the increase in the level of programming experience (Sarkar, 2015).

So far there are only few publications on the research of mechanisms for solving algorithmic problems with the use of eye tracking as a research technique (Andrzejewska et al., 2016). The enrichment of knowledge in this area seems to be very necessary, because the lack of control over competences related to the representation and construction of algorithms is widely recognized as the primary cause of difficulties associated with programming learning (Gomes

and Mendes, 2007). Conducting research in this area is also a response to the demands contained in the already cited study by Lai et al. (2013), whose authors emphasize that educational issues such as reasoning and skills acquisition, still require exploration.

The article presents the results of authors' own research, in which the state of declarative and procedural knowledge of students, associated with the forms of presentation and analysis of algorithms, was diagnosed. In the study procedure, the eye tracking technique was used as a complementary to the traditional methods, by means of which the students' oculomotor activity was recorded while they were solving some algorithmic tasks. Detailed results of this part of the experiment have been described in some other authors' publications listed in references. In this article, the most important results of eye tracking studies were synthesized in order to comprehensively describe the visual "behaviors" of the subjects, and thus show that the eye tracking technique can be useful in research on mechanisms for solving algorithmic problems.

Research methodology

Aims and scope of the study

The aim of the undertaken study was to diagnose the state of declarative and procedural knowledge of students associated with the forms of presentation and analysis of algorithms. The study involved the following:

- a) diagnosis of knowledge (declarative) of students on the graphic representation of algorithms in the form of so-called flowcharts based on the questionnaire,
- b) two-stage study of students' procedural knowledge, consisting in checking their ability to solve algorithmic tasks. In the first stage, students' eye movements were recorded while they were working on a computer monitor, the second consisted of students solving paper-based tasks.

Declarative knowledge is understood as self-esteem formulated by students, referring to the state of understanding the construction of algorithms and components of a flowchart. Procedural knowledge is revealed by behaviors – in this case it involves the ability to solve algorithmic tasks.

The use of eye tracking technique in one of the study stages was aimed at obtaining measurement data which relate to the visual activity of the subjects, based on which an in-depth analysis of students' behavior during problem solving was performed (diagnosis of procedural knowledge).

Procedure

Each study was conducted individually and the procedure involved three stages. In the first stage, students had discussions with the members of the research team, during which they were informed

about the course of the experiment. The aim of these conversations was also to reduce the level of stress, trigger positive attitudes among the respondents and motivate them to engage in the process of solving tasks. After the initial conversation, the students filled out a questionnaire in which they assessed the state of their knowledge about the algorithms presented in a form of flowcharts and indicated the source of this information.

The second stage of the study was recorded by an eye tracker and included solving tasks presented on a computer monitor. This part of the experiment began with activities that were to ensure the correct performance of the measurements (including setting position of a responder), providing the introductory instructions and the calibration of the device. Throughout the study, all the responders were provided with the same environmental conditions, such as lighting, temperature and sound insulation. During the second stage of the study, the tasks were presented in the form of slides (in the field of sciences and natural sciences: mathematics, physics, biology and computer science), which the students were to solve without the use of writing instruments. Each task required the analysis of the content of the instruction and the corresponding illustration. The time allocated for solving tasks was not limited, each pupil worked at their own pace and the order of tasks was the same. The respondents indicated the answers with the click of a mouse and verbally provided the ones, which according to them were correct. All the tasks required computational thinking from the students, however, for the purposes of this article only those that are classic algorithmic tasks are considered.

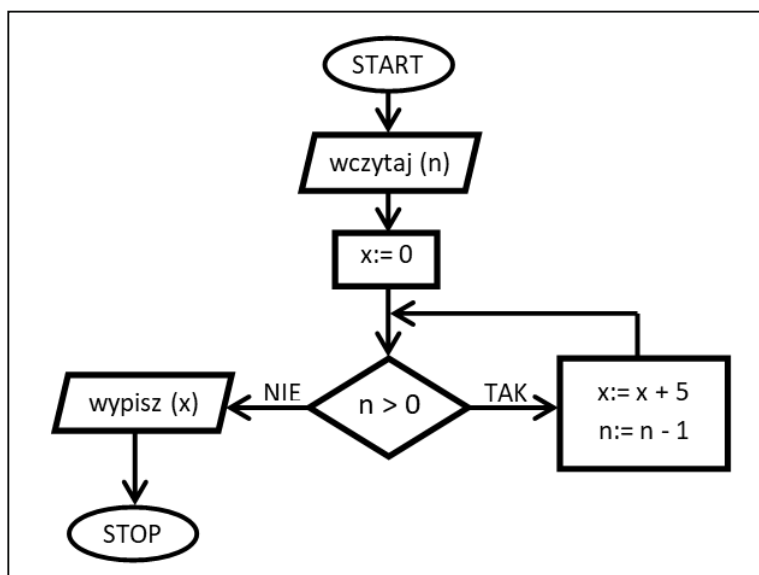
During the third stage of the study, which took place after the registration of eye tracking parameters, the students completed the questionnaire again and solved algorithmic tasks in a traditional form (in writing). Such order of research was connected with the need to minimize the impact of factors that could increase the cognitive load affecting the eye tracking indicators.

Material

The ALG_A task presented in figure 1 was solved by the students during the third stage of the experiment in a traditional way, using pen and paper. When determining the result, they could choose one of three ways to present it – a list of steps, a pseudocode or a flowchart. The task consisted in calculating the final value of the variable based on the analysis of the course of a loop in which this variable was modified.

The ALG_O1 (see figure 2) and ALG_O2 (see figure 3) tasks were displayed to the students on the monitor and during that time the visual activity of the study participants was recorded (the second stage). From the content of the task instruction, ALG_O1, students could read that through the analysis of the algorithm presented in the flowchart, they should indicate which set of input data will cause the algorithm not to end on the *Stop* block. The ALG_O2 task required the correct representation of the linear equation solution $ax + b = 0$ by the means of a flowchart. The instruction contained an analysis of the problem, so the task was to verify the correctness of the conditions stored in the appropriate blocks (conditional boxes). The ALG_O1 and ALG_O2 tasks were solved by students in black and white or color version (with so-called graphic clues).

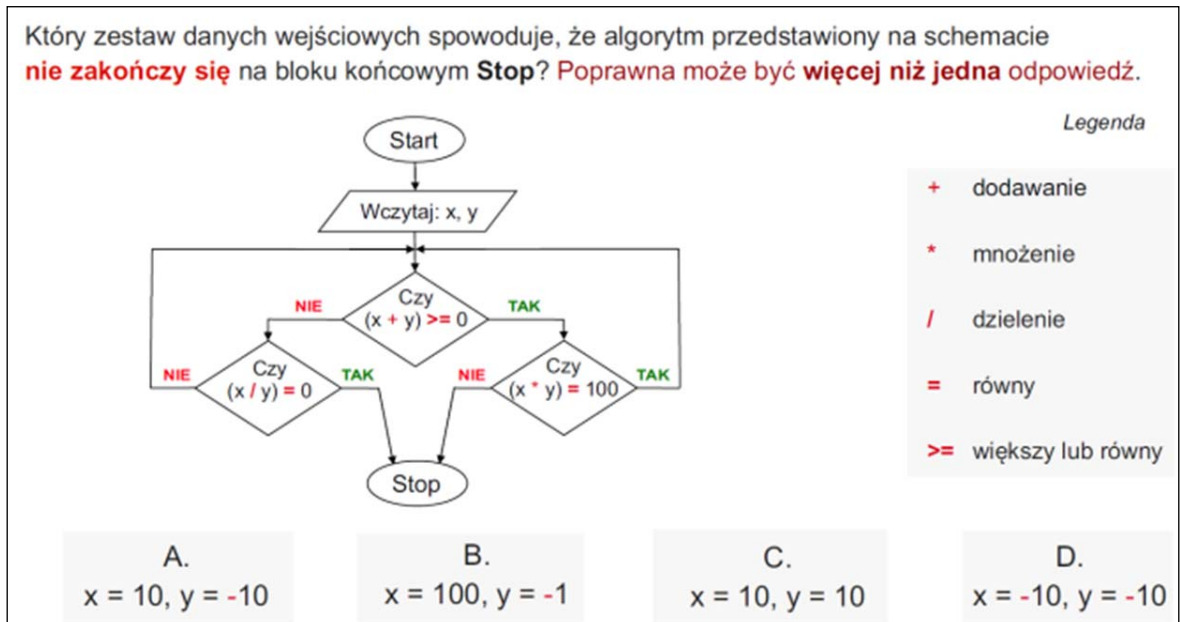
Figure 1. The ALG_A task – flowchart version*



* In figures 1, 2 and 3 the tasks are described in Polish because this is exactly how they were presented to the students. Source: authors' findings.

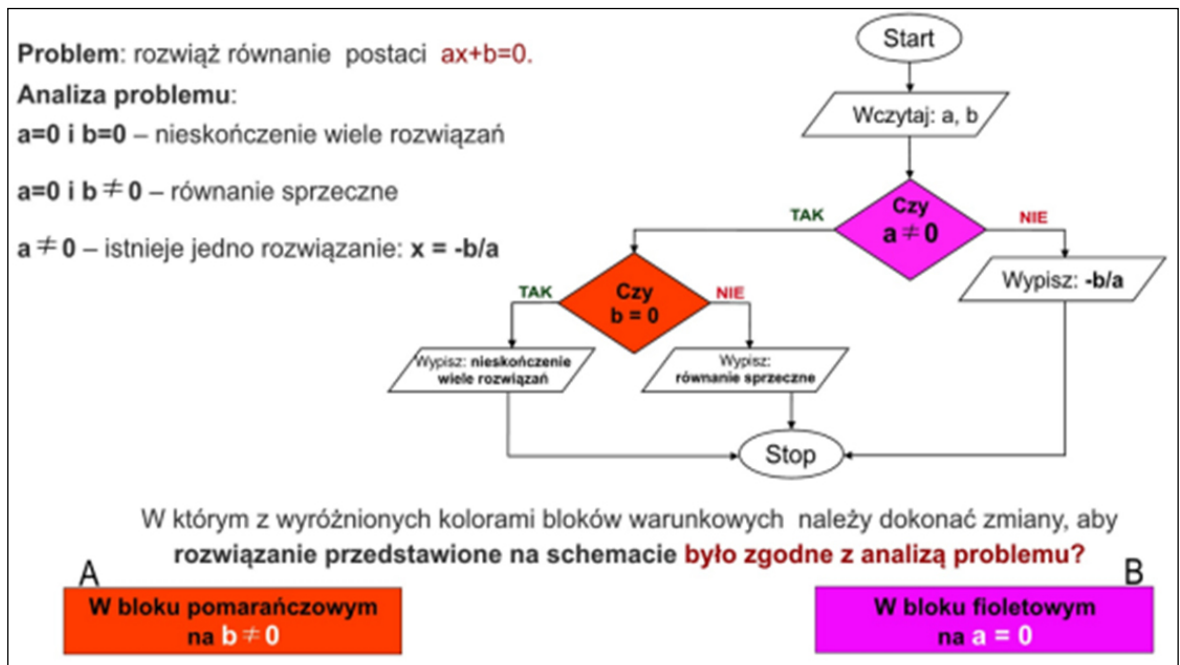
The eye-tracking technique in the analysis of mechanisms...

Figure 2. The ALG_01 task – version with graphic clues



Source: authors' findings.

Figure 3. The ALG_02 task – version with graphic clues



Source: authors' findings.

Apparatus

In the study the SensoMotoric Instruments iViewX™ Hi-Speed500/1250 eye tracker to record data at 500 Hz was used. This eye tracking system allows to keep the head still, without limiting the respondent's field of vision. The tasks were presented on an LCD monitor with a screen size of 23" and full HD resolution

of 1920x1080 pixels. The experiment was conducted using the SMI Experiment Suite™ 360 software package – the research scheme was designed in the SMI Experiment Center™ 3.4 application. The data registration was performed with the use of the SMI iView X™ module, and the results were developed using the SMI BeGaze™ 2.4 program.

Participants

52 third-grade secondary school students (aged 16) participated in all stages of the study, including 27 boys and 25 girls. For technical reasons, the eye data of 4 students was rejected and eventually 48 students were qualified for further analysis. The characteristics of the research group is complemented by the students' answers to the questions included in the questionnaire. The opinions analyzed below were expressed on the basis of an 11-point scale (from 0 to 10, where 0 meant very low and 10 very high). The students assessed their interest in IT as a school subject at an average level (the calculated descriptive statistics are: average $M=5.83$, standard deviation $SD=2.93$), with over 10% of respondents considering this level as low, over 50% as medium and almost 38% as high. The participants of the study were also asked whether they plan to choose a profession which will require the knowledge in the field of computer science. About 27% of respondents rated the probability of choosing such a profession as low, over 35% as medium, and almost 38% as high ($M=5.42$, $SD=3.44$). In the opinion of 4% of the respondents, IT is useful for the society at a low level, over 29% considers its usefulness as average, and 67% assesses it as high ($M=7.73$, $SD=2.38$). The results show that the students who took part in the experiment not only recognize the importance that information technology has for the development of societies, but also relatively many of them consider the possibility of acquiring professional qualifications related to this field.

Results

Declarative understanding of the presentation forms of algorithmic tasks and the effectiveness of their solutions

In the first stage of the questionnaire the students read the information about the graphical presentation of the algorithm, the so-called flowcharts. This information contained a description of the purpose (function) of individual types of blocks and an example of their use. After reading the discussed description the students declared whether they are familiar with

such way of representing the algorithms. For over 36% of students the principles of constructing flowcharts were completely understandable and over 63% of students declared that they understood them only partially and needed further explanations, including an example of such algorithm.

Indicating the source of their knowledge in this area, nearly 74% of respondents answered that they had become familiar with flowcharts in computer science lessons. However, a very large percentage of students (almost a quarter of them – 24%) admitted that they have not heard of this way of presenting a solution to the task, which is a worrying sign of the lack of such content implementation by teachers, as flowcharts are and have been part of the fundamental curriculum for computer science subject in secondary high schools. Detailed data is included in table 1.

The second and third stages of the study allowed to determine the procedural knowledge of students. The algorithmic ALG_A task in the questionnaire (the third stage of the study) has been presented in three corresponding forms: a list of steps, a flowchart and a pseudocode. At first, the students declared which of the recording methods is the most understandable for them (table 2), and then made a selection of one of these forms to determine the result of the algorithm for a given input value. The largest number of respondents (60%) considered the presentation of the algorithm in the form of the verbal list of steps as the most comprehensible, the flowchart or the pseudocode were indicated by about 15% of respondents, and for 10% of them all the methods were equally understandable. However, the distribution of responses related to the choice of a specific form of the algorithm presentation in order to solve the problem was different – almost 43% of the respondents made calculations based on the list of steps, 33% chose the flowchart and 24% chose the pseudocode.

In total, the percentage of correct answers was 27% (table 3), the other students either answered incorrectly (25%) or did not provide the answer (48%). The most correct answers (nearly 38%) were given by students who solved a task presented in the form of a list of steps. The level of difficulty of the task can be considered as corresponding to the standard adopted

Table 1. Source of knowledge about flowcharts

Information about flowcharts is for me:	Number	% of answers	% of cases
known from IT lessons	34	53.97	73.91
known from math's lessons	6	9.52	13.04
known, because I'm interested in programming and have read about it on the Internet	9	14.29	19.57
known, because I'm interested in programming and have read about it in magazines and books	3	4.76	6.52
unknown – I have not heard about this method of presenting the solution to the task	11	17.46	23.91
Total	63	100.00	136.96

Source: authors' findings.

The eye-tracking technique in the analysis of mechanisms...

Table 2. The students' preferred form of the algorithm presentation

The most understandable form of presentation of the algorithm:	Number	% of answers
a list of steps	29	60.42
a flowchart	7	14.58
a pseudocode	7	14.58
all methods of presentation are equally understandable	5	10.42
none of the methods is understandable to me	0	0.00

Source: authors' findings.

Table 3. Effectiveness of the ALG_A task solution

Task solution:	Total		List of steps		Flowchart		Pseudocode	
	Number	% ans.	Number	% ans.	Number	% ans.	Number	% ans.
correct	13	27.08	7	38.89	2	14.29	3	30.00
incorrect	12	25.00	6	33.33	5	35.71	1	10.00
no answer	23	47.92	5	27.78	7	50.00	6	60.00

Source: authors' findings.

by the Central Examination Board (the comparison was made with the algorithmic task included in the extramural examination for persons who graduate in computer science at junior secondary school level). The obtained results (low effectiveness of solving the task) provide the basis for the formulation of an observation that the change in presenting students with IT knowledge is essential – the more so that according to the new core curriculum of computer science and its learning outcomes, such a task should be classified as very easy, even elementary.

As in the case of the ALG_A task, the solution of algorithmic tasks during testing with the use of the eye tracker (the second stage of research) was difficult for the students. The indicator of the correct answers for these tasks was calculated after taking into account the factor, which was the confirmation of the fact that the answer provided by them was accidental (they did not understand the task) – in the case of the ALG_O1 task 27% admitted that, whereas with the ALG_O2 task the number was 44% of students. The percentage of correct answers was 25% for the ALG_O1 task, and almost 38% for the ALG_O2 task.

In the questionnaire, the students also assessed the level of difficulty of the tasks being solved (based on the 11-point scale – from 0 to 10, where 0 – very easy, 10 – very difficult). Analyzed algorithmic tasks were classified by students as moderately difficult – ALG_O1 $M=5.38$, $SD=2.69$ and difficult – ALG_O2 $M=6.35$, $SD=2.89$. A detailed breakdown of the assessment of the difficulty level of tasks performed by students is presented in table 4. It is worth noting that among all the tasks solved by students during this study, both algorithmic tasks obtained the highest average values, i.e. they were considered the most difficult (Andrzejewska and Stolińska, 2016, p. 6).

Synthesis of eye tracking results

The data obtained as a result of registration of students' visual activity during solving the ALG_O1 and ALG_O2 tasks (the second stage of the study) allowed for a further, in-depth analysis of the respondents' behavior during this process.

In the last few years, eye tracking studies have been increasingly recognized as a valuable research technique. On the one hand, they provide quantita-

Table 4. Assessment of the level of difficulty of tasks ALG_O1 and ALG_O2

The level of task difficulty	ALG_O1		ALG_O2	
	Number	%	Number	%
very easy	4	8.33	2	4.17
easy	12	25.00	8	16.67
moderately difficult	10	20.83	10	20.83
difficult	17	35.42	15	31.25
very difficult	5	10.42	13	27.08

Source: authors' findings.

tive data related to the measurement of oculomotor parameters (such as, for example, saccades and fixations), for which statistical inference can be made; on the other hand, they allow for the qualitative assessment of results based on respondents' pathways of sight (*scan paths*) and animated films of the points in which the respondent's eyesight (*bee swarm*) is located. In addition, the separation of the so-called *areas of interest (AOI)*, together with their key indicators, allows a detailed analysis of the visual activity of the responders. These indicators are, for example: the time that the respondents spent on observing a given area (*dwelt time*) expressed as a percentage of the duration of the whole experiment, the number of fixations (*fixation count*), their average duration (*the average fixation duration*), or the number of (re-)fixations (*revisits*), as well as the time that elapses until the first fixation in a given area (*time to first fixation*) and the associated parameter indicating in which order the particular areas of interest were observed (*sequence*).

The analysis of film materials, which was supplemented by statistical calculations of numerical data, related to the visual activity in the AOIs marked on the boards enabled, in the case of the ALG_O2 task, to recognize and interpret the differences in the way the problem was solved by two selected students who obtained the correct answers (Stolińska and Andrzejewska, 2017b). The study showed different allocations of attention resources, whereas their tracking enabled the identification of a strategy that can be described as optimal, characterized by a focus of attention on the key content of the algorithm, and the control detailed analysis of the problem and multiple verification of compliance of the adopted solutions with the content of the task.

Similarly, in the case of the ALG_O1 task, based on the analysis of the scan paths, it was possible to identify the behavior of students who provided the correct answer and their classification into three groups (Andrzejewska and Stolińska, 2017). The students were divided to those who solved the task in accordance with the control resulting from conditional blocks and those who correctly indicated the answer, but mistakenly analyzed the algorithm. The third group were the respondents with "atypical" visual activity. It was also noticed that students much more frequently than needed, in the situation of solving tasks with the possibility of making calculations on a piece of paper, controlled the input data to the algorithm. In addition, the eye tracking data allowed for the detection of students who, despite providing the correct answer, made mistakes at the stage of performing mathematical operations and those who did not read the text instructions to the task.

For both tasks, the oculomotor data were subject to quantitative analysis in order to examine the differences in the basic values of the eye parameters for the two versions of the task (with or without additional graphic instructions). The aim of this analysis was to verify the views on the didactic role of such guidance also in the context of cognitive load theory

(Stolińska and Andrzejewska, 2017a), which takes place in the process of learning programming. The issues related to cognitive load occurring during solving of algorithmic tasks – both internal (depending on individual properties – people's intellectual potential, their experience and other factors), as well as external ones are one of the interesting trends in the area of discussed scope of subjects. Difficulty in solving algorithmic tasks may increase the form of the presented algorithm, redundancy of information, the necessity of structuring information or making decisions with regard to the selection of content provided as a hint in the task (Garner, 2002; Stolińska and Andrzejewska, 2017a).

In the case of the ALG_O2 task, there were no significant differences in the values of the eye movement activity associated with the fixations for the two versions of this task. The result could have been influenced by the form of the hints used, which in this task were discreet in nature and neither encumber the cognitive resources of the respondents nor disturb the process of processing visual information. This result confirms the view of some researchers (Ozcelik et al., 2009) that the changes in the field of view, such as coloring or bolding the text, belong to a group of hints that cause an automatic orientation reflex in their direction. Thus, one can interpret the lack of differences in the average fixation duration and fixation count in the flowchart area in the case of the ALG_O1 task (Stolińska and Andrzejewska, 2017a) – coloring of fragments of texts in this case was not a sufficiently significant factor affecting the cognitive processes of the respondents. The positive effect of directing students' visual attention on key elements of the board, as in the case of the ALG_O2 task accompanied by the hints, also confirmed a slight shortening of its execution time and a higher percentage of the correct answers.

The analysis of the eye tracking data in the ALG_O1 task did not show that the graphic distractors attached to the task were elements significantly increasing the external cognitive load, which leads to the assumption that the students' subjective opinion about the level of difficulty of algorithmic tasks (which were considered to be the most difficult of all the tasks solved by the students) is strongly related with an internal cognitive load, which depends directly on the effort that one allocates to understand a problem (its structure and complexity).

Summary

The low efficiency of solving relatively simple algorithmic tasks and at the same time not high level of knowledge declared by the students confirm the assumption, adopted in the new core curriculum, that the center of gravity in IT education should be focused on developing the ability to analyze and solve problems based on logical and abstract thinking. Therefore, it is necessary to further improve the knowledge about the difficulties associated with teaching algorithms

and finding ways to minimize them. The use of eye tracking technique for this purpose is a promising direction for researchers' activities, and the synthesis of eye tracking results presented in the article, which provided objective information on students' behavior during solving algorithmic tasks, seems to confirm it.

The possibility of interpreting visual information processing patterns opens some new theoretical and cognitive perspectives in the field of didactics, including the methods of teaching algorithmics and programming – the areas of computer science which in essence aim to solve problems, that is, require information processing at a “higher level” and engagement of different cognitive mechanisms (attention, memory, perception). New research methods, such as eye tracking, can objectively help to explain the processes which take place during learning and to verify the teaching theory.

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Abstract

The ability to solve problems using algorithms plays an increasingly important role in modern society, whereas programming, alongside with broadly understood digital skills, are considered to be one of the key competences of the future. The result of this trend is the modification in the Polish education system of the IT subjects' core curriculum, under which teaching programming is planned at every stage of education.

While teaching the skills of programming is important, it is not an easy task to achieve and hence it poses many methodological challenges. Researchers in this field are increasingly turning to new experimental methods, such as eye tracking techniques that allow to gain an insight into cognitive mechanisms and thus can provide objective information about the process of learning programming.

The article discusses the results of authors' own study, in which the state of declarative and procedural knowledge of students related to the forms of algorithm presentation was diagnosed. The questionnaires along with the tasks included in them, which the students solved in a traditional way and with the means of eye tracking techniques, were used in the study to track the process of solving comparable tasks presented on a computer monitor. The indicator of operational knowledge was the effectiveness of problem solving. The research was conducted on a group of 48 third-grade junior secondary school students.

The obtained results (low level of correct answers) indicate that the situation in the area of learning the algorithmic skills of students requires improvement. The measurement data obtained using eye tracking allowed for an in-depth analysis and interpretation of visual activity of students. Therefore, it seems that eye tracking can be considered as a complementary research technique, enriching the state of knowledge on cognitive mechanisms that are triggered in the process of solving algorithmic problems.

Keywords: algorithmic problems solving, flowchart of algorithms, teaching and learning programming, eye movement parameters, eye tracking

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An intuitive app generator and accompanying e-learning modules as examples of successful assistive technology

Magdalena Brzezińska*

Introduction

This paper will begin with two seemingly subversive questions.

In the world where many people without disabilities are not comfortable using new technologies, is there a point of introducing such technologies to people with impairments?

Can a very simple training app and accompanying e-learning material for the trainer be as effective in aiding people with disabilities as advanced assistive technology like screen readers or eye-gaze trackers?

The author of this paper, who was a member of a two-year-long European Union Erasmus+ project named Count Me In Too (CMI2), aimed at people with disabilities (whose main products were a super simple online generator of training apps and a bank of the latter), will try to prove, by providing evidence from general scientific research and studies conducted by partner institutions, that it is in fact justified and effective to equip trainees who have learning difficulties with new technologies, and, in certain specific cases, a very simple training application created in an intuitive and easy-to-use generator can be as beneficial and empowering as advanced AT.

The partners of Count Me In Too project – Teatr Grodzki from Bielsko-Biala, Poland, Eldeberry AB from Sweden, eLearning Studios in Coventry, Great Britain, GAIA Museum – Outsider Art from Randers, Denmark, BEST from Vienna, Austria, and Symbiosis from Miskolc, Hungary – wanted to empower people who are disadvantaged because of disabilities or broadly understood learning difficulties¹.

Importance of e-learning resources

As stressed by Bonk (2016, pp. 6–20), present-day educational leaders should not provide the type of education they themselves used to receive, as nowa-

days it would not be effective. *That would not even get someone a job washing dishes. The real world is far too technologically sophisticated*, states Bonk straightforwardly. This seems to hold true for both learners with and without learning difficulties or deficits.

According to Bonk, who expresses the view of numerous scholars, rather than relying on old-style forms of education, we should take advantage of what the modern world has to offer: technology-enhanced instruction that is less formal and on demand, *sought when and where needed* (see also Song and Bonk, 2016).

Bonk (2016, pp. 8–15) identifies 30 momentous educational changes brought about mainly by the introduction and gradual dissemination of e-learning, and groups them into 3 large categories: learner engagement, pervasive access, and customization. In this paper, special emphasis will be put on learning being more mobile, visual, immersive, digital, adventurous, and (particularly) hands-on (all of these belonging within the learner engagement category); more video-based, immediate, synchronous, and free (the pervasive access category); and finally, more self-directed, competency-based, on demand, modifiable, and personal (the customization category).

Educational and professional situation of people with disabilities in Europe

According to statistics presented in the European Comparative Data on Europe 2020 and People with Disabilities report from December 2013 (Grammenos, 2013, p. 4), in 2011, about 26% persons aged 16+ declared disabilities, 8% of which were severe, and about 18% were moderate. Nearly 47% of persons with disabilities were employed, compared to 72% of persons without disabilities, while the Europe 2020 objective is the employment of 75% of the total adult population. Interestingly, the employment rate of people with a moderate disability (44% for women and

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¹ To a significant extent, the terms “disabilities” and “learning difficulties” will be used interchangeably in the paper, with the preference of the non-stigmatizing and non-labeling “learning difficulties”.

51% for men) was strongly related to the employment rate of non-disabled persons, whereas there was no such correlation between the rates of employment of persons with severe disabilities (28%) and persons without disabilities.

The rate of (un)employment of persons (including ones with disabilities) is correlated with the level – or lack – of education. Eurostat statistics from the year 2017 (Employment Statistics, 2017) state that the employment rate of adults 25+ with primary or lower secondary education was 54.3%. They were also most affected by the crisis: their employment rate fell 5.1 percentage points between 2007 and 2013, whereas the corresponding number for those with a medium level education was 1.7 pp., and for those with high education 1.8 pp..

It is disturbing then to discover from Grammenos's report that 19% of disabled youth in the EU are early school leavers (as opposed to 11% of their non-disabled colleagues). There has been a continuous decrease in this respect (19% in the year 2011 versus 22% in the year 2010); however, what is troubling is that about 21% of disabled adults – compared to 15% of non-disabled ones – are at risk of financial poverty, and 12% (compared to 7%) are living in households which are "severely materially deprived". Also, 37% (compared to 22%) are at risk of social exclusion.

If the percentages do not seem alarming enough, numbers certainly do. According to the Literacy in Europe factsheet of the European Literacy Policy Network project (Literacy in Europe: Facts and Figures, 2015, p. 2), in the year 2013, just the number of adults (16+) with literacy difficulties in Europe equaled 55 million. The editors of the factsheet point to the fact that literacy is "an essential prerequisite for all kinds of learning", and persons with literacy difficulties (as many as 27.9% in Italy, 27.7% in Spain, or 21.7% in France, with a European average of 16.4%) are threatened with unemployment, lower wages, inequality, social exclusion, the feeling of helplessness, health problems, depression, involvement in crime, or a higher death risk. Coincidentally, Grammenos also notes that *the number of young persons with disabilities (...) who have never been in education is relatively high in Spain, Italy and Lithuania* (Grammenos, 2013, p. 89). This may lead to the assumption that the two groups (persons with literacy difficulties and learning deficits and persons with disabilities) overlap, possibly to a significant extent. All these issues not only immediately affect persons with learning or literacy difficulties, but they also have a huge influence on national economies. The editors of the factsheet claim: *Literacy difficulties cost the global economy 1.1 trillion euros each year and the EU economy over 350 billion euros each year (...) due to lost earnings and limited employability, lost business productivity, lost wealth creation opportunities for individuals and businesses, lower technology skills capacity in future, higher spending related to health problems, higher spending on the justice system due to more crime, higher spending on social services and benefits, higher spending on education*

due to students falling behind (Literacy in Europe: Facts and figures, 2015, p. 6).

Thus, there is an economic rationale and justification behind the need to provide persons who have learning difficulties with effective learning tools, and to foster the inclusion of people with disabilities in the education system and job market.

However, there is more. A vital argument that needs to be taken into consideration is what makes our developed European civilization distinct from previous ones and our approach different from those of underdeveloped countries, namely our sensitivity to disabilities, respect for people regardless of their impairments and limitations, and focus on improving the quality of life for everyone, by reducing environmental, social, and attitudinal barriers.

Grammenos's report legitimately emphasizes the European Disability Strategy 2010–2020: *Persons with disabilities have the right to participate fully and equally in society and economy. Denial of equal opportunities is a breach of human rights* (Grammenos, 2013, p. 12).

Therefore, every effort should be made to foster complete and equal participation of persons with learning difficulties in social and economic life, not only for materialistic reasons, but also – more importantly – because of humanitarian ones.

E-learning for persons with disabilities

So far, the importance of online learning resources in 21st century learning and instruction has been established, and the educational and professional situation of people with learning difficulties in Europe (which further influences the economies of whole countries and the overall EU economy, as well as the shape of our societies) has been discussed.

In order to remedy this unfavorable state of affairs, it seems justified to make flexible, on-demand, and personalized e-learning systems accessible to the disabled, bearing in mind that the term "disability" or "learning difficulty" is very broad and can encompass a wide variety of problems and challenges.

In their report, McKnight and Davies (2012, pp. 27–43) distinguish between the following groups of students with learning difficulties:

- individuals with autism and autistic spectrum disorders,
- individuals with dyslexia and literacy difficulties,
- individuals with dyscalculia and numeracy difficulties,
- individuals with ADHD,
- individuals with visual impairments,
- individuals with hearing impairments and deaf learners,
- individuals with mobility impairments,
- individuals with dyspraxia.

As can be anticipated, each of these distinct groups requires a personalized approach, but certain general rules can also be applied to make e-learning content disabled-user-friendly. According to Retova and Polya

An intuitive app generator and accompanying e-learning...

(2012, p. 126), these would include, for example, an easy-to-read, comprehensive (“uncluttered”), and consistent display of information, clear references and directions, or providing programs or software supporting assistive technologies already used by persons with learning difficulties. Some features added by Crossland et al. (2016) include adjustment of text colors and backgrounds, changeable color contrast, alterable text size, or captions for videos. The CMI2 partners took all of the above into consideration while creating context-aware assistance tools, including a super-simple generator of training apps, the apps themselves, and e-learning material accompanying the apps, which were further translated into all of the partner languages, including two of the most frequently used European ones, English (38%) and German (11%). In fact, they tried to accomplish what is advertised by Krakower and LePage Plante (2016) or Crossland et al. (2016): they attempted to create a tool that combines assistive technology with differentiated instruction, being aware that customization and personalization allow for significant flexibility and create a framework for student engagement and accomplishment. What the CMI2 partners also strived to achieve by using technology to empower people with disabilities is help persons with impairments and learning difficulties integrate into society and experience independence and equality (Wong, 2016, quoting Stephanie Utzman of Adler’s Voice NGO).

Mobile devices in VET training

Mobile devices are more and more frequently used in all aspects of life. Today’s smartphones have nearly all the functionalities of stationary devices, and a huge advantage over laptops and desktops: they are portable, handy and convenient (compare McKnight and Davies, op. cit.). In addition to being constantly available, they do not require special space, such as a computer room, which allows learners to use them at their convenience.

Young and MacCormack (2014) indicate that, in completing a task, AT can help learners with disabilities in two distinct ways: by assisting them in accomplishing the task and by helping them to bypass an area of difficulty. This can be more readily done if trainees use convenient and accessible mobile devices.

Kukulka-Hulme (2010, p. 3) adds that mobile devices are particularly beneficial when learning a practical task: they can often be used while performing an activity or practicing a skill. She also discusses additional benefits for learners, some of which are:

- using reasonably-priced technologies
- acquiring skills and knowledge at one’s own pace
- a significant degree of desired privacy, or
- applicability to authentic educational needs

Additionally, her Mobile Learning Policy Brief stresses the fact that e-learning and mobile learning strongly foster lifelong learning. *Over time, students*

become more able to take responsibility and the habits of lifelong learning can take root. This is facilitated by mobile access to social networks that can support a person’s learning goals and career development over a lifetime (Kukulka-Hulme, 2010).

A huge advantage of this type of education is also that it is non-judgmental (compare to Stetter and Hughes, 2010, pp. 1–16), which may not be the case for human-delivered training, especially in the classroom setting. This, in turn, may be crucial for students with learning-related anxiety, learned helplessness, and a history of academic failure, and it can reduce their dependence on the teacher/instructor (see Young and MacCormack, 2014).

Origination of the Count Me In Too (CMI2) Erasmus+ project

In the year 2015, partners from Elderberry AB, Hägersten, Sweden, Teatr Grodzki, Bielsko-Biala, Poland, eLearning Studios, Coventry, Great Britain, GAIA Museum of Outsider Art, Randers, Denmark, BEST Institut für berufsbezogene Weiterbildung und Personaltraining GmbH, Vienna, Austria, and Symbiosis Foundation, Miskolc, Hungary launched an Erasmus+ EU project for people with disabilities/learning difficulties within the lifelong learning framework. The project was built on a previous initiative of several European partners (GAIA Museum Outsider Art, Foreningsfællesskabet LigeVærd from Denmark, Elderberry AB, eLearning Studios, The Herbert Museum from Great Britain, Autism Europe from Belgium, and Debajo del Sombrero from Spain) called Count Me In and focused on Vocational Education and Training (VET) for special needs groups through the arts and cultural sector.

The partners of the new initiative decided that the two with the most significant expertise and know-how in the domain of e-learning and relevant technologies, i.e., eLearning Studios and Elderberry AB, should focus on developing a simple, intuitive tool for the creation of text-based apps and on elaborating e-learning modules to be incorporated into existing VET courses. The remaining partners concentrated on the creation of diverse, personalized applications for mobile devices to facilitate the learning processes of trainees with learning difficulties, to give them more independence and self-confidence (compare Hayes, 2013).

Simple training apps

The theoretical foundation for the creation of all partner applications was built by two partners: eLearning Studios, who brought in their IT expertise and who *aim to design eLearning solutions that excite, delight and work for the modern learner* (eLearning Studios), and Elderberry AB, who had had a long tradition of offering teacher training courses and publishing educational materials and handbooks. Both partners stressed the importance of having a particular user and his/her specific needs in view.

Thus, the first stage of app creation was a very accurate and specific determination of the beneficiary and his/her deficiencies and requirements. Upon clearly defining the user and his/her needs, a storyboard of the application was created. This was necessary to make the product effective, tailor-made, and practical. It also allowed app designers to revise the whole process, sometimes so well-known and intuitive that it obscured the possible difficulties a disadvantaged user might have.

It was at this stage that the makers needed to specify the form of application contents. They had to decide whether their users needed a collection of short videos with a soundtrack/voiceover, and if so, what the props, background, commentary, and length of the videos should be.

Another app option was a collection of photos or other illustrations with accompanying text. In this case, it was vital to determine how to make the photos clearly depict the process, and how to format the text.

At the beginning of the project, the developers of the app generator conducted a very detailed survey, which proved that organizations and educational institutions aimed at persons with learning difficulties usually found the following 5 fonts the most effective:

- Arial,
- Times New Roman,
- Verdana,
- Calibri,
- Georgia.

That is why these fonts were employed in the Count Me In 2 generator and each individual app designer was to decide which one would be suitable for his/her target users. It was also possible to select font size and color, color palette, and button and background color, to make a numbered or bulleted list, or to use up to 4 checkboxes to force the trainee to consciously go through the training process and its stages.²

Another option a designer could make use of was sound. Instead of or in addition to uploading videos or pictures and inserting text, it was possible to upload a pre-recorded audio file to each screen, or even to record a file immediately within the generator to voice-describe the desired process, if necessary.

The generator was frequently tested, and certain problems were detected. One problem was the slow upload of relatively large video files, which sometimes resulted in a timeout when saving a content-rich application. Another problem was the initial impossibility of editing pictures uploaded to the generator. eLearning Studios' developers successfully solved the issues and remedied other undesirable limitations

of the tool. After an in-depth discussion with other CMI2 partners, they also decided that instead of the initially envisioned video that would explain how the app generator should be used, a built-in step-by-step tutorial would be created to help the users while they build an application. Another useful functionality added was one of assigning users to the developed app. It was thought to be particularly useful when the trainer wanted to make sure that the users for whom the app was created will get a direct link and be able to download the application to their device.

The mobile applications created by Teatr Grodzki

The first application created in the eLearning Studios-designed generator, and the first application created by the Polish Partner, Teatr Grodzki – “Making Paper Puppets” – was aimed at participants of puppetry and storytelling workshops offered by Teatr, in particular ones taught by Instructor Maria Schejbal.

Firstly, the puppet making process and its stages were carefully examined and studied. Then, a storyboard was created. Next, a short instructional video was filmed, with Maria showing the process of paper puppet creation step-by-step. It was decided that the app would be most effective if only the instructor's hands were filmed, and the necessary materials and subsequent stages of puppet creation were shown against a non-distracting, black background. The next stage was a professional recording of a voiceover in Polish and English. Finally, the voiceover and subtitles were added to the video (two separate language versions of the video were produced).³

The stage following the creation of the video was cutting it into manageable chunks to make it comprehensible and easy to follow for learners with learning difficulties. A mobile application was then gradually created online, in the eLearning-Studios-developed generator.

Once ready, the application was presented and advertised online (e.g., on Facebook, Twitter, LinkedIn, or on partner websites), and during EU-funded partner meetings related to other Teatr Grodzki projects, e.g., in Rethymno, Greece, or Palermo, Italy, as well as during workshops taught by Teatr Grodzki. It received very positive reviews, and users stressed its potential and usefulness, and the versatility of the generator, which, users stated, appealed to both visual and auditory learners, and to trainees with various types of learning problems.

At present, the app is used during drama and storytelling workshops taught by Teatr Grodzki instructors. It is considered an interesting and valuable teaching

² eLearning Studios consulted with the partners about the functionalities at each stage of creation and testing of the generator, and it was agreed that the text should be brief to be clear and understood, hence the limit on the number of checkboxes.

³ The video can be viewed on YouTube in English at <https://www.youtube.com/watch?v=gbFYQTQ0NpU>, and in Polish at <https://www.youtube.com/watch?v=iyF4TzKXYZO>.

An intuitive app generator and accompanying e-learning...

aid that the participants can also refer to outside the course.

The second application for mobile devices created by Teatr Grodzki, "How to Bind a Book",⁴ was especially designed for Teatr's Printing and Bookbinding House, which employs 40 adults with special needs and 16 members of staff. The House aims not only to generate profit, but most importantly to assist the employees in social rehabilitation and help them integrate into society.

New employees of the House begin their on-site training by familiarizing themselves with the bookbinding process, which is quite complex and frequently re-taught. It was therefore assumed that the application would be a useful, timesaving tool that would alleviate part of the training burden from the instructor. It was also assumed that the application could allow the learner to be more independent, as s/he could re-view and re-examine the process at his/her own pace.

The application to be created was to help the users make and bind a book in a skillful way, with only limited assistance. Since the process is not only about teaching craft and niche skills, but also about improving fine motor skills, increasing the employees' autonomy and fostering their self-confidence and self-esteem, the social aspect of creation was fundamental.

The basis for this particular app was an extensive interview conducted by the Polish Count Me In 2 partner with several employees of the House, who listed the tools and materials needed and explained the bookbinding process in significant detail. They also agreed to take an active part in the creation. A professional photographer was commissioned, and an on-site photo-shoot took place, with Printing and Bookbinding House employees as actors.

The major problem encountered was complexity of the process itself, which turned out to be much more difficult than initially predicted. Even though an interview with the manager of the House was conducted, and the responses to user questionnaires all proved that the application met everyone's expectations, and therefore it has been used in the House ever since its creation, the authors are considering breaking the process up and creating several shorter applications instead of one long one.

Encouraging feedback regarding the application was received in an interview with Ms. Beata Moskała, the Bookbinding and Printing House Product Manager. It was learned that the app significantly aided instructors at Bookbinding House. For example, when an employee of the House used the How to Bind a Book app, the instructor was able to provide more assistance to other trainees, which obviously made

the instructor's job more efficient. The independence aspect was enhanced by the fact that, with the help of the app, it was even possible for employees of the House to make and bind a book outside of the professional setting, as certain substitutes for tools and materials (listed in the app) made it feasible.

Count Me In 2 free educational resources

The partners of the project created 11 training apps in English, with accompanying e-learning material aimed at vocational education and training professionals, trainers, and employers of people with learning difficulties. Eight partner-created apps, selected by each organization according to the beneficiaries' particular needs, were translated into national languages; they constitute a bank of educational resources⁵ to be followed or adapted by interested users.

E-learning modules, supplementing the applications and providing explanations for how to use a given app and/or create a new one, which are already incorporated into the existing Elderberry AB courses for educators of persons with special needs, can be accessed at the Count Me In Too platform⁶ at <http://cmi2elearning.eu>.

Each module consists of the following parts:

- Introduction,
- Task Description,
- Process Description,
- Learning Objectives,
- Conclusion,
- Links,
- Documents and Videos.

In the Introduction, VET educators can find information on the entity that created the specific application, its target group, and the reason for creating a particular app. In the next module, the task taught through the app is explained. Then, the whole process is described. It is followed by ECVET⁷-inspired learning outcomes (including knowledge acquired, skills acquired, and competences acquired), and a conclusion. The links, documents, and videos uploaded to the Open Educational Resource platform constitute an addendum to and an extension of the e-learning module content.

CMI2 Partners believe that the app generator, the created applications, and the e-learning modules they built will serve as inspiration for teachers, trainers, managers, and supervisors worldwide, facilitating VET training and other types of e-learning, both for learners with disabilities and those without.

The tools have been widely and successfully tested with over 300 non-disabled and disabled learners during workshops in Denmark, Hungary, and Poland. To assess the project, the partners conducted an impact

⁴ Retrieved from https://www.cmi2.eu/en-gb/app_generator/app/129/.

⁵ Retrieved from <https://www.cmi2.eu/en-gb/apps/>.

⁶ Retrieved from <http://cmi2elearning.eu>.

⁷ European Credit system for Vocational Education and Training.

study focused on effectiveness, impact, relevance, and progress factors. Three types of questionnaires designed by project partners were used to collect feedback from three groups: the project partners themselves, VET educators, and users with disabilities. The partners were to provide feedback, not only on their own experience, but also on the local and national impact of the project.

In all, 6 partner questionnaires, 33 VET professional questionnaires, and 26 questionnaires completed by users with learning difficulties were collected. The findings were as follows: the project was evaluated as having a very high impact in terms of using CMI2 results in the partners' own organizations; new knowledge was gained; and the reputation and image of partner organizations were enhanced.

The survey results showed that final users included organizations within the social sector, disability sector, education sector, art sector, and public and private service sectors, which proved that the CMI2 project results were applicable to a much wider variety of contexts than the partners initially assumed.

The results of final analysis, as compared to the mid-term one, showed that the impact of the project was greater in all the listed areas:

- impact on policy and regulatory environments at the European level,
- impact on policy and regulatory environments at national levels,
- enhanced social inclusion,
- enhanced cohesion,
- enhanced social welfare,
- enhanced level of scientific and technological knowledge.

As regards the opinions of vocational education professionals, 33 feedback forms were collected: 9 from Elderberry AB, 8 from Teatr Grodzki, 6 from GAIA, 5 from BEST, and 5 from Symbiosis. The profiles of respondents varied, which provided the opportunity for a relatively objective assessment of potential impact of the project on various groups of professionals. Thirty respondents represented the education and training sector. Ten represented social services, and 7 represented the arts and culture sector. Eight organizations were governmental, 8 were focused on business, 12 were non-profit, and 4 were independent. Their beneficiaries varied too. They ranged from children and young people to elderly people. They also included people with disabilities, persons of particular ethnic or racial origins, etc.

Eleven respondents viewed the usability of CMI2 educational resources as very high and eighteen of them viewed the usability as high. When asked to what degree CMI2 resources supply people with disabilities with skills needed in the labor market, 10 respondents said that the level was very high, and 18 said it was high. Twenty-three respondents saw the difference made in their services by CMI2 educational resources as varying from rather high to tremendous, especially with respect to motivating and engaging students, being efficient, easy to use, tailored to the needs of

a particular user, and practical. It was stressed that workers became more independent while performing tasks. Educators pointed to the fact that CMI2 products could be easily incorporated into their existing training programs. Among the few weaknesses listed, the most underlined one was the need for users' relative proficiency in using a smartphone or a tablet.

Essential feedback came from users with disabilities, who were the most important target group of the project. It was vital for the partnership to determine the direction of possible further development of the project, and it provided vocational education professionals with immediate suggestions for changes and improvement of the materials they created. Of the 26 questionnaires collected, 11 were submitted by Teatr Grodzki. An overall analysis showed that 81% of the respondents used a CMI2 app every day – and of those who did, 80% did not need any help with it. This proved that the tools developed by the partnership were appropriate for the target group. Fifteen respondents viewed the apps as very useful, and 11 viewed them as useful. Ten of them liked learning with CMI2 apps very much, and 16 liked them quite a lot. Thirteen users thought that the app was very successful in saving their time; 12 saw it as successful, and only one person thought it was not helpful in this respect.

Some additional comments of the users are provided below:

- “a very practical instrument”,
- “The app is useful. It depends on who is using it. When you learn how to make a paper bag for the first time, usually another person works better than the app. But when you want to remind yourself how to make such a bag, of course the app is very useful”,
- “An app is ideal for people who have problems with focusing on a task, and also for those who have problems with acquiring knowledge”,
- “A great app generator. Easy to use, useful in professional life, for learning, and for fun.”

Conclusions

The author of this paper – a member of the Count Me In Too project, which created a simple and intuitive online generator of training apps and a diverse collection of apps for people with disabilities and learning difficulties – has attempted to demonstrate that it is reasonable and effective to provide learners who have disabilities and learning difficulties with adequate new technologies to facilitate their learning process. By providing evidence from general and partner research, she also endeavored to prove that, in specific instances, a tailor-made training application created in an uncomplicated and easy-to-use, yet refined and deliberately designed, app generator can be as valuable and advantageous as sophisticated AT. What makes it so valuable is the practical and carefully developed generator itself, as much as the sophisticated, yet simple and concise, e-learning modules.

An intuitive app generator and accompanying e-learning...

All products created by the partners are shared as open source; Teatr Grodzki, eLearning Studios, Eldeberry AB, GAIA Museum Outsider Art, BEST, and Symbiosis have advertised and promoted them during multiplier events, such as partner meetings, trainings, workshops, and conferences, to make VET educators aware of their existence and value.

Present-day European societies and job markets are gradually opening up to those who have so far been disadvantaged and unable to fully participate in their structures. CMI2 partners decided to go one step further and actually equip people who have broadly understood learning difficulties with custom-made IT tools to assist them and contribute to their personal and professional success.

Acknowledgements

The author of this paper would like to sincerely thank all the project partners and in particular its leader, Ms. Jolanta Kajmowicz-Sopicka, for the opportunity to take part in this invaluable undertaking. She would also like to extend her gratitude to Dr. Maria Zajac for her support and encouragement.

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Abstract

In this article, the author, who was a member of the Erasmus+ Count Me In Too project, endeavors to demonstrate that the assistive technology developed within the project provides effective context-aware assistance for people with learning difficulties, for whom the project was aimed. She discusses in detail the intuitive app generator created by eLearning Studios (Coventry, Great Britain), 2 (of 11) training apps designed by Teatr Grodzki (Bielsko-Biala, Poland), and the e-learning modules supplementing the apps, with theoretical foundation laid by Eldeberry AB (Hägersten, Sweden).

The author shows how personalized IT tools facilitate education and improve job performance of people with disabilities, thus helping them achieve personal and professional success. The partners were, among others, motivated by the fact that European societies and job markets are gradually becoming more inclusive towards people with disabilities.

The tools were successfully tested with over 300 learners in Denmark, Hungary, and Poland, and assessed by the project partners and vocational education and training specialists. The research proved that the tools, translated into national languages and forming a bank of educational resources to be followed or adapted by interested users, may inspire teachers, managers, and supervisors, and facilitate vocational training and other types of e-learning.

Keywords: assistive technology, app generator, training apps, e-learning modules, context-aware assistance

Magdalena Brzezinska is a graduate of Adam Mickiewicz University in Poznan, Poland. She is a sworn translator, EFL teacher with over 20 years of experience, teacher trainer, and international conference speaker. Previously, she was an assistant lecturer at the University of Warmia and Masuria, Poland. At present, she teaches General and Business English to students of the WSB University in Poznan. She is a member of Virtual Round Table/ Language web conference and Membership Officer for the international Visual Arts Circle, as she strongly believes in the value of arts and ICT in education. Magdalena took part in the Erasmus+ Count Me In 2 project, which she discusses in this article, in a variety of roles, e.g., teaching workshops on how to design instructional apps.

WE RECOMMEND

European Commission works on the next Erasmus programme 2021–2027

On 30 May, the Commission adopted its proposal for the next Erasmus programme, with a doubling of the budget to 30 billion euros for the period 2021–2027.

Building on the success of Erasmus+, the next programme will provide learning and mobility opportunities to 12 million people, in comparison to 4 million people in the current programme. Its focus on “evolution, not revolution” means that the ‘Erasmus’ programme will continue to cover schools, vocational education and training, higher education and adult learning - youth and sport, but in a more streamlined manner. Building on the mid-term evaluation and stakeholder consultations, the next programme will be substantially strengthened, extended and more inclusive. It will further promote activities which foster knowledge and awareness of the EU, opportunities in forward-looking knowledge fields e.g. climate change, robotics etc. and better outreach and inclusion of people with fewer opportunities. The international dimension of the programme will also be boosted. Investing in people, their skills, and their knowledge will help respond to global challenges, maintain social fairness and drive Europe’s competitiveness.

More information: http://ec.europa.eu/programmes/erasmus-plus/news/commission-adopts-proposal-next-erasmus-programme-2021-2027_en



Development of soft skills as a part of an LSP course

Joanna Kic-Drgas*

Due to changes to the modern working model (task-oriented projects, focus on team work, intense competition with other companies, staff mobility, outsourcing of services, increasing expectations toward prospective co-workers), mastering a set of soft skills seems to be one of the most important requirements – next to professional expertise – that can enhance the efficacy and quality of realized undertakings. However, the need to implement soft skills in a professional environment does not always accompany training, and whenever they are developed in the workplace they are necessarily developed in action.

Introduction

The existing demand for completing a set of pre-requisite qualifications can be satisfied by offering soft skills practice training, either within the academic curriculum or within a company, or through a synergetic combination of soft skills development with other forms of training. This article describes possibilities for designing and implementing soft skills training methods that can be offered as an integral part of an LSP (Language for Specific Purposes) course from the perspective of LSP teachers.

The following questions lay the foundations for the considerations developed in this paper:

- Can soft skills be developed as a part of an LSP course?
- Which soft skills can be incorporated in an LSP program?
- How can the chosen soft skills be developed/integrated within the LSP classroom?

On the one hand, the methodology used to prepare and conduct soft skill-oriented tasks for LSP classes is an issue (and not an obvious choice, because the methodology described in the literature refers either to soft skills training or teaching language for specific purposes). On the other hand, the question of which instruments to use to discuss the results of the conducted tasks arises. The aim of this paper is to check the potential for interdisciplinary solutions to improve professional communication and test the methods for

teaching core soft skills in an academic setting. The following paper is divided into three sections.

The first section consists of the theoretical part; in this section, different approaches to various soft skills phenomena are presented, and the link between soft skills and language, as well as their function in the work place, is analyzed. The focus of the second section is about soft skills-oriented teaching of language for professional needs. The third part of the paper presents the results of a survey conducted among LSP teachers representing different languages, in order to identify the possibilities of soft skills training implementation within the LSP curricula and compare it with skills that have been trained in reality. In the final section, conclusions and perspectives on the analyzed issue are discussed.

Literature review

Definition of soft skills

The meaning of “soft skills” has rapidly changed as a result of globalization, the explosion of information technology, and the competitiveness of the modern job market. Developing soft skills has become a prerequisite for success in the knowledge-based economy. However, the definition of this phenomenon leads to discussions between scientists. The fact that various authors list different skills and group them in various manners adds to the complexity of this question.

Bhatnagar and Bhatnagar (2012, p. 3) contrast soft skills with hard skills and refer to them as communication in the professional setting. In a broader sense, they are linked to the human abilities of processing knowledge and problem solving; however, in the narrower sense, soft skills are understood as coexisting with other people through, for example, active listening, formulating efficient and precise messages, negotiating, etc. Generally, soft skills are meant as “interpersonal competencies” that *are more difficult to define due to their subjectivity, which consequently makes*

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them difficult to measure (Bhatnagar and Bhatnagar, 2012, p. 4). The main difficulties with formulating one coherent definition widen due to the multidimensional nature of the phenomena included in the multitude of diverse categories – for instance, listening skills, communication skills, team-building skills, leadership skills, persuasion skills, and counseling.

For example, Nieragden (2000) introduces the following classification system of soft skills:

- interaction (such as attitude awareness, conflict handling, tolerance),
- self-management (such as decision-making, willingness to learn, self-discipline and resistance to stress),
- communication (such as listening skills and presentation skills),
- organization (problem solving).

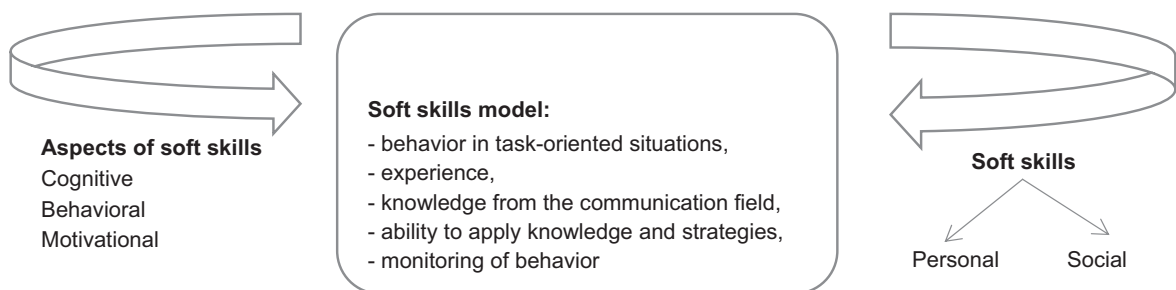
Yadav (2012, p. 196) analyses soft skills through communication, presentation, and teamwork, strongly underlining the fact that soft skills should be taught at the university level. The main reason for developing them is their impact on career choice, making appropriate decisions, and engaging in effective communication, emphasizing the tight relationship between soft skills and language function. An interesting contribution to the discussion on soft skills is given by Ramesh and Ramesh (2010, p. 4), who emphasize that soft skills *do not equal good language command and vocabulary*, which stands in contrast to

the communication skills mentioned in the other cited definitions. Soft skills relate more to the ability to choose an appropriate register in a certain situation. All the same, it is worth stressing that soft skills are strongly rooted in the linguistic context (Ramesh and Ramesh, 2010, p. 4).

In her reflection on soft skills, Fastnacht (2006, pp. 109–110) also takes individual aspects of soft skills into consideration and defines them as human potential, developed in a task-related environment. The specific character of soft skills in social relations is depicted in the model of soft skills presented in figure 1.

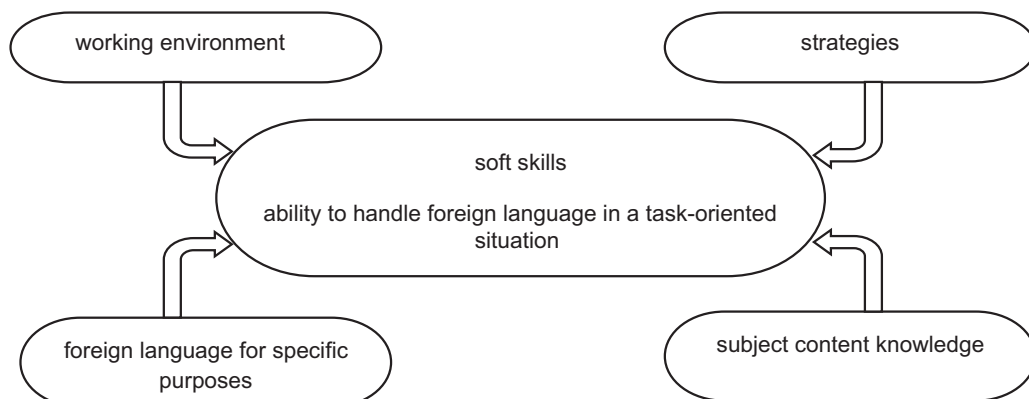
The presented model is based on the trichotomy of the functions of soft skills, which illustrates the three main directions of research on the topic: behavioral, cognitive, and motivational. The behavioral aspect studies the patterns of behavior of individuals facing certain situations and the simultaneous reaction of the audience towards the communicative measures taken, especially when dealing with a given task. The cognitive dimension can be characterized as the ability to analyze a given situation and work out an accurate interpersonal strategy – frequently understood as emotional intelligence. The motivational aspect highlights the meaning of individual features (like the ability to raise an interpersonal challenge in a communicative situation) that determine flawless communication (Fastnacht, 2006, p. 111).

Figure 1. Soft skills model



Source: Fastnacht (2006, p. 111).

Figure 2. Soft skills in the LSP context



Source: author's findings.

Development of soft skills as a part of an LSP course

To conclude, the cited definitions show the wide scope of meanings attributed to soft skills by different researchers. Simultaneously, it is worth emphasizing that, due to their utility in authentic professional situations, their introduction into the LSP teaching process is necessary. However, a reformation of the definition is needed, due to the complex individual, but also highly task-oriented, nature in the teaching process.

In this respect, soft skills can be understood as an ability to handle strategies for implementing foreign language and subject content knowledge in a professional environment, in order to cope with professional tasks. Consequently, the development of soft skills should be closely related to the development of strategies and techniques necessary for coping with professional situations.

The meaning of soft skills in the university and corporate environment

The meaning of soft skills can be observed in both the university and professional environments, which proves the legitimacy of the statement that their development goes along with lifelong learning principles and should be initiated at the university level. Chamorro-Premuzic et al. (2010, p. 221) emphasize that *unlike academic or disciplinary knowledge, which is subject-based, content specific and formally assessed, soft skills comprise a range of competencies that are independent of, albeit often developed by, formal curricula and rarely assessed explicitly.*

Elena Tevdovska (2015) also presents arguments for the importance of soft skills in the context of higher education and in favor of integrating them in the curriculum of the foreign language learning classroom, based on the results of the survey conducted among MA and PhD students in an EFL (English as a foreign language) classroom at South East European University, who were simultaneously working. Tevdovska (2015) concludes that the majority of students are aware of being in the position to use or lack soft skills. Participants in the survey noted that the *connection between them, other colleagues or between the supervisors or the subordinates can and should be improved* by implementing soft skills (Tevdovska, 2015, p. 100). Concerning language skills and knowledge, all of the participants admitted that they have to communicate in English at the workplace, mostly via email. Interestingly, *when asked if their undergraduate studies could have prepared them to understand and deal better with these situations, most of them replied affirmatively and the majority (20) stated that the skills of understanding and communicating with others can be learned* (Tevdovska, 2015, p. 102).

Kwiecińska-Zdrenka (2012, p. 13) analyzed the corporate environment and the use of soft skills and reported on the way entrepreneurs and potential employers perceive soft skills in the context of the pragmatic skills their employees offer in the workplace. The majority of the survey participants pointed to cooperativeness and communicativeness

as the most basic soft skills. In the given answers, the meaning of negotiating skills, assertiveness, and the ability to present one's opinions in a clear and transparent way were also highlighted. In their statements, few interviewees identified the ability to deal with stress and time pressure. The answers given prove the wide spectrum of influence that soft skills have on workplace efficiency. In the study, employers were also asked to estimate the meaning of soft skills, both within company life and in communication with external companies and clients. In both cases, participants in the survey admitted that soft skills play an important role and that the lack of soft skills causes a deterioration in the atmosphere at work and prolongs many procedures, not to mention hurts relations with external clients (Kwiecińska-Zdrenka, 2012, pp. 13–15).

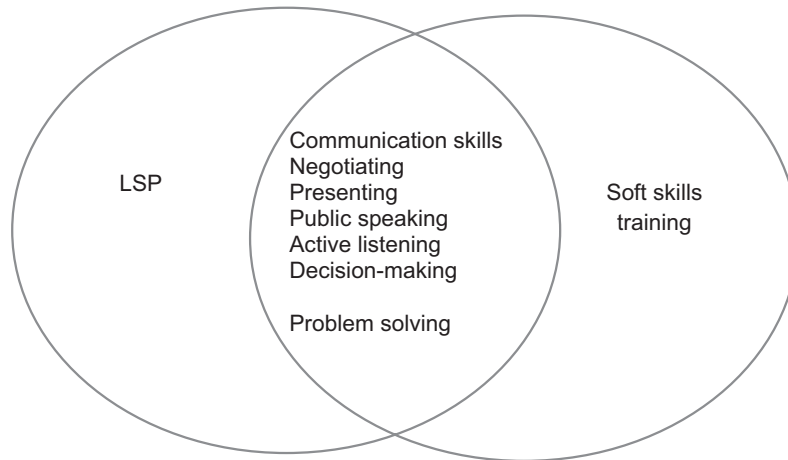
To summarize, in the approaches discussed in relation to the question of soft skills, it is worth mentioning that the field is relatively young, but is developing dynamically in response to the needs and requirements of the current job market. Although soft skills were initially analyzed in reference to the non-academic professional world, universities as institutions conducting research on communication and preparing graduates for their initial careers should teach soft skills. In addition, soft skills should not be associated solely with jargon, but with extended situation-oriented communication skills, which will be analyzed later in this article as a common foothold for ESP (English for Specific Purposes) and soft skills training.

Soft skills oriented LSP teaching

The teaching methods used in institutional classes focus mainly on one-way communication and do not affect abilities or patterns of behavior. In opposition to traditional methods, Fastnacht (2006, p. 113) suggests a model of teaching based on soft skills that involves the needs and interests of students in tandem with active ways of exercising behavioral, cognitive, and motivational aspects, in order to increase the attractiveness of developed workplace skills. Fastnacht perceives knowledge acquired through actively developing behavioral patterns as a means to achieve these aims.

Using language for specific purposes is closely connected to a work-oriented context. Students are drawn to LSP not only because of their interest in the English language, but also because of the necessity to fulfill tasks by using the language, such as writing an email, negotiating, presenting, etc. (Bracaj, 2014, p. 42). The students' needs are so essential for potential success in the course that *all decisions as to content and method are based on the learner's reason for learning* (Hutchinson and Waters, 1992, p. 19). Grygiel (2015, p. 77) underlines the fact that *language is a dynamic system and as such it evolves along three basic directions – in time (historically), in space (geographically) and in stratification (socially).* The third aspect of language can

Figure 3. Common areas of interest between soft skills and LSP



Source: author`s findings.

especially evolve, revealing the deep sustainability of professional language communication through socially driven mechanisms. In professional fields, the concise meaning of statements and the manner of presenting is far more important than in everyday life. Each person is equipped with a range of inborn skills allowing them to manage a specific field; however, their skills need *shaping, reshaping and refurbishing in most cases with training* (Mousawa and Elyas, 2015, p. 1058).

Soft skills improve one’s employability in the sense of their ability to cope with the challenges of the professional world. Communication skills, falling into many types (such as language proficiency, conversation, presentation, and behavioral patterns) form the basis of developing other soft skills in many cases (Schulz, 2008, pp. 146–152).

The mutual relationship between soft skills and language for specific purposes is depicted in figure 3.

Undeniably, some elements of soft skills training are present in the LSP classroom, although teachers and students are frequently unaware of their existence. Take presentations for example: even a few decades ago, their advantages were already appreciated in foreign language classrooms, where students were obliged to give short speeches on a given topic without the use of Power Point, which not only improved their language skills, but also increased their self-assurance and ability to highlight the most important elements in a speech.

Methods to implement soft skills oriented LSP

Nowadays, soft skills oriented LSP teaching is not only required to develop the tools needed to realize the main aims of the course, but also the instruments needed to measure the results and outcomes.

The aims of soft skills oriented LSP teaching can be formulated as follows. The following is the author’s suggested formulation for soft skills oriented LSP teaching:

- a) developing the communication skills needed at the workplace by using language specific to a certain field,
- b) using language for specific purposes in simulated situations (problem solving, decision-making, etc.), recalling real situations in the workplace,
- c) training of the speed of reactions to real-life situations,
- d) training of communication strategies,
- e) reinforcing teamwork,
- f) increasing individual motivation to learn LSP by showing real usage of the language in a professional environment.

Didactic methods and strategies used in soft skills oriented LSP teaching include the following (Price, 2015):

- Professionalism/work:
 - a) introducing checklists to monitor the progress of students,
 - b) tracking test scores to encourage self-assessment,
 - c) concentrating on defining “added value” after each class.
- Presentations:
 - a) preparation of professional Power Point presentations,
 - b) preparing and evaluating oral speeches accompanying prepared presentations.
- Teamwork:
 - a) giving tasks encouraging cooperation and teamwork,
 - b) reflecting on a cooperative model of working,
 - c) clearly defining responsibility.
- Oral communication:
 - a) using specific language in a professional context,
 - b) extending specific vocabulary,
 - c) organizing professional conversations,
 - d) negotiation role-playing.

Development of soft skills as a part of an LSP course

- Listening:
 - a) exercising active listening in conversations referring to the working environment,
 - b) playing original interviews, news, reports specific to the chosen field,
 - c) summarizing the most important issues mentioned in the audio,
 - d) listening for detail,
 - e) categorizing clue information.
- Written communication:
 - a) writing different genres typical for the working milieu, like emails, paragraphs, reports, etc.,
 - b) summarizing and synthesizing professional texts in written form,
 - c) characterizing the lexical and syntactic structure of specific texts,
 - d) preparing lists of specific terminology for the particular field.
- Problem solving
 - a) introducing problem solving activities simulating real situations from a work environment,
 - b) role-playing.

Research design

The described research is a quantitative study (a pilot study for an extensive research project), with the objectives of indicating which soft skills can be integrated into the LSP teaching process and of developing strategies of soft skills training implementation into the teaching of language for specific purposes.

Although the topic (of soft skills, J.K–D) is widely debated in all the countries, in some of them (Belgium, Finland, France, Germany, UK) there are many initiatives going on, whilst in some others (Greece, Italy, Spain) the topic is still developing (Clinque, 2016). To the knowledge of the author, research about the topic, as well as the literature about soft skills implementation in the foreign language teaching field, is relatively scarce in Poland, forming an additional motivation to undertake the following study.

Regarding the division of the countries made by Clinque (2016), Poland belongs to the still-developing countries in the context of any initiatives concerning the development of soft skills, which leads to the creation of an extended gap between the professional reality of international companies in which graduates are searching for employment and the preparation for future acting on the job market.

The study is encased in the quantitative side of the investigation and collects and analyzes LSP teachers' opinions on the subject. It is designed as a starting point for the preparation of a more detailed survey that will allow for a more extensive study of the topic. The following research questions were analyzed as a result of the study:

- Can soft skills be developed as a part of an LSP course?

- Which soft skills can be incorporated in an LSP program?
- How can the chosen soft skills be developed/integrated within the LSP classroom?

The author of the paper was inspired by the research conducted by Tevdovska (2015), which presents the utility of soft skills from a student perspective. The idea of the presented study was to look at the problem, taking the view of teachers/educators into account, and simultaneously showing opportunities that present themselves when soft skills are implemented in the teaching process.

Participants' profiles

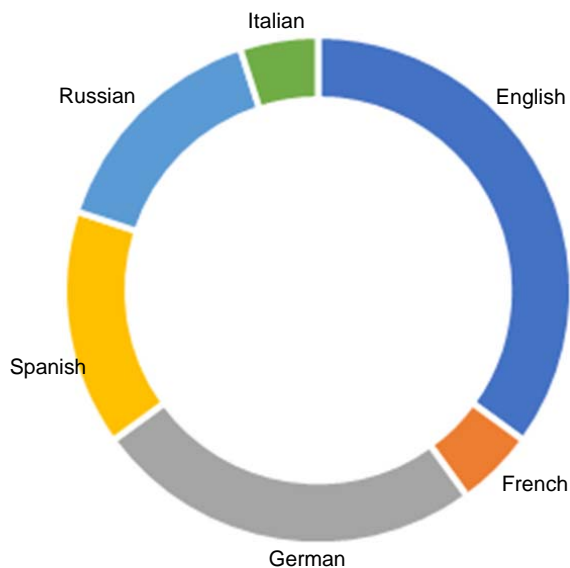
In the survey, twenty LSP teachers representing different institutions were asked about the potential possibilities of implementing soft skills development within their curricula. This sample has intentionally diverse characteristics regarding student proficiency levels, the languages, the kind of LSP (medical, economic, etc.) taught, and teaching experience.

All of the variables were crucial to present in order to respect the reality of pluralism within the teaching environment. The randomly selected group (20 individuals) constitutes a sample of diverse teachers' specificities, highlighting different views and different implementation possibilities within the issue of soft skills.

Each of the figures below provides information about the structure of the surveyed group.

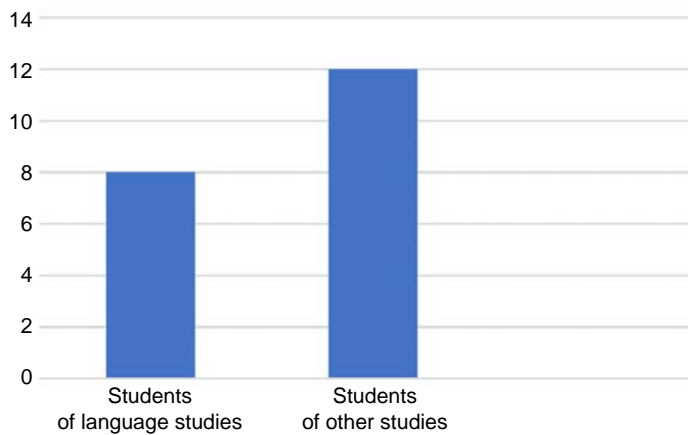
The largest groups of surveyed teachers were represented by English teachers (seven participants) and German teachers (five participants) (see figure 4), whereas the smallest group was represented by Russian teachers.

Figure 4. Languages taught by the teachers taking part in the survey



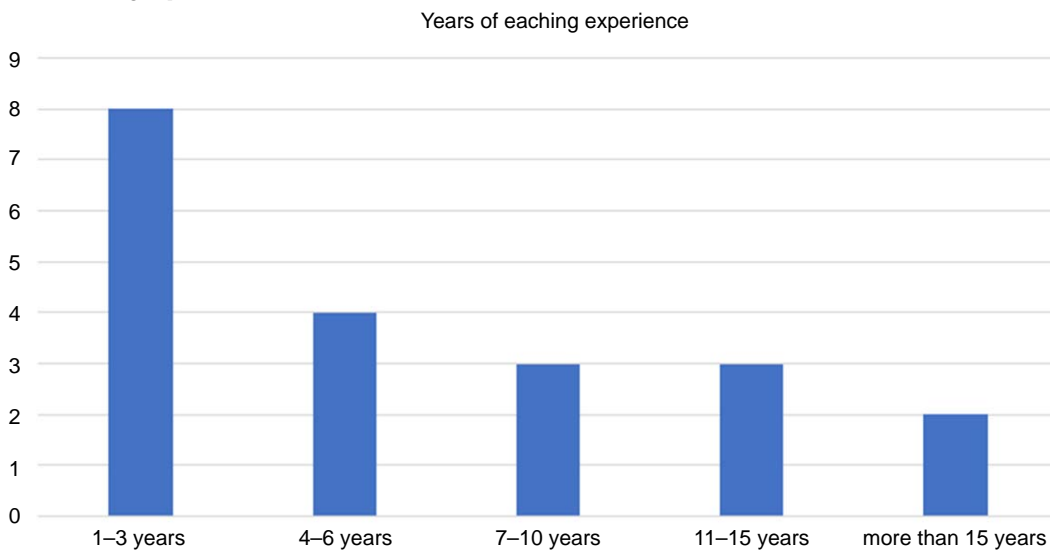
Source: author's findings.

Figure 5. Division by the group taught



Source: author`s findings.

Figure 6. Teaching experience



Source: author`s findings.

The surveyed teachers worked with different groups of learners. While all of the teachers were teaching adult students, the learners were divided into two groups: students of language studies and students who were not involved in language studies.

The relationship presented in figure 5 can be explained by the fact that teaching LSP has a much longer tradition in fields other than language studies.

Figure 6 depicts the interviewed teachers' years of experience teaching.

The majority of the surveyed LSP teachers (eight participants) had between one and three years of experience in teaching.

Methodology

The instrument used to conduct the study was a survey created by the author of this paper. The

designed tool was divided into two sections: one consisting of closed questions and another consisting of open questions. The first part referred to the experience of teachers in developing soft skills in the LSP classroom, whereas the second part considered their recommendations and suggestions. The first part of the survey consisted of four questions referring to their experience incorporating methods that developed soft skills within the LSP classroom. The second part of the survey dealt with their perspectives of soft skills being integrated in LSP teaching. The participating teachers were asked to answer three questions concerning this issue.

The described survey was conducted from September, 2017 to January, 2018 among twenty foreign language teachers teaching LSP at public and private institutions. The number of the participants is not representative, but it is to be considered a suggestion for further research on the topic.

Development of soft skills as a part of an LSP course

Results and discussion

Part one – experience

In answering the first question of part one, fifteen out of the twenty surveyed teachers declared that soft skills training should be part of LSP teaching. Two participants underlined the fact that soft skills training can be part of LSP teaching. Three interviewees had no opinion.

In the second question, twelve LSP teachers confirmed that they introduced elements of soft skills training as a part of their classes. The soft skills developed during the classes are shown in figure 6 below, and teachers could choose more than one answer.

The most frequently developed soft skills are discussions, teamwork, work planning, and developing argumentation strategies (figure 7). The least commonly developed skills are work ethic, business etiquette, and writing. The explanation for why the first two are relatively seldom developed in the LSP classroom may be because they are closely connected with corporate reality and require wider knowledge about corporate procedures, which is not easy to gain for a teacher who may have never worked in a company. The choice of soft skills was based on research found in the literature concerning skills needed in the work environment (see Fischer-Kania, 2008; Kwiecińska-Zdrenka, 2012).

The third question referred to the method used. In this question, teachers could choose among the following methods: exercises from the course book,

exercises they developed themselves, meetings with experts, role-playing and simulations, exercises prepared on the basis of authentic material, exercises developed by the project (Erasmus) partnership, organizing special seminars, and conducting projects with feedback concerning soft skills. Additionally, teachers could offer their own answers, but none of the participants extended the choice of methods.

Among the most frequently named methods of developing soft skills (question three), teachers mentioned exercises from books (eight teachers). Interestingly, the biggest group (six teachers) consisted of English teachers, which is probably a result of English having the most developed market of course books in comparison to other languages. Other responses were role-playing and simulations. Only one person pointed to bigger projects for developing more soft skills at once.

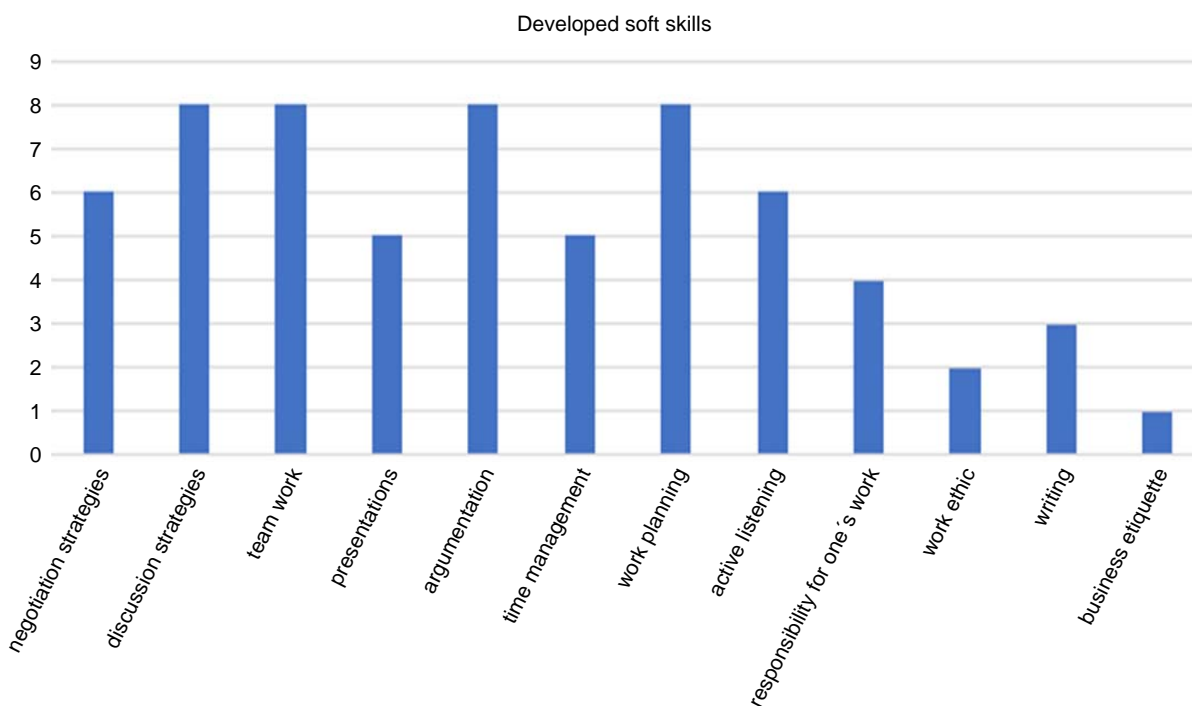
For the question concerning the frequency of introducing exercises oriented towards soft skills, seven teachers answered “once a month”, three answered “once every two weeks” and two answered “once a week”.

Part two – perspectives

In the first question, teachers were asked to give suggestions for developing soft skills in the LSP class (open question).

Only eleven teachers answered this question. Among the suggestions named by the participating teachers were several references to working with original data created in a professional environment and containing the element of expertise:

Figure 7. Skills developed in an LSP class



Source: author's findings.

- “confronting learners with original texts”,¹
- “simulations based on original data”,
- “cooperation with experts from a specific field”,
- “cooperation with a professional environment”.

The answers also included a suggestion of having more complex tasks in the form of a project:

- “develop bigger projects, also in cooperation with other institutions, countries”.

Developing materials that support soft skills training could be a real motivator and facilitator for many LSP teachers of languages other than English (this suggestion came from a French teacher).

Some of the participants of the survey highlighted the need for courses and training concerning subject content knowledge as an important factor in intensifying their soft skills training in the LSP class. Three teachers confirmed that they would spend more time on developing soft skills during their class, although they did not have any idea for how to do so. Another mentioned suggestion of the surveyed group was taking part in a special course devoted to the subject of soft skills.

The closed questions refer to the possibilities of integrating soft skills training in an LSP class. Twelve teachers declared that it is possible, three had doubts, three were not convinced and two rejected the idea.

In the last question, the teachers were asked about the possible positive effect that developing soft skills could have on the students’ future careers. The answers to the question are illustrated in figure 8.

According to the teachers, soft skills can be useful in the future lives of graduates, as they influence

different aspects of their professional careers. Only three teachers did not see any relation.

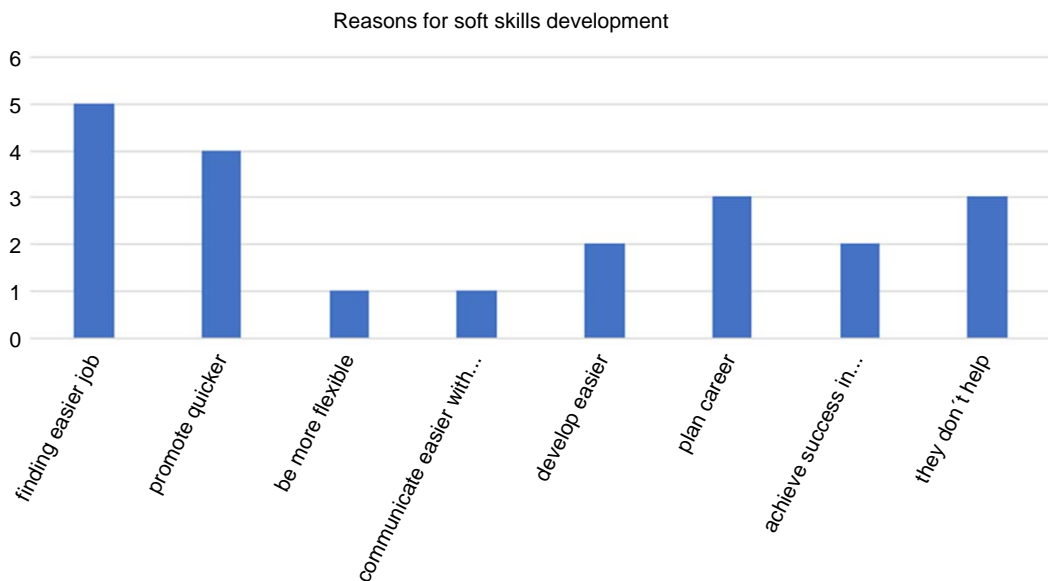
Conclusions

Soft skills, understood as individual skills making communication and cooperation in a professional environment easier through the application of assertiveness, creativity, understanding, stress resistance, etc., are dynamic, and their development is individually driven. Soft skills training in the LSP classroom gives a unique opportunity for developing soft skills in a company-like environment, with emphasis placed on individual needs.

However, the application of soft skills in an LSP course raises the need for developing specific methods and instruments supporting cooperation within both fields – LSP teaching and soft skills training. The described survey, designed as an introduction to more complex research, first presented considerations concerning the introduction of a soft skills training module as a part of LSP teaching. The answers of the teachers participating in the survey prove that integration is possible and needed, which is also confirmed by the research of Fischer-Kania (2008), Kwiecińska-Zdrenka (2012) and Tevdovska (2015). However, it requires the development of a special methodology, which can be concluded from the answers of the foreign language teachers participating in the survey.

The majority of teachers introduce exercises oriented towards soft skills once a month in an LSP class, which is a sign they have not developed appropriate strategies to encourage the development of their students’ soft skills potential on a regular basis. Soft skills develop-

Figure 8. Impact of soft skills on the future lives of graduates



Source: author’s findings.

¹ The answers were given in Polish and translated into English by the author.

Development of soft skills as a part of an LSP course

ment exercises do not last long and can be integrated into almost every activity. The most frequently trained skills named in the survey are discussions, teamwork, and developing argumentation strategies, whereas presentations, which are crucial to the corporate milieu, were mentioned by only five teachers. Writing is a relatively seldom-developed skill (mentioned by only three participants). The explanation of these results may stem from the fact that teachers do not know how to teach soft skills. This may be because they were not taught how to do so. Or, it may be because they have relatively little contact with the business sector. In some cases, they may not be aware of the importance of the development of certain soft skills, in contrast to the students, which may be the result of a lack of contact with a professional environment (Tevdovska, 2015). Relatively poor responses concerning the methods of developing soft skills (mainly based on course book exercises) support this conclusion and underline the need for topic-dedicated courses for teachers devoted to the methodology of the development of soft skills, which was also mentioned by the survey participants. The majority of the surveyed teachers see the need for and utility of developing soft skills.

The part of the survey that was devoted to the question of perspectives delivered information about possible methods of soft skills implementation and benefits and what they can offer in the classroom. According to the participants of the study, the creation of special materials to develop soft skills could be very helpful. Among the methods that could be implemented to develop soft skills, working with original texts was mentioned, as were more complex projects in cooperation with other institutions or countries.

Interestingly, the biggest benefit of developing soft skills in an LSP class that was named by the participants of the survey was finding a job. However, three participants stated that soft skills do not help at all in this matter, reflecting the ambiguity of opinions in this context.

The acquisition of skills at the university level – before commencing their professional careers – can make students more aware of the potential problems they may face and help them deal with them in the future, which is why it is worth considering the discussed directions for the specialization of LSP teaching at the university level.

The development of soft skills in ESP² is an important and interdisciplinary topic. The results of the survey strongly indicate the need for deeper analysis of its practical dimension. Due to editorial limitations, only some ideas from the given field can be presented in this paper, taking the form of tips for teachers to implement.

Soft skills training should primarily introduce authenticity and be tightly connected to a professional environment. This can be achieved through the use of authentic materials (emails, documents, corporate newsletters, etc.) or descriptions of authentic

situations (supported by figures and diagrams). Implementing the use of authentic materials provides contact with specific vocabulary used in real contexts, including situations related to corporate culture and intercultural differences. Plus, doing so often offers students initial contact with the layout of authentic documents. This should also be discussed in the classroom as a starting point for writing exercises.

A good and important point for planning soft skills development in the ESP classroom is the establishment of an authentic cooperation with representatives of the field (for example, graduates who are active in the labor market) or experts willing to share their experience. Cooperation with external specialists opens new perspectives for an interdisciplinary project and provides better insight into everyday life in the profession. There is a lack of materials combining subject-oriented issues and the training of soft skills, as these require a high workload from teachers, as well as constant updates of the subject content knowledge.

The development of soft skills can be supported by case-oriented teaching. One possible method of implementation is the use of authentic cases, based on real situations, and the encouragement of the development of problem-solving strategies and the argumentation and negotiation skills necessary to convince the rest of the group to choose the presented option.

A separate part of soft skills development requires students from different fields to deliver public speeches. For this, an adequate system of assessment and feedback is necessary. There is also a need for the introduction of argumentation strategies, in addition to necessary discourse markers.

The mentioned solutions are only exemplary suggestions signaled in the context of the discussed study and require further analysis.

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² This topic needs an extended description and will be the subject of a separate paper by the author.

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Abstract

The lack of knowledge of a foreign language for specific purposes and the increasing internationalization of domestic markets cause many communicative difficulties at the corporate level. Inefficient communication slows down decision-making processes and lowers the quality of services offered. In this respect, soft skills are gaining more and more importance in professional environments. Considering the need for providing a high level of foreign language even at the interview level, the idea of soft skills oriented LSP teaching can close the existing gap in employee training and enhance employees' chances for success in an international environment. This article presents results of a survey conducted among LSP teachers in Poland.

Keywords: soft skills, LSP, training, foreign language teaching strategies

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Smart skills and education in a future economy

Franciszek Kutrzeba*

Whether the role of education is to prepare people for employment or to have meaningful lives in general, it will identify and develop skills and competencies, as well as vocational and personal attributes. Skills, such as critical thinking, novel ideation, and complex cognitive and social skills, are areas where humans continue to outperform smart machines. The purpose of this article is to review the skills and competencies that will be in demand in the future, with an eye to recent technological changes. First, macroeconomic data concerning higher education will be reviewed in order to illustrate the situation of tertiary education, with a focus on Poland. A significant decline in demand for tertiary education has been observed in Poland in the last few years, despite the good returns on investment in education, which are the highest among the OECD countries. The empirical part of this paper presents results of a pilot survey that aimed to provide insight into several key competencies and vocational attributes that are perceived to be relevant for a future economy, according to Polish employers. The primary data was collected manually, using a quantitative survey on three occasions at two different job fairs in Gdansk in March 2017. Work experience, new media literacy, and formal education were assessed as least relevant variables ($x=13$); learning and diligence were assessed as most relevant according to the studied target group ($n=55$). Furthermore, the study showed specific differences in perception, depending on the size of the employer.

Higher education and demographic decline

The exact idea of the appropriate role of higher education institutions (HEI) today is widely discussed. The focus is typically either on economic competitiveness and efficiency or on social and cultural objectives. In other words, the competing visions regard education from a macro perspective – national or global, such as in human capital theory – or micro aspects that emphasize individual capabilities – such as in the human development and capabilities approach. Education can be also treated as a tool for spreading

democracy and human rights (Boni and Walker, 2013, pp. 1–3). From yet another perspective, education can serve as the development of skills and competencies, and professional and personal attributes (Brewer, 2013, after ILO, 2015, p. 2).

In the OECD countries, universities experienced an exceptional enrollment boom during the 1990's, where students were abandoning vocational education for the sake of an academic one (OECD, 2016a, p. 48). This educational boom should have already reached its zenith in all of the 27 EU countries and other OECD countries (Kwiek, 2015, p. 186). In Poland, the number of students grew by almost 500%, from 390.409 in 1990 to over 1.900.000 students in total¹ in 2006, and has been on decline ever since, falling to 1405.133 by the end of 2015 (MNiSW, 2013). Kwiek argues that the drastic decline in demand for education in Poland is a result of the cumulative effect of shrinking demographics and outmigration. The number of students in Poland might shrink by half, from the 2006 levels to 1.000,000 by 2025; while other more conservative predictions forecasts the number to fall to 1.260,000, a 55–65% decrease (Vincent-Lancrin, 2008, p. 45; Antonowicz, Godlewski, 2011, pp. 10–14; IBE, 2011, 110–111; EY/IBNGR, 2010, p. 20, after Kwiek, 2016, pp. 7–8).

In response to the urgent demographic issues and the challenges of globalization and the financial crisis, the European Commission set a series of objectives for achieving smart and sustainable economic growth. As means to protect European societies from the risk of poverty, three of these targets address the better use of human resources. Special attention has been paid to improving employment, skills, and labor through education, aiming for at least 40% of the younger generation to have a tertiary education degree (European Commission, 2010). Yet, as Sulkowski and Zawadzki note, having a university diploma does not necessarily guarantee that someone will be educated. On the contrary, they argue that there is a phenomena of “certified philistines” that can be observed today (Sulkowski, Zawadzki, 2016, p. 122).

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¹ The number of students participating in tertiary education in Poland includes private and public sectors and full and part time students.

It seems that universities and other higher education institutions must justify their existence. Enrollments in schooling are declining, especially in the United States. The costs of higher education are increasing faster than inflation, while the value of a university degree is falling (Barber, Donnelly, Rizvi, 2013, pp. 13–15). The returns are lower in the high-income OECD countries and lowest for non-OECD European, Middle East, and North African countries (Psacharopoulos, Patrinos, 2004, p. 112). A significant decline in demand for education has been observed in Poland, but the returns of investment in education are the highest among the OECD countries. Meanwhile, the return for skills in Poland is a little above the average (OECD, 2016a, p. 47). This observation is supported by a study of Psacharopoulos and Patrinos (2004), according to which the returns to education are higher in low- and middle-income countries. They point out that there are tangible and measurable returns to investment in education on a micro level, although “such evidence is not as consistent and forthcoming in the macro literature” (Psacharopoulos and Patrinos, 2004, p. 118). Limitations of macroeconomic evidence of schooling benefitting different individuals should involve consideration of wider benefits. Such benefits – sometimes called externalities, spillover benefits, or social rates of return – are hard to capture for the educated person, his/her society, and economists (Psacharopoulos, Patrinos, 2004, p. 117; Temple, 2002, pp. 5–46).

Over-education and skills mismatch are some macroeconomic reasons for the dissatisfaction of highly educated workers (Kocór, 2015, pp. 12–25). Even though people with a HE diploma have higher earnings in Poland than lower educated people do, the qualifications mismatch has tripled in the years 1988–2008 (Kiersztyn, 2011, p. 11). According to Budria and Moro-Egido’s research, “significant proportion of the labor force in developed countries has more education than is actually required for their jobs, i.e. is overqualified” (Budria, Moro-Egido, 2014, p. 2). Nevertheless, one of the limitations in gaining reliable data regarding the relation between education (or acquired competencies, knowledge, qualifications, and skills) and demand of particular labor characteristics is the fact that it is done subjectively by the employees (Kiersztyn, 2011, p. 10; Pacuska, 2014, p. 8).

Future skills

Automation should facilitate and improve productivity, and it could also help offset the impact of a declining share of the working-age population that many countries are struggling with (McKinsey Global Institute, 2017, p. 9). Tasks that cannot be substituted by automation are often complemented, as most work processes involve multifaceted set of inputs, e.g., creativity and rote repetition or technical mastery and intuitive judgment. The complementation of work processes occurs typically in the routine cognitive and routine manual tasks, hence increasing the economic value of remaining tasks (Author, 2015a, pp. 129–179).

Computerization substitutes better for tasks that are routine-based, rather than non-routine-based tasks, because they are easily codifiable and characterized with high predictability. An increase in computer capital reduces the labor input of routine cognitive and manual tasks, but increases the labor input of non-routine cognitive tasks. This has led to favoring educated workers – people who are able to solve tasks characterized by high unpredictability and complexity and non-routine cognitive abilities such as creativity, critical thinking, or complex communication (Autor, Levy, Murnane, 2003, pp. 2–4; McKinsey, 2017, p. 8). Critical thinking is not about swapping opinions, but is rather about reasoning in a constructive manner involving evaluation of reasoned judgment in a sophisticated epistemic manner. For Kuhn (1999), “critical thinking by definition involves reflecting on what is known and how that knowledge is justified” (p. 23). Sulkowski and Zawadzki (2016) advocate for the idea of higher education as a sphere where young people can critically think about the knowledge they gain. They note that individuals lacking critical thinking become alienated and disengaged consumers, which in turn fosters cynicism. Moreover, they argue that critical thought is under assault in Western democratic societies; social environments of universities require a renewal in order to educate “engaged thoughtful citizens” instead of a “swarm of manipulated consumers” (Sulkowski, Zawadzki, 2016, pp. 122–123). According to a study by Richard Arum and Josipa Roksa, 45% of the studied samples (more than 2300 students) from American colleges and universities did not demonstrate any significant improvement on a Collegiate Learning Assessment during two years of higher education studies (Brynjolfsson, McAfee, 2014, p. 90).

On the other hand, computers (smart machines) are inferior to humans in coming up with new good ideas or engaging in complex communication. They are specialized in one or a few tasks, one at a time, while a single human being can be specialized e.g., in journalism, photography, gardening, and cooking simultaneously. People can conduct multiple and highly differentiated tasks, whereas robots require deprogramming depending on the task. Humans still excel in generating novel patterns, logical reasoning, coordination between multiple agents, communication in natural language, emotional intelligence, and moving around in diverse environments (McKinsey Global Institute, 2017, pp. 1–148). Good communication skills not only provide human labor with a competitive advantage over machines, but they also constitute a source of job satisfaction and wellbeing for workers and service recipients. According to Maguire and Pitceathly’s (2002) study on doctor-patient communication, healthcare benefits from good communication skills of the doctors: patients’ problems were identified more accurately, patients were more willing to comply with treatment, their distress and depression were lessened, and they showed more satisfaction with their care (p. 325).

Skills that relate to social interaction are also crucial for knowledge creation and learning. Some theorists argue that knowledge is created through cognitive experience and starts from socialization (Nonaka, Toyoma, 2003, p. 4), which in turn, according to Piaget, entails the learning of cognitive, personal, and social skills that allow people to function appropriately in their communities (Piaget, 1929; 1965, after Gould, Howson, 2015, pp. 1–6). Similarly, Wenger et al. (2002, pp. 3–7) argue that social interaction generates knowledge and facilitates knowledge sharing and learning.

Acemoglu and Autor suggest a two-by-two matrix, where work is divided into cognitive versus manual and routine versus non-routine work. They found that non-routine manual work (e.g., hairdressing) and cognitive work (e.g., financial analysis) are still in demand, while a dramatic decrease in demand for routine tasks, whether cognitive or manual, is observable. Based on Acemoglu's and Autor's work, Jaimovich and Siu found that, between 2001 and 2011, "routine cognitive tasks such as cashiers, mail clerks, and bank tellers and routine manual tasks such as machine operators, cement masons, and dressmaker" (Brynjolfsson, McAfee, 2014, p. 66) plummeted by 11%, and that this was the third decade in a row that they had decreased. On the contrary, non-routine cognitive and manual jobs had increased during that same period. Autor (2015) notes that the possibility of replacing human employment with computers is exaggerated and that human intuition and the value of interaction of human labor, human judgment, and automation are often underestimated in productivity growth measurements (after Parviainen et al., 2017, p. 13).

Empirical study

"Education prepares people for employment and, importantly, for meaningful lives" (Nussbaum, 2010, p. 9). Having this in mind, it is relevant to identify attributes that should be emphasized in education, from the perspective of students, academics, researchers, and employers. For the purpose of this article, a pilot study was conducted. Its objective was to provide insight into employer perception of chosen competencies and skills in Poland. Note that the terms "competence" and "skill" are sometimes used interchangeably in English (ILO, 2015, p. 2); this constituted the biggest problem for the author in planning the research. How to denote an indifferent set of variables with a common name? The logic behind naming the set of variables as competences follows partly an explanation from Prahalad and Hamel (1990): "... a portfolio of core competencies – the company's collective knowledge about how to coordinate diverse production skills and technologies" (p. 3) In line with this quote, the author understands competences as a set that comprises both skills and knowledge. Con-

trary to "employer's expectations", competencies are not limited to the employer-employee relation; they are transferable to various contexts in life.

The survey was conducted in Gdansk (Poland) in March and May, 2017, as a part of a doctoral dissertation. The research question was: what attributes will be on demand in a robotized future economy according to Polish employers? Furthermore, is there a consensus regarding key competencies between Polish employers and the international data presented by large international research institutions?

Method

A quantitative survey was used to answer the research question. The sample frame was chosen using the convenience sampling method, as the point was to test the measuring instrument. Hence two significant job fairs were chosen on the basis of similarity in terms of time (March) and place (Pommer voivodship). The sample was selected using the probabilistic systematic sampling method.

The primary data was collected manually, using a quantitative survey on three occasions at two different job fairs in Gdansk. The first job fair – International Metropolitan Fairs of Job, Education and Entrepreneurship (Metropolitalne Targi Pracy Pomorza) – was held at The AMBEREXPO Exhibition and Convention Centre of the MTG SA Gdańsk International Fair Co. in March 2nd 2017 and the second – Engineering Job Fair (Inżynierskie Targi Pracy) – was held at the University of Technology Gdansk, March 8–9, 2017. The questionnaires were handed out personally by the researcher to the participants. Thirty-one usable questionnaires were collected from employers at the AmberExpo Fair (n=100), and 24 at the Engineering Job Fair (n=59), totaling 55 usable questionnaires.

The survey variables were selected on the basis of outlined competencies and skills within the recent scientific discourse – most notably in the works of Autor, Levy, Murnane (2003); Acemoglu, Autor, (2011); Brynjolfsson, McAfee (2014); Sulkowski, Zawadzki, (2016) – and the variables most frequently mentioned in the following studies and reports: "Future Work Skills 2020 Report" (IFTF, 2011); "The future of work: jobs and skills in 2030" (UK Commission for Employment and Skills, 2014); "The Future of Education and Skills: an OECD Education 2030 Framework" (OECD, 2016b); and "A future that works: automation, employment, and productivity" (McKinsey Global Institute, 2017). Moreover, the author decided to include two traditional attributes that were omitted in the aforementioned studies and reports: 1) diligence,² 2) obedience, and loyalty.³

The list of variables was shortened down to 13 to fit A4-sized paper, which should facilitate sustained participant engagement. One optional line was also added to allow respondents to type in a variable of

² Diligence indicates work ethic and is mentioned as a virtue in all of the largest religions/philosophies.

³ Apart from technical and social skills, competencies include professional and personal attributes.

their own choice. All variables were measured with a multiple five-point Likert-type scales ranging from 1 to 5, from totally unimportant to very important, respectively. The purpose of the study was presented and respondents were then asked to assess the importance of particular variables for a future economy. Finally, respondents were asked about the size of the firm (M=micro-enterprise; SME=small and medium-sized enterprise; L=large enterprise), as defined in the European Union recommendation 2003/361⁴ and to define the branch they operate in.

Analysis, results and comments

Due to the chosen non-probabilistic sampling method (convenience sampling) and the relative small size of the sample (n=55), the author has decided not to conduct advanced statistical tests. Hence statistical inference will be unsuitable (Szreder, 2004); the results should be treated with utmost prudence. Table 1 presents a full list of studied variables and the mean values for n=55. The sample group consisted of 14 SMEs, 38 large, and 3 micro enterprises. The chart in figure 1 includes six variables that gained largest and smallest mean absolute deviations for the two main sample groups, based on the size of respondents' firms. Controlling these variables provide a better idea of the spread of the dataset than controlling the mean values would. According to the mean absolute deviation of this data set (n=55), the smallest deviation among respondents was observed for "Diligence," which also gained the largest mean value (4.67 for

n=55) of all assessed variables, and the largest deviations were observed for "Proficiency in the use of new media" (D=1.01; m=3.45), "Formal education" (D=0.89; m=3.2), and "Work experience" (D=0.89; m=3.43), which signifies a relatively small consistency in respondent opinions given the Likert scale used for this study, where 1 equals "totally unimportant".

Three especially interesting things can be said about the results:

1. Loyalty is relatively irrelevant for a future economy, according to the tested target group, and this does not differ much from the actual trend of the corporate Western world, where quick staff turnover has become a norm.
2. Relatively low mean value for "Work experience" ($m_{Large}=3,29$) for large enterprises and relatively high rates for "Complex problem solving" ($m_{SME}=4,79$) for SME's could be explained by the fact that most of the large companies were seeking low-skilled workers, while the SME's had open vacancies for high-skilled workers. These are nevertheless inferences of disputable value since such variables were not empirically measured in this study.
3. The low values ($m=3,45$; $n=55$) for the "Proficiency in the use of new media" differs significantly from noteworthy international studies on future skills, according to which such skills as "Data literacy" or "New media literacy" will be some of the top ten skills demanded in 2020 (UK Commission for Employment and Skills, 2014, p. 54; IFTF, 2011, pp. 8–12).

Table 1. Assessed variables, mean values and mean absolute deviation for n = 55

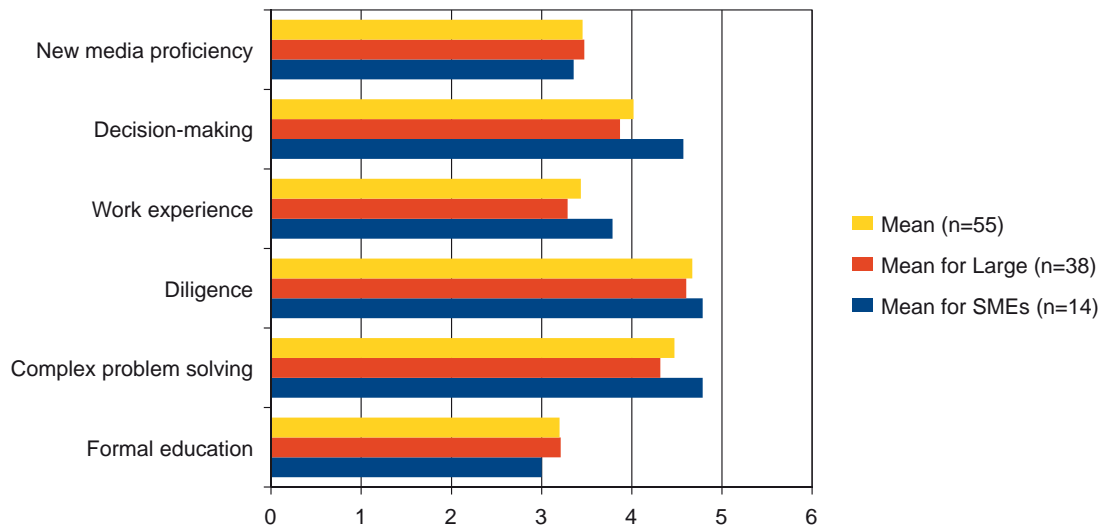
Future economy needs people that:	m	MAD
1. have formal education	3.20	0.89
2. have critical thinking skills	3.98	0.79
3. have complex problem solving skills	4.47	0.58
4. are creative	4.40	0.59
5. are diligent	4.67	0.46
6. are obedient and loyal	3.79	0.83
7. have learning skills	4.49	0.59
8. have work experience	3.43	0.89
9. make decisions	4.05	0.55
10. manage complex cognitive skills	4.02	0.73
11. can work in a culturally diverse environment (incl. foreign language skills)	3.93	0.87
12. have emotional intelligence (communication, empathy, interpersonal skills, flexibility, teamwork)	4.16	0.67
13. are proficient in the use of new media (online videos, blogs, presentations, portals, social media, etc.)	3.45	1.01

Source: author's findings.

⁴ < 10 employees and < 10 million €= Micro; < 250 employees and < 50 million €= SME; > 250 employees and > 50 million €= Large.

Smart skills and education in a future economy

Figure 1. Three Max(MAD) and three Min(MAD) values compared between two control groups ($n_{\text{Large}} = 38$ and $n_{\text{SME}} = 14$)



Source: author's findings.

If development of the competencies and skills mentioned in the reviewed theory is one of the keystones for building a knowledge-based, ICT-intensive economy that relies on smart machines both in production and services, then not enhancing these skills should lessen both individuals' and economies' competitiveness relative to offered technological solutions. Therefore, the author suggests referring to such skills collectively as "smart skills." Smart skills are *skills that make people outperform smart machines*. This term could be used in opposition to skills that are needed for performing routine, whether cognitive or manual, repetitive and rote tasks. The term smart skills is meant to be an open class of variables with a stable definition, so that the particular skills could be changed when necessary, as soon as they become outdated – i.e., as soon as machines have outclassed people in a particular skill. The term smart competencies is defined as *competences that make people outperform smart machines*.

Conclusions

Technological development has provoked organizational changes that favors skilled over unskilled labor. Workers that have general skills and are familiar with multitasking can better adapt to organizational changes and thus benefit from such transformations. The skills that will be in demand in the future smart economy will rely highly on complex cognitive abilities. As smart machines take over routine manufacturing and rote service jobs, skills that are closely related to complex social interaction (people management, emotional intelligence, problem solving skills, creativity, critical thinking, and adaptability – all of which are mostly characterized by high level of cognitive complexity) should be developed, if human labor is to be competitive against machines. Knowledge

workers especially can maintain their competitive advantage over machines by improving the skills of complex communication, ideation, and large-frame pattern recognition rather than the skills required for performance of easily codifiable tasks. Theoretically, any task that is codifiable can be conducted by a smart machine, but only task one at a time – multifaceted jobs are still far out of reach of the newest technology. Tasks that require complex problem solving, critical thinking, creativity, and complex communication will likely be performed by humans. Unlike low labor costs, complex skills will gain competitive advantage in the long run and those with them will be better off during technological transformations (Parviainen et al., 2017). If, along with the decreasing population in Poland, the decreased nominal value of formal education causes a decline in demand for tertiary education, then future research should evaluate whether education is offering adequate training and frames for future social agents to meet the competence expectations of the labor market.

According to the conducted empirical study, attributes such as "New media literacy" skills and "Formal education" gained the lowest rates of all measured variables. Regarding the former, the reason behind such a low rate could be the content of the variable itself. "New media literacy," s used in the UK commissions report on future skills, unlike the IFTF report, includes Big Data analysis, interpretation, and efficient use of data, whereas the variable used in this study interprets new media as online videos, blogs, presentations, portals, or social media – instruments that are either not yet efficiently used by Polish enterprises or/and used for entertainment purposes only. Secondly, the surprisingly low rate of formal education could imply yet another, qualitative reason for the low demand for education in Poland. Nevertheless, the author suggests skepticism of the

validity of this pilot study, considering the number of assessed companies. For instance, according to an extensive study on diagnosis and competence development conducted by Miś, Poczowski and Urban (2013), formal education is extremely important for employers in Poland; 59 out of 60 job positions, which were offered by almost 200 companies taking part in the research, declared higher education as one of the competency requirements (Miś, Poczowski, Urban, 2013, pp. 50–79).

Apart from “New media literacy” and the “Ability to work in a culturally diverse environment (incl. foreign language skills)”, which gained a mean value slightly below average, the perception of future skills between the studied target group and analyzed secondary data is consistent. Analysis of the indications of or reasons behind that could be subject to further research. Most importantly, though, the study should be validated on a representative study group.

Development of smart skills and smart competences seems to be necessary for any individual to be attractive on the labor market, taking into account increasing automation. The question is: what should higher education’s role be in smart skills and competencies? Future research should investigate whether smart skills and competences are embraced in particular education programs and how they are dealt with.

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Abstract

Regardless of whether the adopted role of education is to prepare people for pursuing employment or building general values, it will include the identification and development of skills and competences as well as professional and personal attributes. Critical thinking, ingenuity and complex cognitive-social skills are precisely those areas in which people continue to outdo intelligent machines. The purpose of this article is to review the skills and competences that will be desirable in the future in relation to recent technological changes. They are preceded by selected macroeconomic data to illustrate the situation of higher education with an emphasis on Poland, where, despite positive returns on investment in education (the highest among OECD countries), since 2005 a systematic fall in demand for higher education has been observed. The empirical part presents the results of a pilot study aimed at determining the desired future skills and professional attributes of Polish employers. The basic data was collected manually using a quantitative study during three sessions at two different job fairs in Gdańsk in March 2017. According to the surveyed respondents (n = 55), professional experience, proficiency in the use of new media and formal education were indicated as the least important features, while learning and diligence – as the key competences for the future economy. In addition, the studies have shown the differences in the perception of these abilities and competences depending on the employer's position on the market, the number of employees and the internal policies of the companies.

Keywords: smart skills, higher education, critical thinking, smart competencies, future economy

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The Characteristics of Generation Z

Anna Dolot*

The presence and cooperation of different age groups within the labor market is not only an interesting and unprecedented situation, but it is also a challenge for different groups of people: managers, human resources specialists, and co-workers. The youngest generation – called Generation Z – was born and raised in completely different circumstances than the other, older generations. Although representatives of Generation Z have only just joined the labor market, there are already opinions and characteristics of them. The aim of this paper is firstly to gather and analyse different opinions and characteristics of Generation Z present in the literature. The second aim is to verify those opinions and characteristics with a sample group of Generation Z representatives by asking them which of those opinions and characteristics they identify with. The results of the presented research may be useful for all those who interact with the youngest generation in the labor market.

Although every human is an individual, there have already been many attempts to make generalizations and define different groups of people. One of the results of generalization is the creation of the term of “generations”. Generations are defined as an identifiable group that share birth years, age location, and significant life events at critical developmental stages (Kupperschmidt, 2000, p. 66). Mannheim brought crucial input to the development of the term “generation”, highlighting the fact that the phenomenon of generations is one of the basic factors contributing to the origin of the dynamics of historical development (Mannheim, 1952, p. 320).

Spending lives under equitable conditions (e.g., economical, historical), being exposed to the same events (e.g., cultural, environmental), and being impacted by similar technologies may influence people enough that they think, make decisions, and behave in a similar way.

It should be highlighted that defining generation boundaries is problematic. To date, most research into generational differences has been conducted in the US, UK, and Canada (Cennamo and Gardner, 2008,

p. 892). Meanwhile, because of the significance of the issue – its influence, for instance, on the economy, labor market, and organizations’ marketing strategies – emerging new generations and their characteristics are considered with interest all over the world. Age and generation differences and management is and will be even more a necessity for enterprises operating in the environment and economy (May, 2015, pp. 104–106),

At least five different generations are identified in the modern world:

- a) The traditionalists (Silent Generation or the Greatest Generation), born between 1928 and 1944, who value authority and a top-down management approach,
- b) The Baby Boomer Generation, born between 1945 and 1965, who tend to be workaholics,
- c) Generation X, born between 1965 and 1979, a generation who is comfortable with authority and view the work-life balance as important,
- d) Generation Y, born between 1980 and 1995 and who generally grew up in prosperity and have technology savvy,
- e) Generation Z, born after 1995 (Cilliers, 2017, pp. 189–190).

However there is no consensus in the area of defining abovementioned generations’ age range (Aniszewska, 2015, p. 3; Bednarska, Grobelna, 2017, pp. 109–110; Żarczyńska-Dobiesz, Chomałowska, 2014, p. 407; Steinerowska-Streb, Wziątek-Staśko, 2016, p. 80), Generation Z seems to be the most problematic in defining its age range, and it is still not so well examined, as it is the youngest generation on the labor market.

Generation Z – age range and characteristic in the literature

Generation Z age range varies considerably. In table 1 examples of different ranges are provided.

It should also be highlighted that another generation follows Generation Z, known as the Alfa gen-

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Table 1. Z Generation age range – literature review

Age range	Author(s)
born 1990 or later	Świerkosz-Hołysz (2016, p. 441); Żarczyńska-Dobiesz and Chomątowska (2014, p. 407); Wiktorowicz and Warwas (2016, p. 22); Wojtaszczyk (2013)
between 1990 and 1999	Half (2015)
between 1991 and 2000	Tulgan (2009, p. 5)
between 1993 and 2012	White (2017)
between 1993 and 2005	Turner (2013, p. 18)
after 1995	Opolska-Bieleńska (2016, p. 37); Ensari (2017, p. 53); Dudek (2017, p. 144)

Source: author's findings.

eration – people born after 2010 (Csobanka, 2016, pp. 66–67, Stunża, 2017, p. 88).

None of previous generations have as many terms as Generation Z, for example: iGeneration, Gen Tech, Online Generation, Post Millennials, Facebook Generation, Switchers, “always clicking”. Generation Z is also known as:

- C Generation – this expression comes from: “connected”, as its representatives are “connected to the internet”; “computerized”; “communicating”; “content-centric”; “community-oriented”, “changing” (as it is said that this generation likes changes) (Świerkosz-Hołysz, 2016, p. 440; Hysa, 2016, p. 389; Dudek, 2017, pp. 144–145),
- R Generation – this expression comes from Responsibility generation (Csobanka, 2016, p. 67).

For a better understanding of Generation Z and its digitization, it should be highlighted that “they were born in the 1990’s and raised in the 2000s during the most profound changes in the century who exists in a world with web, internet, smart phones, laptops, freely available networks and digital media” (Singh, Dangmei, 2016, p. 2). There is an opinion that “this generation is about to spend their youth and adult years in an era of economic and social renewal” (Sidorcuka, Chesnovicka, 2017, p. 809).

Specialists highlight the fact that Generation Z can function in both the real and virtual worlds. They can easily switch between these two worlds, as they perceive them as complementary to one another (Żarczyńska-Dobiesz, Chomątowska, 2014, p. 407). The consequence of this circumstance is that representatives of Generation Z can easily source and check the information they need. They also quickly share information with others. Communication processing among them is continuous, as they use wide variety of communication devices or social media. “The active social media users have many contacts and they mainly live their everyday relations through these channels (personal meetings are also important to them, however, keeping the online contacts have an equally important role)” (Csobanka, 2016, p. 68). Generation Z uses differ-

ent mobile devices, they comment on reality, the environment, and the surroundings they live in, they manifest their opinions and attitudes using Twitter, blogs, and internet forums, and they share photos (Instagram, Pinterest, Snapchat) and films (YouTube, Instagram, Snapchat). Facebook can be used for all of abovementioned activities. Generation Z not only uses the content of the Internet, but they also create and control it (Hardey, 2011, pp. 750–753).

It is emphasized by researchers that “due to applications that support multitasking, being precise or being able to concentrate, memorize something in the long term” has become more difficult for Generation Z (Tari, 2011, after: Csobanka, 2016, p. 69).

The literature on the subject of Generation Z also points to characteristics suggesting that representatives of this generation would like to achieve a spectacular professional career immediately, without any effort. It is difficult for them to face the vision of long lasting professional career development by means of small steps. These are people who look for a job not only in their closest surroundings, but all over the world, as their characteristic features are mobility and knowledge of foreign languages. What constituted a threat for older generations is an object of fascination and experimentation for Generation Z. They do not care about stability at work; they easily change their workplace, looking for versatility and to escape from routine. They are the most educated and sophisticated generation ever (Hysa, 2016, p. 390, Steinerowska-Streb, Wziętek-Staśko, 2016, pp. 81–82). Young people consider self-employment as a way of professional activity, especially because they consider it as better paid and as giving a sense of independence (Pocztowski, Buchelt, Pauli, 2015, p. 19).

On the basis of a literature analysis, Generation Z (probably due to its young age and limited presence on the labor market) is much less frequently described and characterized in professional literature than other generations. This is a generation that (depending on quoted age brackets) has already entered the labor market or is just entering it (having their first job, internship), or is studying and not working yet.

Research methodology and characteristics of the research sample

The research subject is an attempt to obtain answers to the following questions: What kind of generation is Generation Z? How does it characterize itself? Which descriptions existing in professional literature are those that this generation identifies with? Are new technologies really an indispensable element of their lives? Are a fast career and lack of loyalty towards their employers their characteristic features?

To achieve this goal, an inquiry into the professional literature was conducted, which served as a theoretical basis for the empirical analysis. To obtain information from primary sources, empirical research was also conducted. The study was carried out as a survey. A questionnaire was used as the tool for collecting the data (Babbie, 2004, pp. 206–207). It contained closed-ended questions. The research made use of classic tools, including a questionnaire prepared in paper form and (because of the nature of examined respondents) an Internet questionnaire (Andrałojć, 2006, p. 109).

The study was carried out in cooperation with Grupa ATERIMA, a Polish employment agency, delivering recruitment services. The research was conducted between May and July, 2017, in Poland.

1162 respondents took part in the research. The majority of them (72%) were women. The respondents' age group still needs to be described more precisely. Referring to the differences in defining the age brackets for Generation Z described above, the research adopts the widest age brackets; that is, people born in 1990 and later (implying that the sampling was purposive). There are two reasons for this decision. The first one is that the widest definition gives us an opportunity to observe characteristics of people who – because of their age – have already had a few years of job experience, so their opinions may be based on their practical observations and experience. The second reason is that it is possible to compare answers between representatives born in 1990–1995 and after 1995 (as year 1995 seems to be a line in much of the research: Opolska-Bieleńska, 2016, p. 37; Ensari, 2017, p. 53; Dudek, 2017, p. 144) and check if they differ somehow.

One should pay attention to and comment on the activity level of the respondents taking part in this research – they seem to be active in their lives. The vast majority were students (93%) of different fields of studies: economics (79%), humanities (10%), technology (7%), and nature (1%). At the same time, when it comes to professional activity, the biggest percentage of the respondents researched is employed (45%); the second largest works part-time (physical work or work not connected with further professional development – 29%) and unemployed people constitute 26% of the group. It means that as many as 69% of the respondents study and work at the same time.

It should be highlighted that the study findings should not be generalized, as the structure of the research sample is not representative.

Results and discussion

Analyzing the abovementioned professional activity, it may be observed that the first characteristic of research sample of Generation Z is that, despite their young age, they are already professionally active. This may influence their lifestyle and life decisions and make them more independent and mature. It would be an interesting direction for future research: what is the real impact of such an early professional activity and combining study and work – what are the advantages and disadvantages of this situation for them, as well as for their employers.

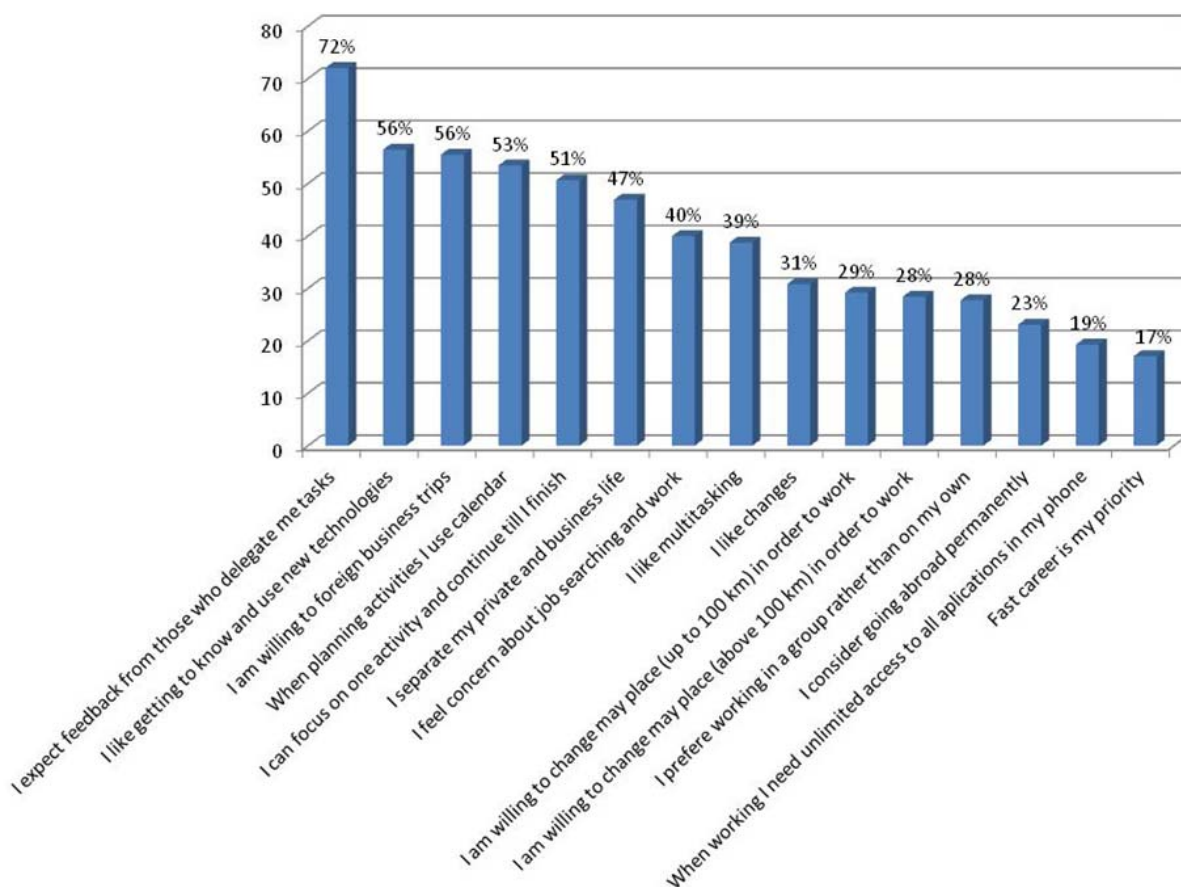
Moving to the crucial part of the research, it should be explained that statements characterizing Generation Z were mostly based on the above quoted literature. Respondents were asked to choose as many characteristics as they identify with out of 15 on the questionnaire.

As the results indicate (figure 1), the most important characteristic of this sample of Generation Z representatives is feedback from someone who delegates tasks to them (72%). It is clearly visible that young people, using the Internet, especially social media, have gotten used to “liking” different things, commenting on reality, evaluating what they buy and use, where they spend time, etc. They have gotten used to expressing themselves. They give feedback, but they also expect feedback and perceive the communication process as bidirectional. There is another important aspect of this particular result. Expectation of feedback seems to be of great value to this generation. Two important characteristics of young people are that they need to learn a lot (as a result of a lack of experience) and that they make mistakes. Openness to feedback is a crucial element of every development process. However, there is an interesting potential direction for further research: how does Generation Z understand feedback? Are they open for developmental areas and constructive, but critical, information?

For more than half of the research sample, new technologies seem to be part of their day-to-day environment – Generation Z representatives like to know and use them (56%). However, this doesn't mean that a majority of them need unlimited access to all the applications on their phone when working (instead only 19% of them do). Generation Z has been characterized as mobile, but according to the results of this research, their mobility is rather doubtful. Although more than a half of the research sample is willing to take foreign business trips (56%), they are not so willing to relocate (up to or above 100 km from their current home) for work (29% and 28%, respectively). On the other hand, 23% are considering moving abroad permanently. It is hard to say whether that is a significant percentage or not. Although it is the minority, if almost a quarter of 27 year-olds and younger people in Poland had suddenly gone abroad, it would be certainly a loss for the country. It should be highlighted that although Generation X was perceived

The Characteristics of Generation Z

Figure 1. Characteristics of Generation Z representatives



Source: author's findings.

as reluctant to move, Generation Y was described as willing to this engage in this kind of change (Smolbik-Jęczmień, 2013a, p. 91). Nevertheless, Polish representatives of Generation Y are less mobile than they are in other countries (e.g., in the rest of Europe and North America) (Smolbik-Jęczmień, 2013b, p. 231). It is possible that Polish members of Generation Z are also not so willing to move.

Generation Z perceives itself as well organized – more than half representatives taking part in this research (53%) declared that, when planning activities, they use calendars and that they can focus on one activity and continue until it is finished (51%).

The fact that 40% of Generation Z representatives feel concern about their job search and their work may come from the abovementioned fact that the childhood of Generation Z was spent during an economic crisis – they could observe people (maybe even parents or other family members) losing their jobs or even their businesses. According to the conducted analysis, respondents who are not professionally active feel more concerned about the job search.

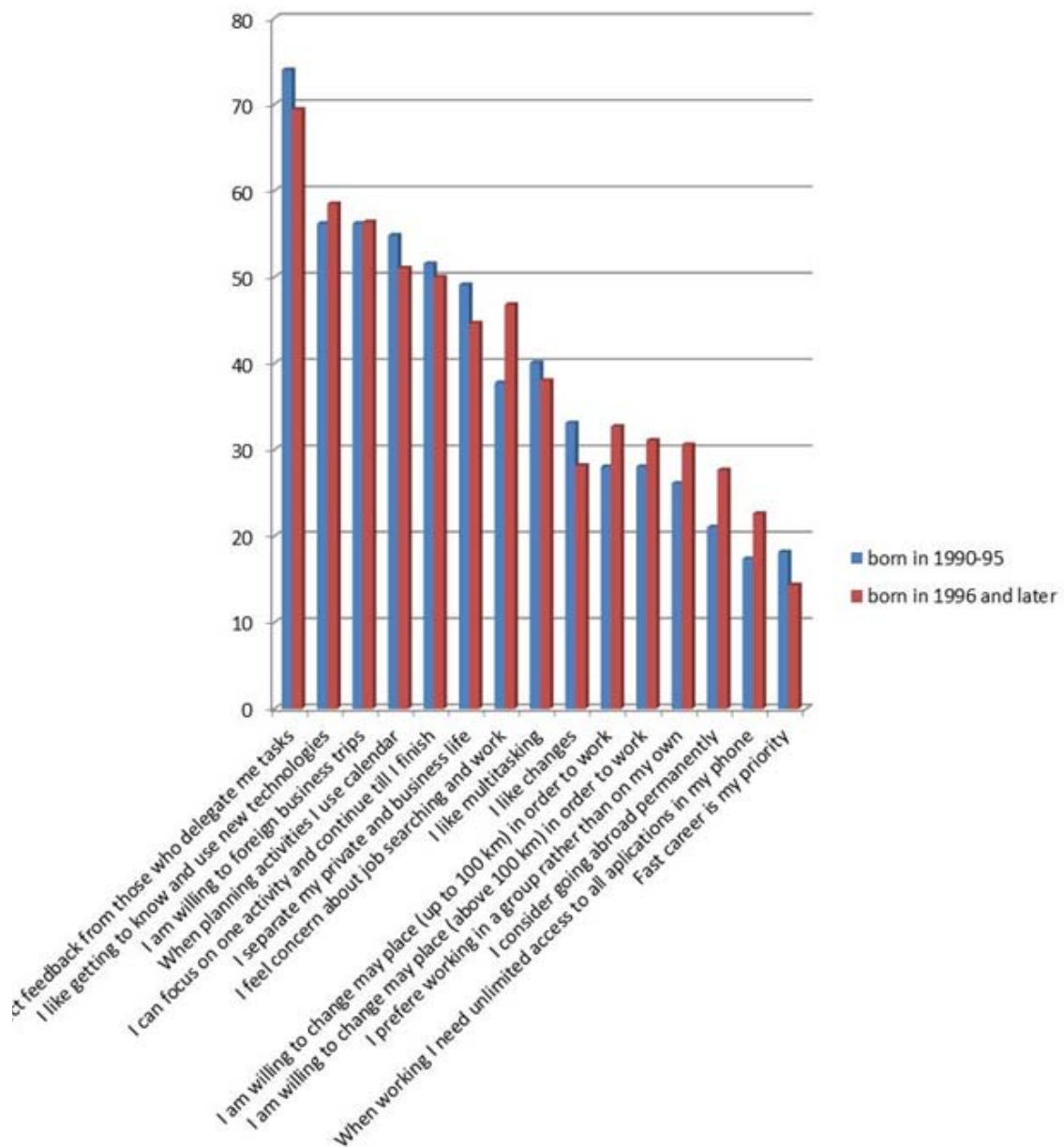
It should be highlighted that Z Generation's priority of having a fast career is a myth. Only 17% of people taking part in this research agree with this statement, and this was the most rarely chosen one. Almost half

of the respondents separate their private and business lives (47%), and only 31% like change – these characteristics may handicap a fast career. The fact that young people live in both the real and digital worlds has already been emphasized. Facebook is the most common social media among young people and is usually used to share information about their private lives (e.g., hobbies, personal activities, free time). This may be the reason that young people are not as focused on their career – they may be more focused on their personal interests. This direction would be an interesting aim of further research.

As there are different ideas about the age range of Generation Z, the abovementioned characteristics were also analyzed in two other age range categories: representatives born between 1990 and 1995 and those born after 1995 (figure 2).

Although there are no big differences between these two age range groups, the results seem to be important. The younger generation seems to be more mobile (in the younger group, willingness to change place in order to work or going abroad permanently is higher). The younger group of respondents more often feels concern about the job search and their work, and they seem to be even more interested in new technologies and having access to them. They

Figure 2. Characteristics of Generation Z representatives in two age range categories: those born between 1990 and 1995 and those born in 1996 or later



Source: author`s findings.

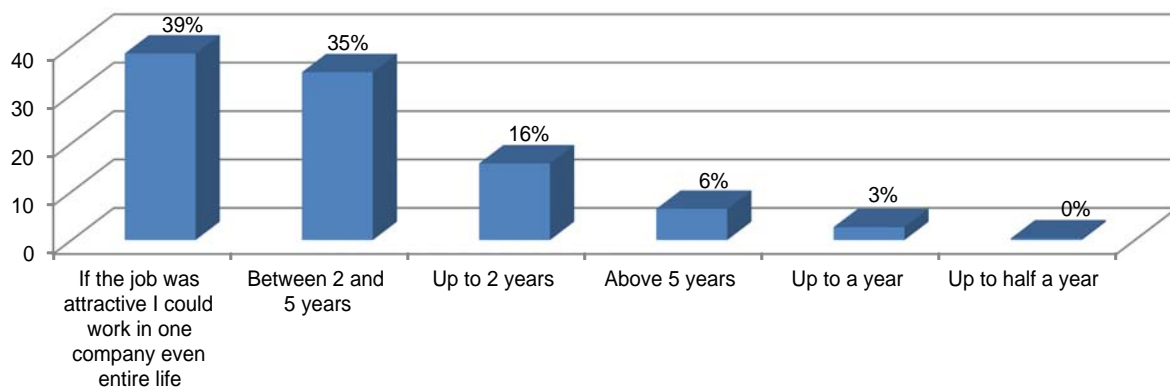
are also more eager to work in a group, rather than on their own. For the older group in the research sample, feedback is even more important. The older group seems to be better organized: they claim that they plan activities using a calendar and can focus on one activity and continue until they finish.

The fact that differences between these two age groups are small means that including people born from 1990 in Generation Z is likely to be justified.

As it is often noted in the literature, people belonging to Generation Z change their jobs frequently, and therefore, the participants of the study were asked to indicate their preferred employment period. The sum-

mary of the answers to this question was unexpectedly different, not only from the commonly expressed opinions about Generation Z, but also from the research presented in the literature. Quite a high number of respondents taking part in this research (39%) claimed that if a job were attractive, they could work in one company for their entire life. It should be highlighted that the way this question was constructed (the only question with an assumption “if the job is attractive”) was deliberate. The aim was to see if the youngest people on the labor market would consider working for one company for their entire life, especially since there are so many opinions about their disloyalty.

Figure 3. The Z generation optimum employment period



Source: author's findings.

It is worth mentioning that the respondents did not get any clues about how to understand the attractiveness of their job, and therefore the answers were based on their intuitive and subjective understanding. This result suggests that it is worth carrying out further research on how Generation Z perceives attractiveness of jobs. The presented results are a part of a broader research in the area of Generation Z. Motivational factors were also an area of interest, but the results of this part of research will be presented in a separate paper in the future. Nevertheless, it seems that in-depth interviews concerning the attractiveness of workplaces would be an interesting direction for further research.

As mentioned in the theoretical part of this paper, there are different (negative) opinions about the youngest people in the labor market. They are considered to be people who cannot concentrate on one thing. The results of this research do not support this observation, but it is also difficult for people to admit to one's own weaknesses. A potential interesting direction of further research (which is planned) is a comparison of the above results to the opinions of the respondents' co-workers, from different generations.

Summary

Although one should never forget that people are different even when they belong to the same age group (Steinerowska-Streb, Wziątek-Staško, 2016), defining people by age range is becoming more and more popular. It probably results from an attempt to understand people whose personality and attitude may be created under different environmental circumstances. Those circumstances are often *signum temporis*, and they do influence people's personality and lifestyles.

In the literature, as well as in business practice, there are different opinions about Generation Z. This research (which cannot be generalized, as the sample is not representative) validates only part of them. It is true that for Generation Z communication is important

– they expect feedback on the results of their work. The research confirms the fact that new technologies are a natural environment for them. Although they are willing to take foreign business trips, they are not so willing to relocate for work. Although it is underlined in the literature that Generation Z is not necessarily loyal to their employers, according to these research results, they are willing to be employed for a longer time by one employer (even for their entire life), but the work needs to be attractive. Surprisingly, for 1162 respondents, having a fast career as a priority is the most rarely chosen characteristic (17%).

It seems that, for successful business cooperation, it is critical to get to know young people and understand them better. Cooperation between the generations is inevitable. Willingness to share knowledge and learn from one another can be advantageous in today's competitive labor market.

Acknowledgments

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Abstract

Generation Z is going to be an important part of human resources within the labor market. As this generation was born and raised under specific conditions different from the other generations in the labor market (e.g., they have always had ubiquitous Internet access), questions arise about the characteristics of the youngest generation – what are they like? The results of this study, based on 1162 representatives of Generation Z (using questionnaires), show that, for the Generation Z, feedback about the results of their work is a crucial element that they most identify with and expect (72%). Additionally, new technologies are a natural environment for them. In the context of their mobility, they willingly go on foreign business trips, but they are not so willing to relocate for work. Although it is said that they easily change their jobs, according to the research results, they would be happy to be employed for a longer period of time by one employer (even their entire life – 39%), but their work needs to be attractive. A fast career as a priority for Generation Z was the most rarely chosen characteristic (only 17% identify with this statement). The research sample is not representative.

Key words: Generation Z, Generation C, feedback, work-mobility, employment period

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Networking activities of general judiciary – from theory to practice

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Over the last three decades, networks – as a field of research – have acquired a significant place among management sciences. Unfortunately, in the judiciary they have become a subject of more careful analyses only recently, which resulted in a large discrepancy of knowledge – both in theory and in its practical adaptation for the needs of the courts. In order to fill this cognitive gap, an attempt was made to identify levels of organizational maturity of common courts in applying a network form of coordination to auxiliary activity. The basis material for the research was provided in 72 interviews with presidents and court heads, and observations of a non-standardized process of information exchange and knowledge sharing within the voluntary court network established during the implementation of the project hosted by the National School of Judiciary and Prosecutor's Office (Krajowa Szkoła Sądownictwa i Prokuratury) Education in time management and court proceedings costs – case management (Edukacja w dziedzinie zarządzania czasem i kosztami postępowań sądowych – case management). 60 regional, district and appeal courts from different appeals cooperated horizontally within the scope of this network. During the project, organizational and management solutions were implemented, such as: improvement of case flow management and efficiency of proceedings, development of effective information policy of courts and management of internal and external communication. As part of the exchange of information and knowledge sharing, the courts used the network form of coordination. The procedure proposed in this article designates five levels of organizational maturity of courts in the implementation of the network form of coordination. The developed procedure can be used to track the progress in the common courts' networking and to inspire the courts to use this form of coordination in practice.

Introduction

Courts count among public sector organizations whose primary form of coordination is hierarchy. Within its framework, communication is conducted vertically, on the line: higher courts (court of appeal,

district court) – lower courts (district court, regional court), and to some extent also on the line: the Ministry of Justice – courts. It is based mainly on control, guidelines or commands rather than cooperation or knowledge sharing. There are no fixed platforms and mechanisms for horizontal cooperation and information exchange between courts of the same level between appeals. This lack causes difficulties in promoting the best management practices, diversification of standards and quality of management, reducing the effectiveness of the judicial authorities.

The work of courts of law may be divided into the so-called adjudication activity (basic) and auxiliary activity, which plays a subservient role in relation to the basic activity. The main aim of the basic activity of the judiciary is to issue fair judgments without unreasonable delay passed by an independent and impartial court. Auxiliary activities are focused on ensuring appropriate technical, organizational and property conditions for the functioning of the court, allowing it to perform tasks related to justice and legal protection (activities subject to the head of the court) as well as ensuring proper internal court proceedings directly related to the performance of tasks referred to above (activities subject to the president of the court).

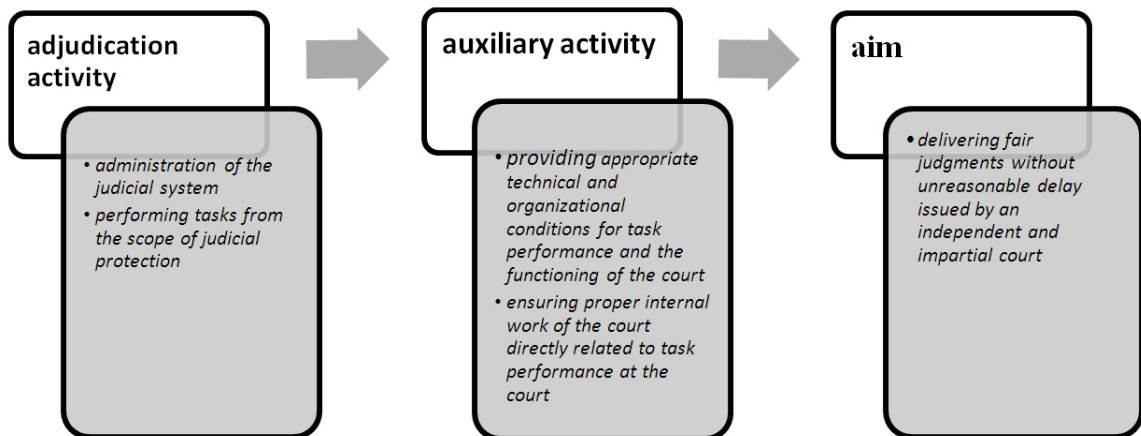
The article attempts to identify the levels of organizational maturity of common courts in implementing the network form of coordination in auxiliary activity. The authors deliberately omitted the issue of network coordination as part of the basic activity, as it is characterized by a specificity resulting from the fact that the basic activity is concerned with administering justice, in which the judges are independent. The exchange of information and knowledge sharing in this area is extremely important, since it can serve to build trust in the justice system by unifying views through consensus as part of different interpretative views. A perfect tool for this sake, serving at the same time as a manifestation of the network management paradigm, may be teams of judges (communities of

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Figure 1. Basic and auxiliary activity of courts



Source: authors' findings.

practitioners) in horizontal arrangements within districts and appeals or between districts and appeals in civil, criminal and economic cases. Network coordination as part of the core business will be discussed in the other article.

In the light of the problem highlighted in the article, attempts have been made to determine the organizational maturity levels of courts of law for the networking forms of coordination, together with the indication of potential benefits for the justice system. The article presents the characteristics of five levels of organizational maturity of courts as units of the judiciary.

A lacuna in theory

Currently, networks are considered a key aspect of social dynamics and the most appropriate form of action of contemporary societies. A common feature of network mechanisms is a reflective self-organization of independent actors involved in complex relationships in the context of mutual interdependence – assuming that such self-organization is based on continuous dialogue and resource sharing aimed at implementing mutually beneficial projects, as well as at solving conflicts and dilemmas inherent in this kind of contacts (Klijn, Koppenjam, 2011, p. 127). Networks as a research area have gained a significant place in management sciences, including also public management. We are witnessing the development of the second generation of research on network management, which focuses on questions that have yet to be answered. These questions concern the future based on networks of coordination linking different levels of management, meta management of self-regulating networks, the role of discourse in relation to network governance, and the problem of democracy and the potential of network governance (Jessop, 1998, 2002; Kickert, Klijn, Koppenjan, 1997; Rhodes, 1997a, 1997 b; Foucault, 1991; Dean, 1999; Rose, 1999; Rose, Miller, 1992; Kooiman, 1993; Mayntz, 1991; Scharpf, 1993, 1994, 1997; March, Olsen, 1995; Powell, DiMag-

gio, 1983, 1991; Scott, 1995; Torfing, 2010). Research within the subdiscipline of public management concerns primarily public administration. The courts and their potential for network coordination have so far remained beyond the interest of researchers, probably because of the mechanism of hierarchical subordination that characterizes judicial organization.

Networks are increasingly seen as a remedy for the malfunction of the state and its administration as well as a way of dealing with market failures. Their advantages and serviceability are thus emphasized, indicating that:

1. they have the potential to anticipate problems and respond flexibly,
2. they are able to aggregate information, knowledge and to interpret it, which enables making rational decisions,
3. they serve to solve conflicts between their participants by offering negotiated, consultative and decision-making procedures,
4. they facilitate making economically rational and socially legitimate decisions,
5. they enable conducting experiments and searching for alternative and innovative solutions,
6. they boost the flexibility of public actions by means of the resources of external partners,
7. they increase the likelihood of public policies being implemented through the involvement of network actors in shaping the objectives of these policies and the methods of achieving them (Klijn, Koppenjam, 2011, p. 129; Mazur, 2015, p. 40).

Courts (as well as other organizations of both private and public sectors) are embedded in a dense structure of ties with their environment (Czakoń, 2007, p. 18; idem, 2012, p. 22), which includes also other courts. Although the legal frameworks for their creation and for their functioning are identical, the courts are characterized by diversity. And it is not only about the differences resulting from the hierarchy – they differ both in their material resources (depending on size) and in non-material resources: knowledge and

skills of employees, but also organizational culture and the ability to learn (Banasik, Brdulak, 2015, p. 33) as well as reputation and a network of contacts (Banasik, Morawska, 2016, p. 428). Courts should strive to unify the services they offer – both in the areas of case-law and administrative law – as opposed to enterprises, where resources together with their key competences serve to build competitive advantages on the market. Courts do not compete by means of products or services for the client; the local characteristics of the court is determined by regulations. Moreover, a citizen has the right to obtain the same quality of service in every court. The common judiciary is based on a hierarchical form of coordination (Banasik, Kuczevska, Morawska, 2018, p. 4), and the architect of this subordination is the legislator who has decided on at least two-stage court proceedings. The number of courts of appeal and, within their frame, district courts (district) as well as of regional courts subordinate to them depends on the second “architect”, i.e. the minister of justice. The common judiciary now consists of eleven appeals. Defining tasks and determining the number and location of courts in legal regulations operates on a principle of stability, and therefore means immutability, petrification, as well as the inability to respond to changing environment, and consequently may cause regulatory dysfunction.

A counterbalance to the hierarchy may be voluntary court networks, oriented to the creation, acquisition, dissemination and use of knowledge, and the implementation of mutual learning processes and processes of commercialization of knowledge and information - i.e. innovation networks. We can follow the antecedents for the innovation network in common courts by referring to the multicentricity of the law. A departure from a hierarchically ordered and monocentric model of the legal sources system, which can be depicted as a pyramid or a ladder has recently been observed. The network architecture is possible both in a vertical system (court – interested party), as well as in a horizontal system (court – court or court – law corporations). In a horizontal

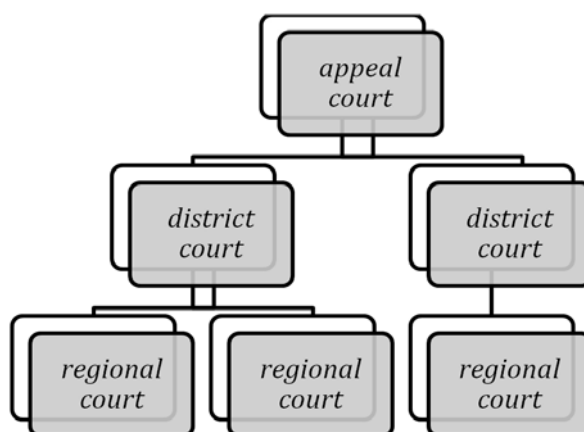
configuration, homogeneous networks (court – court) or heterogeneous networks (court – law corporations) are possible. The task of heterogeneous horizontal networks should be to search for innovative solutions among organizations that are close to organizational law courts, while their adaptation to the needs of courts could take place within horizontal homogeneous networks. The study of social expectations and anticipatory identification of problems, as well as flexible response to them, would be implemented as part of heterogeneous vertical networks.

Research Methodology

In order to identify the levels of organizational maturity of the network forms of coordination:

1. The research problem, subject matter and scope of the research (preliminary stage) were determined and literature studies were conducted, involving analysis of source documentation, historical materials and reports made available by the National School of Judiciary and Public Prosecutor's Office (Krajowa Szkoła Sądownictwa i Prokuratury), Ministry of Justice of the Republic of Poland and studies prepared by international organizations.
2. Interviews with respondents were carried out from November 2015 to March 31, 2016 (72 free interviews with presidents and court heads). In a free interview, sometimes also called an in-depth ethnographic interview, the interviewer is free to arrange the sequence of questions, and the way they are formulated depending on the circumstances of the interview. The interview was conducted on the basis of a questionnaire standardized in a greater degree.
3. Investigations were made into a non-standardized process of information exchange and knowledge sharing through voluntary court networks between pilot courts during the implementation of good managerial and organizational practices.

Figure 2. Hierarchy in Common Courts



Source: authors' findings.

Analysis of the results of a pilot consulting project on the implementation of modern methods of common courts management, carried out in 2011–2015 as *PWP Edukacja w dziedzinie zarządzania czasem i kosztami postępowań – case management (Education in the field of time management and costs of proceedings – case management Project POKL 05.03.00-00-012/1)*, became an inspiration to enhance the study of network coordination in common courts.¹ As part of a pilot project in sixty selected common courts (district, regional and appeal courts), with the support of external experts, a project “good practices” was implemented,² which proposed management improvements in the areas of communication, human resources management and the use of modern technologies to monitor the flow of cases through the court and finances. External experts, in cooperation with the presidents and directors of the pilot courts, were identifying process, organizational and social innovations, describing them and then implementing them in all pilot courts. The pilot was complemented by workshops supporting the implementation of the “good practices” in the area of improving the service of the client, managing the flow of cases and workload in the department, the use of modern technologies in the justice system, work organization in the judge’s caseload, human resources management and court finances as well as modern leadership in the judicial systems. As part of the pilot, communities of practitioners, consisting of presidents and heads of the pilot courts, were also established.³ Presidents and directors met regularly and voluntarily to develop management solutions that would be optimal from the point of view of the organization of justice. These meetings constituted a sort of a platform for vertical and horizontal exchange of ideas and experiences. Participation of decision-makers in the communities of practitioners guaranteed a practical implementation of the developed solutions. As a result of the pilot, a network of pilot courts was established. As part of the pilot project, a discussion forum was cre-

ated, which served the project participants as means of exchanging views and experiences. It provided easy and quick access to compiled knowledge. The analysis of the results of research conducted in pilot courts indicated that there existed a considerable potential in the judiciary for creating voluntary court networks. Their main goal would be to connect its members, facilitate common activities and learning, and, in consequence, to create new solutions to existing problems. The research shows that judicial cooperation neglecting the existing hierarchical subordination is possible (Banasik, Morawska, 2016, p. 430). The multi-entity character and complexity of the organizations under investigation causes many difficulties, not only when analyzing the functioning of emerging networks, but above all, in defining them as a subject of research that can be examined, measured and systematized.

Networks created as a result of project implementation:

1. are voluntary (network members remain independent and interact only when needed; the links between them are loose and sporadic; these networks assume a loose form of cooperation and their primary purpose is knowledge sharing),
2. do not have a separate management unit, organizations make decisions on equal terms,
3. they are at an initial stage of development, in which relationships are built, standards set, and directions of action determined. It is difficult to talk about a high degree of trust, links with other networks or strong relationships (Banasik, Morawska, 2015, pp. 35–57; Banasik, Morawska, 2016, pp. 421–436).

It can also be assumed that as a result of the project, the concept of network in the surveyed entities is used as the basis for introducing innovations and new ways of managing complex interactions (Brzóska, 2014, p. 46).

¹ A more general description and results of the research in the field of the potential of common courts in the implementation of the network coordination form are presented in the publication: Banasik, P., Morawska, S. (2015), *Zarządzanie (współzarządzanie) sieciowe i zarządzanie sieciami w wymiarze sprawiedliwości – wyzwania*, *Studia i Materiały. Wydział Zarządzania Uniwersytetu Warszawskiego*, pp. 98–112.

² The following “good practices” were implemented as part of the pilot: 1. Managing the tasks of court referendaries, 2. Managing changes in employees’ attitudes, 3. Electronic ordering, 4. IT tools for internal communication, 5. Managing court records in digital form, 6. Analysis of activities in the case law, 7. Management of employee knowledge and competences, 8. Non-financial instruments of motivation, 9. Standardization of workstations, 10. Examination of satisfaction of court employees, 11. Staff audit, 12. Participatory model of court management, 13. Management of employee innovation, 14. Improvement of the case law support system, 15. Management of recruitment and adaptation of employees, 16. Organization and functioning of the Customer Service Office, 17. IT system of resource reservation, 18. Management of the system of periodic employee evaluation, 19. Audit of computer security, 20. Management of IT resources and services, 21. Improvement of the court image, 22. Court in the social environment, 23. Organization of accounting in the environment of new technologies, 24. Court as a self-learning organization.

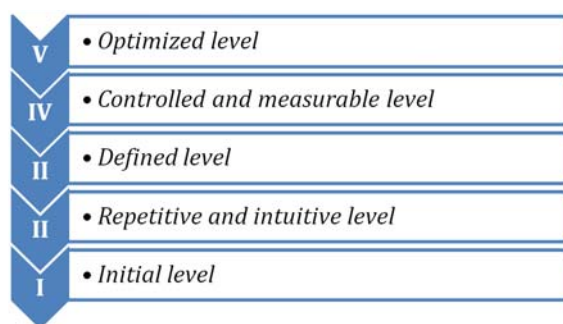
³ A community of practitioners is defined as “a group of people who share interest in a specific area and who increase their knowledge about it through permanent, regular interaction. A community of practitioners can be treated as a platform for both formal and informal communication based on the involvement of all participants and focused on increasing their knowledge.

Discussion of the obtained results – levels of organizational maturity for networking observed at courts

The conducted research enabled to identify five levels of organizational maturity of courts. The level system is shown in figure 3.

Table 1 presents a description of individual levels of court maturity for network coordination observed in the courts participating in the project.

Figure 3. Levels of organizational maturity of courts



Source: authors' findings.

Table 1. Description of the levels of court maturity for the practice of *Networking in the common court*

Maturity level	Characteristics
I <i>Initial level</i>	<ul style="list-style-type: none"> – In the last 24 months, no inter-organizational cooperation (relationship) has been established with other courts, going beyond formal business relationships between courts; – in the last 24 months no inter-organizational cooperation has been established with other organizations in the field of justice (prosecutors, notaries, lawyers, legal advisers, universities, non-governmental organizations); – in the last 24 months, within the framework of hierarchical networks, employees did not participate in thematic networks (communities of practitioners). – In the last 24 months, irregular meetings of presidents or court heads in appeals or districts were held within hierarchical networks.
II <i>Repetitive and intuitive level</i>	<ul style="list-style-type: none"> – In the last 24 months, inter-organizational cooperation with other courts has been established, going beyond formal business relationships between courts in the area of appeal; – within the last 24 months, inter-organizational cooperation was established with other organizations of the area of justice (prosecutors, notaries, lawyers, legal advisers, universities, non-governmental organizations) as part of bilateral contacts; – cooperation within the network is irregular; – in the last 24 months, within the framework of regulatory networks, court employees participated irregularly in thematic networks (communities of practitioners), the court was an absorber of knowledge in the framework of inter-organizational cooperation; – In the last 24 months, irregular court meetings of presidents or court directors within a district or appeal were held within hierarchical networks.
III <i>Defined level</i>	<ul style="list-style-type: none"> – In the last 24 months, inter-organizational cooperation with other courts has been established in the court, going beyond formal business relationships between courts in the area of appeal; – in the last 24 months, inter-organizational cooperation was established with other courts going beyond formal business relationships between courts of various appeals; – in the last 24 months, inter-organizational cooperation was established with other organizations of the field of justice (prosecutors, notaries, lawyers, legal advisers, universities, non-governmental organizations); – cooperation within the network is irregular; – in court in the last 24 months as part of hierarchical networks, court employees participated in thematic networks (communities of practitioners), the court was an absorber of knowledge in the framework of inter-organizational cooperation; – in court in the last 24 months, monthly meetings of court presidents in the districts and appeals were held as part of hierarchical networks.

Table 1 – cont.

Maturity level	Characteristics
<p style="text-align: center;">IV <i>Controlled and measurable level</i></p>	<ul style="list-style-type: none"> – In the last 24 months, in the court, inter-organizational cooperation was established with other courts, going beyond formal business relationships between courts in the area of appeal; – in the last 24 months, inter-organizational cooperation with other courts was established, going beyond formal business relationships between courts of various appeals; – in the last 24 months cooperation within the court has been established as part of cooperation with other organizations in the field of justice (prosecutors, notaries, lawyers, legal advisers, universities, non-governmental organizations); – cooperation within the network is regular – network actors (their representatives) meet once a month; – in the last 24 months court employees have regularly participated in thematic networks (communities of practitioners), as part of hierarchical or cooperative networks; – the court was an absorbent and transformer within the framework of inter-organizational cooperation; – in court in the last 24 months, monthly meetings of court presidents in districts and appeals were held as part of hierarchical networks.
<p style="text-align: center;">V <i>Optimized level</i></p>	<ul style="list-style-type: none"> – In the last 24 months, the court has become an integrator of inter-organizational cooperation; – in the last 24 months, inter-organizational cooperation was established with other courts going beyond formal business relationships between courts in the area of appeal; – in the last 24 months, inter-organizational cooperation with other courts was established, going beyond formal business relationships between courts from various appeals; – in the last 24 months cooperation within the court has been established as part of cooperation with other organizations in the field of justice (prosecutors, notaries, lawyers, legal advisers, universities, non-governmental organizations); – cooperation within the network is regular – network actors (their representatives) meet regularly within the set calendar of meetings, knowledge transfer takes place via an online platform; – in the last 24 months court employees have regularly participated in thematic networks (practitioners’ communities) as part of hierarchical or cooperative networks; – the court was an absorber, transformer and creator of knowledge within inter-organizational cooperation; – in court in the last 24 months, regular meetings of presidents or court heads in districts and appeals have taken place within hierarchical networks.

Source: authors’ findings.

General recommendations for networking in the judiciary

The “networked” structure is above all a great challenge to making independent decisions and taking responsibility for one’s own actions. In this case, it is not a full control, but an appropriate management style and appropriate tools that support employees and give them space to engage team members in the functioning of the organization, as well as the development of intra-organizational activities, that is, the ability to see the needs, generate and improve ideas as well as the ability to use opportunities and take risks.

Unification of activities within the framework of auxiliary activities of courts in districts and appeals (using the practice developed in the study) would foster increasing trust in the justice system, while appointing groups trained and responsible for activities in this area could contribute to actions aimed at quality management. Collaboration in teams would also have a positive impact on relationships, and in connection with closer cooperation and knowledge sharing – perhaps also on the quality of case law. The effectiveness and efficiency of the network depends on the work of all its elements, so it is important to have a fast flow of information and materials within the existing network (Odlanicka-Poczobutt, 2016, p. 45).

Basic recommendations for the network practice form of coordinating cooperation in courts:

1. development of tools for active search for the best solutions in the dynamic transfer of knowledge between all network participants at all its levels, which in turn is expected to result in the increase of applicability, including more effective acquisition of knowledge, its unification and consensus between different interpretative views;
2. development of tools for knowledge transfer and creation of a database available to members of the network;
3. developing a model of horizontal and vertical organizational cooperation between district, regional and appeal courts as well as between courts and external stakeholders of the judiciary;
4. improving the efficiency of information and knowledge exchange;
5. creating a set of tools supporting the development of inter-organizational cooperation and enabling the use of information, knowledge, skills, competences and motivation to improve and perfect courts – project management, stakeholder analysis, benchmarking, outsourcing, mentoring, coaching, strategic scorecard and kaizen;
6. presentation of management concepts that support the development of inter-organizational cooperation: project management, innovation management, knowledge management, human capital management, strategic management, process management, change management and value management.

Potential benefits that could be acquired are:

1. joining the courts, facilitating joint activities and learning, and consequently creating new solutions for existing problems;
2. evolution of the court towards an open organization involving stakeholders of the judiciary in solving specific problems (implementing the concept of crowdsourcing – drawing ideas from judiciary stakeholders);
3. use of intellectual resources, existing outside the court, to carry out innovative changes in the processes and manners of its functioning;
4. building social capital through the development of communication with all judiciary stakeholders;
5. expansion of networking in the judiciary – transfer of “good practices”;
6. promoting the court as a knowledge-based organization that uses networks for internal and inter-organizational learning;
7. supporting the image-building activity of the court – moving away from the image of a bureaucratic-oppressive institution towards an institution of social trust;
8. support of court information activities;
9. inclusion of other entities in the construction of a judicial area on partnership principals;

10. activating court employees and enhancing their competences.

Conclusions

Creating modern, flexible solutions in place of hierarchical structures gives organizations the opportunity to more efficiently obtain resources, reduce costs and increase operational excellence. It also enables more effective learning, and helps to avoid barriers, reduce risks and limit uncertainty. It is worth noting that all these factors translate into the speed of action, i.e. the shortest possible response time of the organization to change occurring in its environment. This is the greatest advantage of the network. The courts are an interesting research object; they create open systems, where organizations are not atomized, and constitute an element of a constantly expanding complex network in which processes of value delivery to various stakeholders are implemented. At the same time, the environment of courts as judicial units is not nameless, and thanks to the relationships of various entities inside voluntary networks – it can be perfected. The results of the research indicate that it is possible to use the network form of coordination in courts – even though hierarchical subordination forms the organizational basis, and communication is mainly based on controls, guidelines and instructions. Cooperation within the network can contribute to the organizational efficiency of public judiciary through a rational use of resources and harmonious cooperation of all organizational elements. The practice of network coordination in common courts can contribute to the use of this form of coordination and help in assessing the level of court maturity on the way to networking.

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Abstract

The development of the concept of the network, which is used both to explain complex decisions made in the area of implemented policy and as a basis for introducing innovations, is currently of significant importance for organizations. The analysis of network relations may contribute to increasing the efficiency of managing complex interactions that also arise in the sphere of entities participating in activities aimed at satisfying social needs, which is why the common courts that constitute the system of justice is the subject of interest.

The purpose of this article was to determine the levels of organizational maturity of common courts for the practice of cross-referencing within the justice system, the formulation of general recommendations in this area, and indication of potential benefits. The research involved direct interviews and participant observations as a result of the project POKL 05.03.00-00-012/11, entitled PWP Education in the field of time management and court proceedings costs – Case management. Nearly 10% of all courts in Poland were subject to the survey. The research results became the basis for determining the levels of organizational maturity of the courts.

The results obtained indicate the potential for the judiciary to create horizontal organizational links, the purpose of which is to connect members of the organization, facilitate joint activities and learning, and consequently create new solutions to existing problems. The research shows that the level of maturity is varied, but judicial cooperation is possible, cutting hierarchical subordination as a voluntary inter-organizational network.

Keywords: network, networking, justice, common courts, levels of organization maturity

Networking activities of general judiciary...

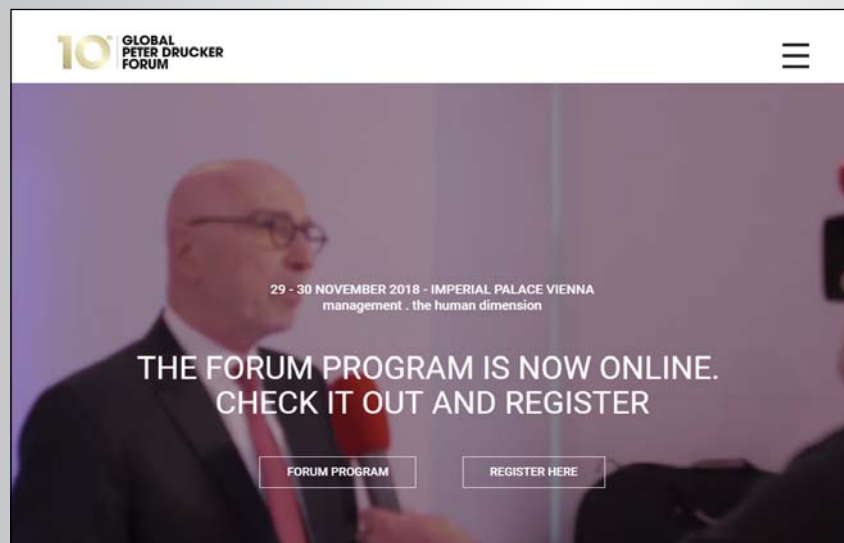
Przemysław Banasik is a Doctor (Hab.) of Economic Sciences, an Associate Professor at the Gdańsk University of Technology, and a judge at a court of appeal. He is a participant in grants and statutory research, possesses a wide knowledge of court rules in the basic area (case law) and experience in court management obtained while holding the position of president at the first District Court in Wejherowo, and then at the District Court in Gdańsk; author of the good practice “The Court in the Social Environment”, implemented in 60 common courts; participant of the international project “Education in the field of time and cost management of court proceedings – case management” (“Edukacja w dziedzinie zarządzania czasem i kosztami postępowań sądowych – case management”).

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“What would robots do if humans took over?” The joky question posed by Shagun Tripathi at the Global Peter Drucker Forum 2018 raises a fundamental issue. It prompts us to remember that the economy, technology, business and government are not givens – they are shaped by human choice. Yet it also forces us to recognize that the human perspective has been increasingly sidelined in the way we think about and enact the relations between technology and society, leaving the most precious, human, potential undervalued and underused. “Taking over” means actively

shaping the organizations of the future and taking on a different mind-set: Should leaders in the 21st century become as good in understanding the human dimension as they are in grasping the latest scientific discovery, technology or management technique? Should they be able to frame challenges differently and ask different questions? At best, should we more actively manage the creation of our own future?

More information: <https://www.druckerforum.org/2018/home/>

Innovation and experiments at OLC Innovate 2018

Maria Zajac*

This year, in April, I participated for the first time at the OLC Innovate Conference which took place in Nashville, TN. Why for the first time? Mainly because of the geographical distance. From Krakow (Poland), where I live, to Nashville it is 8039 km (4995 miles), and the distance is similar to other OLC conference locations in the US, which makes such experiences very expensive and hardly affordable. As an academic actively involved for many years in online education in Poland, and the editor-in-chief of an academic journal aimed, among other things, at e-learning and technology enhanced learning, I was really thrilled when I received a free press pass for virtual attendance at the OLC Innovate conference.

Virtual attendance has its pros and cons. You do not need to travel and to overcome jet lag after a long boring flight, but on the other hand you have to rearrange your daily duties to be able to participate in live sessions, which is not always easy. The other important drawback is that virtual participation will never give you the same opportunity to make new contacts, to interact with others and to feel the atmosphere of the gathering in the same way as face-to-face attendance. However, it should be stressed that the organizers put in a lot of effort to help virtual participants to get involved in the event.

Brief Characteristics – tracks and sessions

First of all, the variety of sessions must be emphasized. As one can read in the conference program, the volume of numerous education sessions was extended by *emerging ideas meetings, workshops, innovation labs, the Solution Design Summit and Career Forum Roundtables*. The organizers also included a couple of less formal gatherings, like: *Conversations – Not Presentations* (to foster slide-free discussion and dialogue) and *Campfire Stories*. The number of tracks was also impressive: *Teaching and Learning Innovation; Leadership and Change Management; The Education-Workforce Continuum; Processes, Problems, and Practices; Effective Tools, Toys and Technologies* as well as *Research Highlights and Innovations*. The scope was broad and presumably everyone could find something interesting and new.

A reasonable number of sessions was also available for virtual attendance, either as streamed sessions, YouTube recordings or short on-the-spot reports via the zoom.us app that allowed the virtual participants to “walk around” and watch what was happening at chosen places and booths. They could even ask questions and get a response from the presenters or hosts of those booths. In general, it must be stressed that live online interaction with the presenters or the invited guests was granted, and several social channels like Twitter, Slack and Facebook were available.

Innovation at different levels

This short overview is not intended to be complete, but I would like to point out three different examples of innovation on three different levels. The first one refers to the institutional or even system change that is likely to happen in the near future. The second reflects a significant shift in learning assessment, and last but not least is the holistic approach to the use of technology at HE institutions.

The first was presented by Barbara Bichelmeyer (University of Missouri – Kansas City). There were two elements in her presentation that I would like to recall here. The first one was the necessity to redefine some basic concepts of higher education, including education itself. Other concepts that Barbara mentioned are: expertise, the role of the degree, and interactivity collocated with students’ engagement. The background for these changes is the internet, which “is breaking the old paradigm of education as information dissemination” by “bringing the truth into our collective consciousness that the purpose of education is not, information dissemination, but rather it is human capacity-building”. In consequence – according to the presenter – the internet leads to the significant disaggregation of the university infrastructure in at least five ways:

- disaggregation of teaching from certification,
- disaggregation of the elements of instruction,
- disaggregation of instructional responsibilities,

* E-mentor Academic Journal – Warsaw School of Economics

- disaggregation of faculty roles,
- disaggregation of educational services.

At OLC Innovate 2018 there were quite a few presentations linked to assessment, but here I would like to refer to one of the OLC Live meetings in which Dave Goodrich talked to Erik Skogsberg about the idea of “ungraded assessment” commonly referred to as “narrative evaluation”. Erik recalled his experience at the university college that he had chosen because of the approach to assessment they applied, with no letter grades but with the narrative twofold evaluation instead. The first part was student self-evaluation while the second one was the teacher’s feedback and description of how well the student was doing throughout a project, a course or a semester. For some courses these descriptive evaluations replaced the traditional transcripts creating a sort of a portfolio. The idea itself is not really new, but the point is that not giving grades is one of the ways of passing the responsibility and agency for learning to the learner. And sometimes it may constitute a real obstacle, as was mentioned in John Stewart’s interview with Ken Bauer, a Canadian who teaches at the University of Guadalajara in Mexico. While talking about introducing the flipped classroom model at the university, he stressed that sometimes the students’ resistance originating from the way they were taught at school is even more difficult to overcome than that of the teachers. And in his opinion the main reason for that was the responsibility for their own learning that the students must take over.

The use of ICT in education has its proponents and opponents and will not be under discussion here, but it cannot be denied that the positive impact it may have depends heavily on the way technology is being used, and for what purpose. At OLC Innovate 2018 a very interesting overview of technology-based tools was delivered by Amy Homkes-Hayes from the University of Michigan Office of Academic Innovation. Her presentation *Growing Digital Pedagogy in The Digital Innovation Greenhouse at the University of Michigan* provided a whole bunch of apps created by the staff of DI hub and aimed at different tasks. A stunning feature of that offer is the holistic approach to the needs of the learner, who is in the center of attention. As declared during the session, “the technology is used to put data in learners’ hands. This supports decision making, triggers personal connections, motivates action, and guides behavior change”. The following list of apps derived from the conference presentation illustrates what was meant by that statement:

1. ART 2.0 – Academic Reporting Tools: academic data to help make choices;
2. ECoach – personalized messaging for students: getting the right message to the right person at the right time in the right way;
3. GradeCraft – Gameful Pedagogy for Learning: gameful course design is a pedagogical approach that leverages inspiration from well-designed games to create engaging learning environments;

4. Healthy Minds – a web-based survey for colleges and universities to assess the mental health landscape and mental health service use/usefulness at their schools;
5. M-Write – a tool that supports writing in large-enrollment courses by creating corpora of students writing for text analysis, which on the one hand will be automated and on the other will provide actionable information to students and instructors;
6. Online Learning Tools like:
 - a) multimeasure (visualization tool),
 - b) problem roulette (low risk practice problems for exam prep and topic mastery),
 - c) viewpoint (engaged and interactive role-playing simulations),
 - d) wireless indoor location device (a unique platform for kinesthetic learning).

Active participation and engagement

Apart from the social channels already mentioned, there was a variety of other activities that supported making new contacts and exchanging ideas. The names of some of them sound a bit exotic and at the same time intriguing in the conference context, at least from the European perspective: Star Search, Swap-and-Meet or Evening Campfire Gatherings.

Those who volunteered to participate in the Star Search were expected to “serve as documentarians and citizen journalists, taking notes (in any format desired) on the sessions and events that they attend during the conference. The shared spaces where notes were captured was available to conference attendees to see and contribute”. The findings were to be presented during the Closing Ceremony on Friday, April 20. Virtual attendance did not allow for active participation in such search, therefore I can only imagine how exciting this experience was.

Swap-and-Meet. In this term borrowed from the scouts’, both words “meet” and “swap” are important. You meet someone, you talk and exchange little gifts or gadgets, which are the type of currency in this barter. The reason the organizers of OLC adopted this concept was “to encourage people to make contacts, to show appreciation or just give anyone a little gift”. Participants could have prepared the swaps before the conference – at home or in the makerspace they belong to – but the organizers also provided stands with materials for those willing to do something on the spot. Some ideas about what such swaps could look like can be found on Twitter using the #OLC-swapmeet hashtag.

While those two types of engagement were inaccessible to virtual participants, some Campfire Gatherings have been recorded and made available via the OLC Virtual Hub. The idea behind those meetings was the same as with the other forms of activity during the OLC Innovate – just give the participants another occasion to share common interests and experience – but in an informal context. To initiate the conversations some

keynote speakers were invited and asked to present (in any form) during the 5-minute time slot some inspiring or thought-provoking ideas based on their teaching or learning experience. Sometimes the title of the presentation did not reveal the real subject, as was the case with the following two: *On being awake* (delivered by Shel Kimen) and *Pathways and possibilities* (presented by Melody Buckner). The first speaker pointed out two issues – risk and failure – and asked the audience to choose whether they preferred listening or watching. As the last was chosen, she started to dance around the “campfire” and invited others to join her. For a few minutes there was a common dance and joy. In this unconventional way Shel presented risk, and at the end of the dance she confessed that she was terrified. The presentation was well received and followed by applause.

Melody’s talk about educational aspects of losing one’s life in a virtual game was similarly unusual and surprising. She recalled the explanation her teenage son gave her when she was frustrated by such a loss: “Why are you angry? You have just learned something new, and in the next play you will act differently.”

What I liked and what was new to me

Generally, I am not a real fan of virtual attendance at a conference. Although it does have some obvious advantages, the main drawback in my opinion is the limited contact with other participants and no possibility to immerse yourself in the atmosphere of the

gathering. However, in the case of OLC Innovate 2018 its organizers put in a lot of effort to diminish those hurdles, not only by streaming chosen sessions but mainly by creating so many versatile possibilities for immersion in the event and by engaging people in sharing their experience.

As a virtual participant I really appreciated the possibility of listening to live talks, being part of OLC Live, and the many other forms of reporting what was going on in Nashville during those days. I was really impressed by the fact that there were so many informal occasions to “meet” and to listen to the presenters and other people actively involved in the conference. However, I could not experience the real atmosphere of that great gathering and I really missed it. The main reason for attending a conference is meeting others and finding what we have in common, or sharing our passions and interests. And although the organizers provided various opportunities to connect via social media channels, it is not the same. But when you watch a live informal conversation with the keynote speaker or the yoga instructor or the program co-chair, you can feel a bit like “being there”. Thanks for all those OLC Live talks – that was a great idea.

And finally, one other factor has to be mentioned: if a person does not attend the conference on site but gets access to the recordings, it is highly likely that they will return to them and learn more by listening at their own pace, as I did. I have learned a lot by watching OLC Live Virtual Hub and Zoom Rooms.

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International project-oriented training of engineers based on the example of the European Engineering Team



Bartłomiej
Gładysz*



Elżbieta
Jarzębowska*

The authors present their analysis, from the viewpoint of competence development and achievement of learning outcomes, of the first round of the innovative teaching program "European Engineering Team", which was implemented within the framework of the ERASMUS+ initiative. The innovativeness of the program lies in its orientation to engineering projects, which the technical university master course curriculum is enriched with, and the cooperation of four European technical universities. The students independently select and specify engineering problems related to sustainable development. The formula of the program changes the traditional approach to mobility known from other ERASMUS+ activities. During its implementation the students participated in four international meetings, consultations, web conferences and teleconferences, which is in line with the current trends of the global labor market. Between the direct meetings, they have cooperated with each other remotely, simultaneously participating in the regular courses at their home technical universities. The aim of the project was to verify the effectiveness of the proposed approach towards inter-institutional initiatives using blended teaching methods. This approach is aimed at developing competences in the area of defining engineering problems within the framework of sustainable development, the cooperation in international and geographically dispersed teams and working in interdisciplinary projects while utilizing the knowledge from many disciplines. The approach proved to be effective and the students' competences in the assumed areas have increased significantly. At the same time, the experience gained has allowed to identify the areas in which learning outcomes can be increased and the focus will be placed on them in the next round of the program.

Traditional methods of educating engineers are considered to be insufficient in relation to the contemporary requirements (MacLeod, 2010, pp. 21-34). Engineers should be prepared to work in a global environment which is characterized by high volatility, multiculturalism and new social, economic and environmental trends resulting, among others, from globalization. Such a dynamic environment of engi-

neering activity is reflected in the European Union's EUROPE 2020 strategy (EC, 2010, p. 11). This strategy emphasizes the importance of economic growth, job creation, climate change, prosperity and social security. Vernon (2000, pp. 215–225) shows that an effective training of engineers should be focused on the student, oriented to designing tasks and contain the elements of economics and management. There are many initiatives related to the new forms of cooperation between universities (Paci et al., 2013, pp. 487–493), including the education of engineers. One of such forms are the so-called "learning factories", which allow one to acquire the competences necessary for the transfer of technology from the world of science to industry (Ziemian and Sharma, 2007, pp. 199–210). Unfortunately, this approach to education does not include the initial stages of development of innovation. Another well-known approach is the experiential learning (EL) developed in the works of Dewey (2007, pp. 17–97), Lewin (Schein, 1996, pp. 27–47), Piaget (1964, pp. 7–20), or Kolb (2015, pp. 1–354; Kolb and Kolb, 2005, pp. 193–212). Jack et al. (2011, pp. 75–76) indicate that in order to ensure high quality and effectiveness of education of engineers it is necessary to engage students in global travels and projects, including subjects related to global aspects of manufacturing, and in particular the use teaching methods that increase students' involvement.

International project-based training of engineers

Only a few training initiatives for engineers offer transnational and project-based curricula. What they lack is the parallel use of virtual and direct collaboration between students. The initiatives focused on virtual collaboration include:

- an interactive online course based on an internet platform between an American and a German university (May, Wold and Moore, 2014, pp. 12–19),

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- international, interdisciplinary, project-oriented studies in the cooperation with the industry (Flores et al., 2012, pp. 70–74),
- an intercollegiate (5 universities from Romania, Moldova and Croatia) course in education in a foreign language, French (Petrea and Velescu, 2014, pp. 707–711),
- an intercollegiate (3 universities from the USA) project in the field of software engineering (Kurtz et al., 2007, pp. 464–468),
- an intercollegiate (Canadian and Finnish university) course in software engineering (Paasivaara et al., 2013, pp. 1128–1137).

In turn, didactic initiative focused on direct cooperation characterized by short periods of work performed in a specific place are:

- Portuguese-German project on climate change (Sanderson, 2017, pp. 63–65),
- an international, interdisciplinary course for engineers from TU Berlin (Oladiran et al., 2011, pp. 173–186),
- a 28-week international (students from France, Germany, Ireland, Great Britain) course in the field of construction management (Lane, 1994, pp. 443–448).

Most didactic initiatives do not combine virtual and direct cooperation, and such cooperation is characteristic of the modern market. There are also no initiatives combining the guidelines presented by Vernon (2000, pp. 215–225) and Jack et al. (2011, pp. 75–76), whose main focus is to incorporate the assumptions of gaining education through experience for engineers with emphasis on the importance of sustainable development, systems engineering and development of new products. Such initiatives should also eliminate the barriers defined by Sharma et al. (2017, pp. 4032–4040), problems associated with work in multidisciplinary teams, organizational problems and limited involvement of students.

Assumptions of the “European Engineering Team” program

Framework of the program

The intention of the “European Engineering Team” (EET) is to eliminate these deficiencies in the didactic process of engineers by creating an inter-university, project-oriented program and with the use of blended learning (Bonk and Graham, 2006, p. 1), i.e. combination of traditional and long-distance learning in international and interdisciplinary environments, which was developed and implemented at the master studies at 4 European technical universities. The EET is a unique program based on EL principles and which uses a holistic approach, which includes management, broadly understood mechanics and production engineering. Its priority is the principle of sustainable development applied to innovative engineering solutions.

The idea of the EET is shown in figure 1. The entire program of the course is implemented in a rotational model of blended learning (Beaver et al., 2014, p. 7), in which the periods of work and long-distance learning are interwoven with periods of work with a teacher. The EET course consists of four one-week periods of the direct cooperation. The meetings are held in each of the technical universities participating in the project. Between the meetings, a virtual collaboration takes place during which the students simultaneously participate in the course of studies at their home universities. In addition, the education is supported by the lectures which are available online. The scope of those lectures covers the subject matter necessary to implement the project.

Three students from each technical university participated in the first round of the project, i.e. from the Warsaw University of Technology, TU Berlin, Politecnico di Milano, NTNU Trondheim. Students of the Warsaw University of Technology were recruited from the Faculties of Power and Aeronautical Engineering, Production Engineering, Automotive and Construction Machinery Engineering as well as Mechatronics. Students from other technical universities were students of master’s degree courses in the field of industrial engineering. More information on the organization of the EET project and the competences acquired by students participating in the program can be found in (Stock and Kohl, 2018, pp. 10–17; Stock et al., 2016, pp. 1–13). The guidelines for conducting this type of projects are presented in (Stock et al., 2017, pp. 33–40). At present, the second round of the project is coming to an end, with four participating students from each university. The following chapters present the assumptions of the project, the learning objectives and discuss the results of the first round, in particular the increase in the scope of the knowledge, skills and students’ competences.

Project initiation

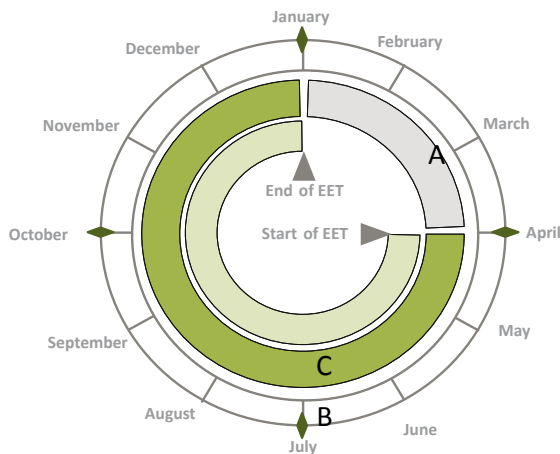
One of the goals set for the EET program is to teach engineers how to make strategic decisions. In business practice, engineers have to solve problems that are not necessarily well defined and are often characterized by high level of uncertainty and complexity (Claesson and Svanstrom, 2015, pp. 073:1–073:7). Students start their work by choosing a problem to solve, understand it, assess the possible solutions, and then develop and document the specific solution that can be commercialized. The meeting of the EET group started with the introduction on systems engineering (Walden et al., 2015, pp. 5–24) and development of start-ups (Stock and Seliger, 2016, pp. 505–512). Such introduction provides students with knowledge about the possible framework for structuring the cooperation.

Despite the fact that all the students have participated in the courses related to mechanics or production engineering, the curricula of universities differ significantly, therefore the scope of knowledge of

International project-oriented training of engineers...

Figure 1. Teaching model in the EET course

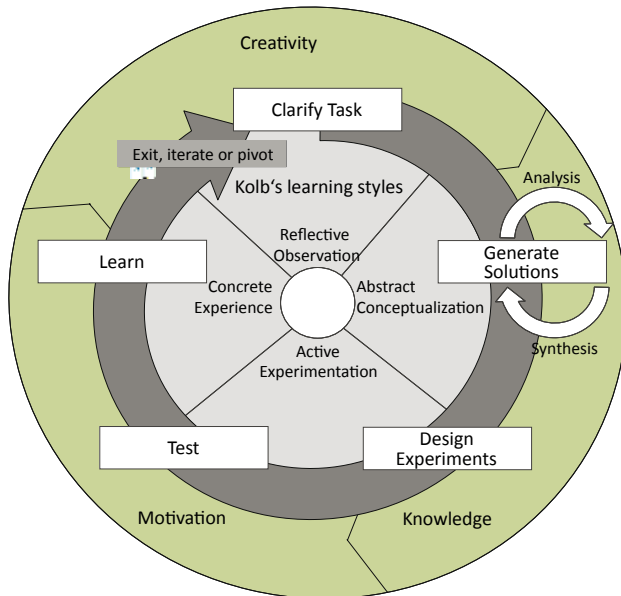
Schedule and phases of the master course



- ◆ Transnational project meeting at a partner university; presence phase for conducting workshops
- A Phase for the acquisition of students and preparation of the project by the teachers
- B Project working phase focusing on the supervised development of a sustainable startup
- C E-learning phase with specific lectures focusing on the development of sustainable innovations

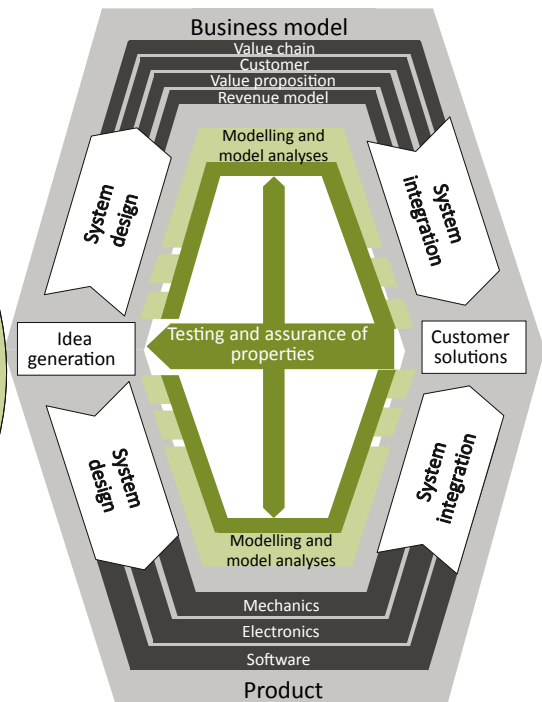
Problem solving procedure

Applied by the students during the project work for solving specific development tasks



Diamond-Model for the startup development

Provides a structure of specific phases for the student project work



Source: Stock and Kohl, 2018, pp. 10–17.

students in the areas such as dynamics, automation, sustainable development concepts or group work skills is very diverse. Tuckman (1965, pp. 384–399) described the stages of development of small teams. Analogous stages of the formation of the EET team are presented in Appendix 1.

An important element in the initiation of the EET project was enabling students to self-formulate a problem and achieve consensus in the group,

regarding the choice of the problem, approach to the solution and the methods of its resolution.

A new approach to mobility in education

Traditional training of engineers at bachelor and master studies, usually does not include innovative projects that require self-development of a solution, ensuring its innovativeness and development of the

methods of its implementation. Independent work of students, which has the characteristics of scientific and project work, takes place in student scientific circles e.g. at the Warsaw University of Technology. An example is the Aviators Scientific Circle operating at the Faculty of Power and Aeronautical Engineering, whose participating students annually take part in the international SAE air competitions in the USA and every year they achieve high rankings as well as receive awards. The students of the Aviators' Circle independently design and build planes in accordance with the rules of the competition, they attract sponsors and initiate project consultations with the teaching staff of the Faculty. The Erasmus+ international exchange program also does not provide the students with opportunities to participate in innovative international projects that require self-development of solutions. The exchange within the Erasmus+ program is rather a duplication of traditional education methods, however, at a partner university. Students' mobility in the Erasmus+ program consists of "moving to a new country" and adapting to the new rules of traditional education for a semester or two. Similarly, students' domestic and foreign internships are a kind of substitute of work on the project, even an international one. A student is a participant in the project for a limited period of time and generally does not take part in all the stages of its development neither is not responsible for making the key decisions regarding the methods of solving certain design tasks.

The EET concept introduces a new paradigm of mobility in education, which is based on the implementation of an engineering project in an international group from the beginning to the end, including the development of a product implementation plan. This is essentially a type of different activity than, for example, the collaboration in scientific circles. Such mobility requires multiple travels for short periods – the equivalent of short business trips, whose aim is to make progress on the project. Working in transnational teams during face-to-face meetings, whose aims is primarily to integrate the existing results and to plan further work, requires the completion and summary of a larger part of project work. After initial planning and subsequent division of work, students return to their home universities, where they continue their normal course of study and work remotely in the EET project using tools such as cloud, teleconferencing, etc., which is both a business practice and a standard in modern enterprises. In addition, students have online lectures at their disposal, prepared by the teaching staff of the universities participating in the project, which facilitate the acquisition of knowledge and engineering skills required for the EET project, including the so-called soft skills. So far, the students have received the following lectures: sustainable value creation, systems engineering, technology management, circular economy, development of sustainable start-ups, sustainable supply chains, virtual and augmented reality, and digital factories.

Requirements and challenges

Participation in the EET program required the students to develop or acquire new knowledge, skills and competences. Each of the universities participating in the EET has a different semester and examination calendar as well as other curricula. It required students of the Warsaw University of Technology to:

- organize individual courses of study, developed with the deans of each faculty,
- develop the curriculum of the "EET project" module, which is part of the program of study for each EET participant,
- assign the appropriate number of ECTS credits to the module, depending on the faculty and the student's master's degree specialization.

An example of the EET curriculum module for the Faculty of Power and Aeronautical Engineering of the Warsaw University of Technology is presented in Appendix 2.

In order to enable reporting of progress of work and asynchronous communication of academic teachers and students, a dedicated internet communication platform has been provided (Stock et al., 2016, pp. 1–13). This platform is also a place for sharing educational materials, and its basic functionalities are a stream of activities, news, groups and discussion forums, online courses, profiles and a cloud. In addition, it was observed that, apart from the online courses, the meetings initiating the project should start with introductory lectures, e.g. in the field of systems engineering. The teleconferences between the teachers and the students were coordinated by an academic center using only one tool (Skype for business). Regarding synchronous and asynchronous communication between the students themselves, the array of possibility was extended, and they could choose such tools such as Skype, Google Hangouts, Slack, Google Drive or Trello (Stock et al., 2016, pp. 1–13).

The varied level of communication skills and social competences of students turned out to be significant and ultimately had an impact on the work in the project. Some of the students noticed that their arguments, the participation in the discussion, and thus the subsequent arrangements in the project, are completely inadequate to their expectations. They believed that "nobody listens to them", "they cannot reach out with their arguments" to other members of the group. They believed that the others left them "out of the circle of discussion" and that other students "quickly get along with each other." It turned out, after the students' discussion with their supervisor, that they spoke too sparingly, did not repeat and nor paraphrased their views and opinions and they spoke in a too soft voice. It was also observed that the reaction of some students to the failure in their communication was often withdrawal, avoidance to accept difficult tasks in the project or a defensive reaction in the form of disregarding the work. The observed cases are examples of typical behaviors of group work.

International project-oriented training of engineers...

The EET project also poses challenges to academic teachers. Above all, leading a group of students educated according to different priorities and study programs, who come from the cultures which perceive technical education differently, using a language other than their native one during the work on the project, caused the teacher to assume a dual role, that of a learner and a leader of the group. The challenge is also to coordinate academic calendars and didactic commitments towards their home universities.

Results

Results of the EET project teams

During the first round of the EET project, the students prepared assumptions for two engineering solutions. These were: a modular pallet and a temperature-maintaining pallet. The task of the modular pallet is to enable deliveries to points of sale in a more flexible manner. The size of one modular pallet is 1/4 of a standard "europallet" (800x1200 mm). The modules are designed in such a way that they can be freely combined with one another, for example, into a 1/2 size pallet or an entire standard pallet. Such solution does not require additional tools for connecting the modules. The students made a part of strength and construction calculations, prepared a preliminary business model and made a physical and virtual model of the pallet (Stock & Kohl, 2018, pp. 10–17). The second solution was the creation of a cover equipped with a wireless temperature sensor, which allows to control the vehicle's cold chamber while transporting temperature-sensitive goods. Students made a physical model and prepared assumptions for a mobile application. They also conducted preliminary numerical simulations and experiments regarding the

change of the temperature inside the cover (Gładysz et al., 2018, pp. 18–25).

Students joining the project set a very ambitious goal for themselves, which was to develop prototypes and prepare business models ready to be implemented and commercialized. Considering the short amount of time for the performance of the entire task as well as the assumption that the members of the group simultaneously perform other tasks related to their regular course of study, such goal was virtually impossible to achieve. However, the students made the models of the pallet and the cover, prepared an initial cost estimate and developed a business model.

Competences of students of the EET project

The surveys were conducted at the beginning, in the middle and at the end of the first round of the EET project. The aim of the surveys was to evaluate the effectiveness of the course curriculum and the assumed approach to education. The surveys were anonymous and completed by all the students. In the surveys, students assessed, on a scale from 1 to 10, their progress in terms of substantive, social, professional and personal competences. The results of the surveys are shown in figure 2. The assessment of the majority of the competences has significantly improved.

In particular, the assessment of competence in the development of start-ups, the development of new processes and products is characterized by a significant increase. At the same time, students assessed that their competences in terms of presentation and mediation, communication and conflict resolution as well as self-confidence, leadership and flexibility in group cooperation have increased. The identified areas of possible improvements in the EET program are the development of students' competencies in the field of sustainable development and problem

Figure 2. Assessment of students' competences



Source: Stock and Kohl, 2018, pp. 10–17.

solving. In the next round of the EET project, special attention will be paid to these aspects. Students' self-esteem coincides with the assessment made by the course instructors from each corresponding university from the didactic point of view, the most important achievement is that the students have increased their competences in the following areas:

- frequent and short-term mobility (four weekly meetings),
- long-term work in geographically dispersed teams,
- defining, analyzing and managing problems that need to be solved,
- understanding the relationship between different disciplines of science, knowledge and business environment.

Summary

The aim of the project was to verify the effectiveness of the proposed approach to inter-university initiatives of engineers with the use of blended learning methods. This approach is designed to develop competences in the field of defining problems related to sustainable development, cooperation in international and geographically dispersed teams, and work in interdisciplinary projects utilizing the knowledge from many fields. The approach turned out to be effective, and the students' competences in the established areas have improved. Despite the large amount of work on the part of the students and leading academic teachers, the logistical challenges in organizing face-to-face meetings and assembling models of designed products, it was possible to develop the models of the pallet and of the pallet cover.

Moreover, it was observed that students of the Warsaw University of Technology are prepared for partnership with students from other universities. At the same time, the areas of possible improvements and modifications of the EET program have been identified, which will be the focus of attention of the program's leaders during its next round. Currently, the third, additional round of the EET program is being implemented. The third round has not been initially planned, however, its implementation demonstrates the commitment of the partners and their belief of the significant didactic value of the EET program.

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Abstract

The paper presents the first cohort of the innovative project “European Engineering Team”, which was conducted within the ERASMUS+ program. The innovativeness of the project lies in the cooperation of 4 European universities of technology and its project-based approach. Students participating in the EET project independently defined problem domains related to sustainability. The mobility attributed to regular ERASMUS+ initiatives was redefined. Students and supervisors had to travel frequently for short periods (4 week-long meetings), reflecting the actual needs and demands of a global labor market. Students cooperate virtually and attend classes in their regular courses at home universities between direct meetings. The goal of this project was to verify the effectiveness of the proposed approach to transnational and inter-university initiatives, utilizing blended learning. The goal was to develop student competencies in terms of sustainability, cooperation in transnational and geographically dispersed teams, who worked on multi-disciplinary problems utilizing knowledge from different domains. The approach was effective and most of the student competences improved throughout the project. However, some areas of possible improvement were defined and supervisors are focused on them during the ongoing second cohort of the EET.

Keywords: project-based learning; experiential learning; blended learning; transnational cooperation; short-period mobility

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Appendix 1. Observations of students' activities during the first EET meeting

Stage	Day	Observation	
Formation		1. Opening presentations of coordinators and academic teachers from universities participating in the project.	
Reaching out	1	2. Discussion of proposed project topics, analysis of alternatives that did not meet the criteria for "sustainable development". Changing the discussion by asking the question "which areas are problematic?", which resulted in the decision to focus on waste management due to the context of the UN's sustainable development goals (UN, 2015).	
		1. Presentation of the "diamond" model for the development of innovations and start-ups.	
Standardization	2	2. Reconciliation of continuation of analysis in the area of waste management based on the EU waste hierarchy (Gharfalkar et al., 2015). Developing a matrix of potential solutions in relation to the waste hierarchy.	
		3. Review of the literature, in order to better recognize and understand the matrix of potential solutions.	
		4. Review of the matrix and the selection of the preferred problem domain (vote).	
		5. Cataloguing the competences of team members. Agreeing on the criteria for assessing alternative proposals and determining the weights of the criteria.	
		6. Combination of certain proposals and ordering problem domains.	
		7. Voting on the preferred problem domain and choosing 3 of them.	
		8. The creation of student sub-groups to the three selected domains, i.e. smart cities, suitability of food for human consumption and packaging.	
		3	1. Mixing groups in order to obtain a new look at the problems.
	2. Groups were encouraged not to focus on specific solutions too early and to maintain three problem areas in order to maintain a multi-dimensional product/problem perspective.		
	3. Student presentations – 3 components: solid waste management in cities, food waste and packaging.		
	4. Comments from the teachers leading the EET program: focus on important economic and other factors causing the generation of waste, thus focus on solving the problem, not removing its symptoms.		
		4	1. Effective students' own work.
	Implementation	5	1. Selection of the project manager in the EET group, assigning students to the groups based on their own preferences, discussions and mechanisms, set by themselves, to ensure the satisfaction of the entire team.
2. Work of project groups to prepare a list of tasks and agree on a detailed action plan for the next direct meeting.			
3. Development of a general action plan for the next meeting.			
4. Group presentations made by the team leader and discussion of the current progress of the group's work. Assigning a teacher to each of the four three-person groups in order to handle: food waste, municipal waste; household waste, packaging waste.			
5. Discussion of teachers leading the EET program and the entire student team.			
6. Individual consultations of teachers with groups of students.			
7. The end of the weekly work period.			

Source: Stock et al., 2016, pp. 1–13; Haskins et al., 2017, pp. 1095–1106.

International project-oriented training of engineers...

Appendix 2. Module EET for master degree studies at MEil PW

Title of the module: European Engineering Team – interdisciplinary and transnational project-oriented learning			ECTS: 24
<p>Module purposes</p> <p>This Master's course module activity aims to incorporate the project-oriented teaching and learning course "European Engineering Teams" into the local curriculum of each university.</p> <p>This course aims to increase the learning and teaching productivity in the education of engineers by establishing an interdisciplinary and international team of students and supervisors from four different European universities. This European Engineering Team (EET) will work together on a sustainable engineering project (selected during the first team meeting) supported by e-learning lectures in form of special lectures (called MOOC's). This module is incorporated into individual study programs for participating students.</p>			
<p>Learning outcomes</p> <p>The globalized European environment is faced with the challenge to meet the continuously growing worldwide demand for capital and consumer goods, while simultaneously ensuring a sustainable environment for human existence. Young engineers motivated to set up sustainable initiatives will be identified and trained in European universities. They will gain knowledge and skills to expand sustainable engineering to competitive innovations for empowering a sustainable development. The mobility and internationalization of workplaces is currently incentivized by the European economy. Human cohabitation within European society will be characterized by cross-border interactions between European citizens. This development can be clearly observed within European companies. Cross-border project works between different sites and transnational cooperation are essential for ensuring competitiveness within increasing globalization. Engineers are not only required to have state-of-the-art technical knowledge, but also to apply it in international teams. They must with colleagues, suppliers, and clients from different countries, operate as part of a team, and master the challenges of virtual cooperation in engineering tasks and within international value chains. Motivated by the needs of modern European society, a multidisciplinary and intercultural team of Master's students from four European universities, the so-called European Engineering Team (EET), will work together on a joint research project aiming for a sustainable technological innovation. The innovation will be subsequently transferred to a sustainable startup, established by the team of Master's students. The European Engineering Team will face challenges of sustainability in engineering science and strongly foster entrepreneurial thinking. Consequently, this Master's module provides the competencies required within a dynamic European economy, by developing skills for working across disciplines, borders, and cultures in the area between new technologies, social change, ecological responsibility, and entrepreneurial opportunities.</p>			
<p>Learning content</p> <p>The teaching and learning activities of the module combines theoretical knowledge transfer, project work, and transnational and intercultural experiences for the students. Also, the teaching and training activities aim to foster sustainable thinking in engineering processes.</p> <p>The following content is to be taught within the module:</p> <ul style="list-style-type: none"> • Working and communicating in transnational and intercultural project teams • International project management • Methods and tools of Sustainable Engineering • Methods and tools of Startup Development • Methods and tools of Process and Product Development • Creative Problem Solving • Virtual communication and project management tools. 			
Parts of the module, workload and credit points (1 ECTS equals 15.0 hours)			
Sustainable Engineering – lectures			60 h
Description of effort	Multiplier	Hours	=
Active time	16.0	1.0h	16.0
Preparation and follow-up time – student work	16.0	2.75h	44.0
Collaboration in transnational projects			120 h
Description of effort	Multiplier	Hours	=
Attendance time	20.0	3.0h	60.0
Preparation and follow-up time	20.0	3.0h	60.0
Project on European Engineering			180 h
Description of effort	Multiplier	Hours	=
Attendance time	15.0	4.0h	60.0
Preparation and follow-up time	15.0	8.0h	120.0

continue – Appendix 2. Module EET for master degree studies at MEil PW

Title of the module: European Engineering Team – interdisciplinary and transnational project-oriented learning	ECTS: 24
<p>Form of teaching and learning The teaching and learning activities of the module will follow the idea of action, in combination with blended-learning. The students from WUT will work together on a project with Master's students from three European partner universities (Norwegian University of Science and Technology, Politecnico di Milano, and Berlin University of Technology), focusing on the development of a technological innovation for coping with a sustainability challenge. All students will select a specific project topic they will work on during the first project meeting. During the last three months of project work, the developed technological innovation will be put into industrial practice by developing a sustainable startup. To support the project work, the teaching and learning activities of the module will also include meetings at each partner university for training the mobility, self, and intercultural competencies, as well as strengthening the teambuilding of the participating students. In order to improve methodical and professional competencies, the project work will be supplemented by e-learning phases, in the form of e-lectures addressing different topics on Sustainable Engineering. In summary, the required teaching and learning workload of 12 ECTS for the module is carried out by three mandatory teaching and learning activities: an e-learning lecture on Sustainable Engineering (2 ECTS), a collaboration on transnational project work (4 ECTS), and a project in European Engineering (6 ECTS).</p>	
<p>Requirements for participation and the exams A good command of the English language is required for transnational project work. Group report documenting full outcome and personal report documenting individual input.</p>	
<p>Duration of the module Two semesters.</p>	
<p>Max. number of participants Four students per university.</p>	
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<p>Lecture notes Available only in the electronic version.</p>	
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The “flipped-hybrid” classroom: A didactic technique for teaching foreign languages

Jeremy W. Bachelor*

The objective of this investigation is to determine if the “flipped” model can be combined with hybrid learning in order to create the “flipped-hybrid” classroom. The flipped classroom refers to an educational model where the traditional practice of dedicating class time to direct instruction is inverted, so that students receive initial content instruction at home. In addition to this, students in this study’s “flipped-hybrid” classroom participated in synchronous online conversations with native speakers and engaged in pre-class activities, thus making a significant component of the course online. The participants in this study, which lasted the duration of the spring 2017 semester, included college level Spanish students. Results from this pilot study suggest that the “flipped-hybrid” technique is a viable alternative to the traditional classroom, provides students with additional opportunities to use the language in authentic situations, and encourages more spontaneous language use. A detailed description of the “flipped-hybrid” classroom and how it differs from a hybrid or a flipped classroom is included, as well as pedagogical implications.

Introduction

Foreign language educators often find themselves in situations where there is simply not enough time during class to teach, provide opportunities for language use, and integrate culture or community into the classroom. Some have found that the flipped classroom is the solution to this problem. In its simplest terms, the flipped classroom is about moving homework to the classroom and moving lecture to the home, so as to “flip” or invert the traditional classroom experience (Gerstein, 2012). While the flipped classroom has been implemented with success in the foreign language classroom (Bachelor, 2017; Torres, 2016), others have expressed concerns about student accountability, technology, and the perceived loss of an active teacher (Lo & Hew, 2017).

The purpose of this paper is to address some of those concerns by creating a new technique: the “flipped-hybrid” classroom. The flipped-hybrid

classroom is different from the flipped classroom in that the latter, in its most basic of definitions, only requires that the lecture take place outside of the classroom; however, nothing is prescribed in terms of that lecture (online videos, recorded audio, or simply pre-class readings), pre-class homework or activities (the earliest flipped classrooms required no outside-of-class homework), time spent online, or the use of the target language (Papadopoulos & Roman, 2010). The flipped-hybrid classroom attempts to create a more structured approach to flipped learning in the following ways:

- lectures take place online
- post lecture activities take place online prior to class
- class time is dedicated to “experiential exercises, group discussion, and question and answer sessions” in the target language (Gerstein, 2012)
- homework is online
- live conversations with native speakers take place online
- 25% of classroom experiences (lectures, post lecture activities, homework, and live conversations) occur online, thus meeting the hybrid threshold (University of Louisville, 2015).

In order to explore the effectiveness of the flipped-hybrid classroom, the present study piloted this technique in the spring 2017 semester. A control group was established for comparative purposes. Additional information about the research method, results, and pedagogical implications are discussed in the following sections.

Background and justification

Lectures, content, and background knowledge have traditionally been presented in class (Johnson & Renner, 2012). For the foreign language classroom, this may pose a particular problem. As the American Council on the Teaching of Foreign Languages [ACTFL] (2010) explains, language educators and their

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students are to use the target language “as exclusively as possible (90% plus),” as this exposure allows students to develop language and sociolinguistic proficiency through comprehensible input. The issue at hand is that “[foreign language educators] are running into grammar-driven settings in which the first language predominates” (Crouse, 2012, p. 27), as many instructors worry that they themselves do not speak the target language well enough to be able to effectively teach grammar without using their first language (Curtain, 2013).

These were the main motivations behind a number of foreign language educators’ decision to flip their classrooms, according to Simon and Fell (2013). However, the idea of flipping the classroom occurred in many other subjects before eventually making its way to the language classroom.

While quantitative and rigorous qualitative research on the flipped classroom is limited, there is a significant body of information available from schools across the country, such as Byron High School in Minnesota, where around 30% of students were passing the state’s math exam; upon flipping their math classes, over 70% of students were passing the same state test (Fulton, 2012). Similar stories come from Woodland Park High School in Colorado, where, according to Bergmann and Sams (2012), chemistry teachers documented great improvement in retention and subject matter understanding, especially for student athletes who benefited from the flexibility the flipped design created. Finally, the teachers at Clintondale High School in Michigan expressed concern that lecture-centered teaching was simply not connecting to today’s student. As such, all freshman-level classes were flipped, which resulted in failure rates dropping by over 30% (Green, 2012).

While these documented cases are promising, the large majority took place at high schools and in core subject areas. Additionally, these cases were not followed by quasi-experimental studies or in-depth analyses in order to discover other potential variables. Some exceptions include the study by Torres (2016), where heritage learners of Spanish documented improvement in their writing skills. Likewise, Bachelor (2017) sought to flip his community college Spanish classroom by employing control and experimental groups. It was found that the flipped classroom students improved in oral communication skills and language spontaneity more than the students in the traditional classroom.

However, as briefly mentioned in the introduction, the flipped classroom model is an extremely vague concept that has been implemented differently across the board. According to Fritz (2013), teachers at the school he studied had interpreted the flipped classroom to mean simply that lecture takes place outside of the classroom and homework takes place inside the classroom. This led teachers at this school to record their lectures as video or audio on CDs or through the school’s learning management system, or to provide students with

pre-class readings that took the place of lecture. Some teachers then handed out what had previously served as homework worksheets and had students fill them out during class time with the help of the instructor and peers (Fritz, 2013). This idea does not lend well to the foreign language classroom, as teachers who strictly follow this model will create an environment where the target language is rarely used in meaningful ways.

Due to this interpretation of the flipped classroom by some, the researcher of the present study decided to modify this model in order to address the above concerns, and combined the flipped classroom with hybrid learning. A class is considered hybrid or “blended” when somewhere between 25–79% of class experiences take place online (University of Louisville, 2015). While the flipped model simply moves lecture to the home and moves homework to the class, a flipped-hybrid class ensures the at-home lecture is interactive and combines new information with follow-up questions and activities, all online. In the traditional classroom, homework is rarely interactive, so the flipped-hybrid technique keeps homework outside of the classroom and moves it fully online. In-class experiences are limited to partner activities, question-answer sessions, role plays, information gap activities, and any other type of activity that cannot be performed alone. Finally, class sessions are followed up with occasional synchronous conversations with native speakers online. All-in-all, the amount of online work is increased significantly so that 25% of class experiences occur online, thus converting the flipped classroom into an interactive hybrid classroom that shares flipped elements.

The study design, including the specifics of how the flipped-hybrid classroom was implemented by this researcher, is found in the following section, along with results of a pilot study of this new technique.

Methodology

The following research questions were written to determine if the flipped-hybrid technique is a viable option:

1. What effect does the flipped-hybrid classroom design have on a foreign language student’s ability to communicate effectively?
2. What effect does the flipped-hybrid classroom design have on a foreign language student’s summative test scores?
3. What effect does the flipped-hybrid classroom design have on the instructor’s ability to speak exclusively in the target language?

The pilot study took place during the entirety of the spring 2017 semester in two sections of SPAN 102, a second semester college-level Spanish course. A college in the Midwest of the United States agreed to participate in this study. Institutional Review Board authorization was granted, and among the two sec-

The “flipped-hybrid” classroom: A didactic technique...

tions of SPAN 102, thirty-seven (37) students chose to participate and signed consent forms, eighteen (18) in the experimental group (section two) and nineteen (19) in the control group (section one). The purpose of the control group was to determine if study results could be attributed to other variables, such as grammar and vocabulary lessons. For this college, thirty-nine (39) students were enrolled in SPAN 102 in the spring 2017 semester; as such, the thirty-seven (37) participants constituted 95% of the available population for this study's sample. Demographics for the groups were consistent with those of the college: the institution directly reported the following (2014): 5,286 students enrolled, 23% minority enrollment, 33% first generation student enrollment, 32% of students received financial aid, average student age of 24, and 16:1 student to teacher ratio.

Throughout the semester, the same content was provided in the two groups via the communicative teaching method by the same instructor, and the students in both groups took the same assessments. However, the second section of students, referred to as the experimental group, learned via the flipped-hybrid technique.

For this study, the flipped-hybrid classroom was implemented the following way:

- students received instruction at home via online tutorials on *MySpanishLab*
- students completed input activities and eText exercises online after the “flipped” video and prior to class
- in-class time was dedicated to communicative activities (task-based activities, meaningful exchanges, problem-solving activities, role-plays) and/or questions
- online synchronous conversations with native speakers via *TalkAbroad* enhanced the student experience, comprising an hour of conversation spread out over the semester.

As a significant amount of additional work was assigned to students in the experimental group (online lectures, pre-class videos, online homework, online synchronous conversations), on ground class time was reduced from four (4) hours weekly to three (3) hours weekly. Students received three (3) on ground credits and one (1) online credit, thus qualifying the course for hybrid classification per the institution where the study took place. The hour per week difference in the control group was primarily dedicated to lecture and input activities, class practices that the experimental group experienced at home.

During the study, the following instruments were employed in order to answer the above research questions:

1. Two oral exams (to answer research question number 1; quantitative component).
2. A final exam (to answer research question number 2; quantitative component).
3. An instructor journal (to answer research question number 3; qualitative component).

The oral exams were created by the course instructor and consisted of role plays with scenarios that were assigned to students randomly. Students conducted role plays with a partner in front of the teacher, although they received individual grades. Evaluation criteria were based on a point system according to the specified category. For example, to receive between 90–100 points out of 100, the student had to use the grammatical concepts covered throughout the semester and incorporate them into his/her speech, incorporate semester vocabulary, use full sentences instead of isolated words, use his/her imagination to develop themes, be enthusiastic, understandable, and avoid English.

Conversely, a student received between 50–64 points out of 100 for failing to contribute to the conversation, using monosyllabic answers, lacking enthusiasm or involvement, or making so many grammatical errors that speech was almost incomprehensible. An example of one possible role-play required students to exchange information with each other to decide if they were compatible roommates.

The final exam for the course included sections on listening, reading, and writing, and covered grammar, vocabulary, and culture. The exam was cumulative and assessed students on *preterit* conjugations (regular and irregular), the *imperfect*, the *preterit vs. the imperfect*, *reflexive verbs*, and *direct, indirect, and double object pronouns*. The results of the pilot study, along with pedagogical implications, are discussed in the following section.

Results

For Instrument 1 (the oral exams), an independent *t* test was used to determine whether two sets of scores were significantly different. This data set was used to answer Research Question 1 on the effect of this design on effective communication among students. The following was found, per SPSS:

Control group: $M=82.51$, $SD=14.60$; experimental group: $M=87.08$, $SD=11.03$; $t(35)=1.0697$, $p=0.2921$. According to SPSS, this difference is not considered statistically significant. However, it should be noted that scores in the experimental group were higher than scores in the control group. The experimental group oral exam average was 87.08%, while the control group average was 82.51%, a difference of 4.57%, which was considered notable by the course instructor.

For Research Question 2 on the effect of this design on summative assessments corresponding to the final exam (Instrument 2), the following was found:

Control group: $M=68.5$, $SD=13.41$; experimental group: $M=72.12$, $SD=18.95$; $t(35)=0.6737$, $p=0.5050$. As with question one, this difference is not considered statistically significant. Likewise, the experimental group average was 72.12%, while the control group average was 68.5%, constituting a difference of 3.62%.

For Research Question 3, the daily teaching journal from the experimental group noted that instructor use of the L1 (English) was slightly reduced, that L1 use by students was also reduced, and that the use of the target language increased slightly among students. The instructor also noted that the flipped-hybrid technique promoted an environment that increased student responsibility and supported a class where all students were engaged.

Pedagogical implications

The flipped-hybrid classroom produces results as equally positive as traditional teaching methods, considering that there was no statistically significant difference between the control and experimental group scores. Therefore, the flipped-hybrid classroom must be considered a viable alternative to the traditional classroom. While the differences were not statistically significant, students in the flipped-hybrid section did perform better in oral exams and in the final exam by approximately 4%, which would constitute a statistically significant difference in larger samples. Due to the improved assessment scores and the conclusions drawn from the journal, the instructor of this course plans to continue with the flipped-hybrid technique in subsequent semesters.

As a viable alternative, this study suggests that the flipped-hybrid classroom is superior in nature due to the approximate 4% difference in scores and to the conclusions drawn from the instructor journal: this design contributes to reducing the use of the L1 among teachers who struggle to explain grammar in the target language, and reduces the use of the L1 among students. Likewise, the use of the L2 among students increased, likely due to the hours' worth of live conversations with native speakers, thus contributing to increased spontaneity among students.

As with all studies, certain limitations exist, such as the data collection period (one semester), and the number of participants. Additionally, applying this design to other settings may not be appropriate, depending on the resources available to the instructor and students. For the present study, *MySpanishLab* was used for online tutorials and activities. These tutorials and activities were created by the textbook publisher. For institutions whose textbooks do not provide online resources, the course teacher would have to create all of his or her own lectures, online input activities, and online homework assignments, which would likely take a significant amount of time and dedication, or, if the new practice became a priority, could lead to adopting appropriate textbooks.

In conclusion, educators seeking to provide their students with additional opportunities to use the target language in meaningful ways should try to implement a version of the flipped-hybrid classroom. Additionally, bringing live conversations with native speakers to students provides them with a sense of

community that is often neglected in the foreign language classroom (Ferrante Perrone, 2015).

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Abstract

The objective of this investigation is to determine if the “flipped” model can be combined with hybrid learning as to create the “flipped-hybrid” classroom. The flipped classroom refers to an educational model where the traditional practice of dedicating class time to direct instruction is inverted so that students receive initial content instruction at home. In addition to this, students in this study’s “flipped hybrid” classroom participated in synchronous online conversations with native speakers and engaged in pre-class activities, thus making a significant component of the course online. The participants in this study included college level Spanish students and lasted the duration of the spring 2017 semester. Results from this pilot study suggest that the “flipped-hybrid” technique is a viable alternative to the traditional classroom, provides students with additional opportunities to use the language in authentic situations, and encourages more spontaneous language use. A detailed description of the “flipped-hybrid” classroom and how it differs from a hybrid or a flipped classroom is included, as well as pedagogical implications.

Keywords: Flipped learning, hybrid learning, foreign language learning, Spanish as a foreign language

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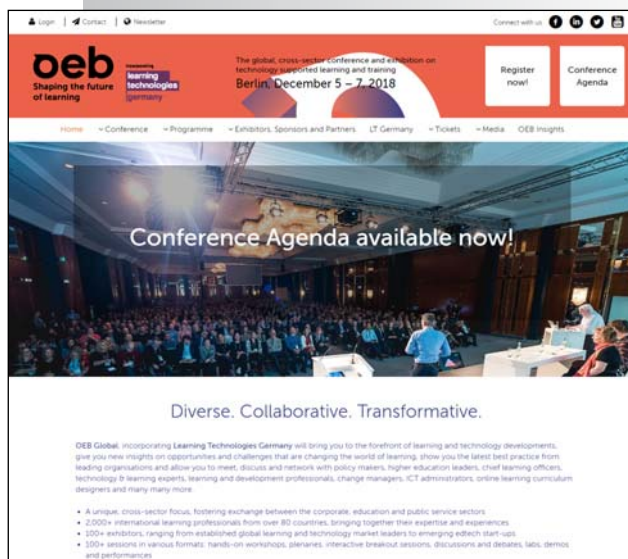
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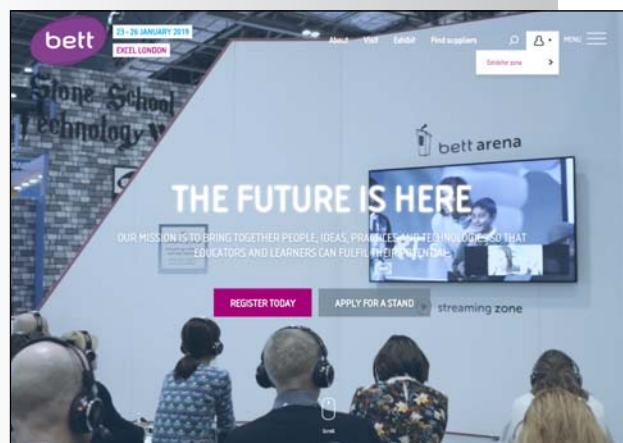
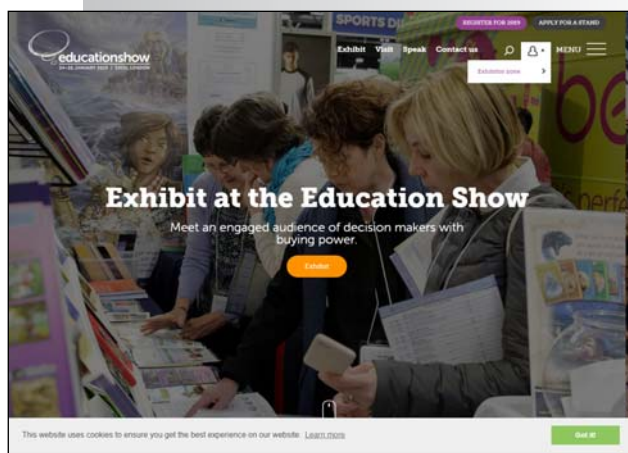
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