

V. E-ENVIRONMENT, SMART-UNIVERSITY AND CYBERSPACE

MAKING A MOVE TO TEACHING IN AN E-LEARNING ENVIRONMENT – GUT PERSPECTIVE

Iwona Mokwa-Tarnowska

Politechnika Gdańska

Gabriela Narutowicza 11/12, 80-233 Gdańsk

imtarn@pg.gda.pl

***Abstract:** Incorporating e-learning resources and activities into a university course curriculum involves restructuring the whole teaching programme to achieve a synergistic effect. It also requires the teachers to acquire appropriate knowledge and develop new skills necessary to supervise the educational process in a new and more versatile environment. The development of web 2.0 technologies has enabled educators to move from instructivism towards constructivism, constructionism and connectivism, that is towards interactive, collaborative and active learning. Not all teachers, however, realise that the shift will help them create a more effective environment. The ideas presented above will be supported by Gdansk University of Technology (GUT's) academics' opinions and attitudes expressed in a survey.*

Keywords: teaching, e-learning, web-enhanced learning, online activities and resources

INTRODUCTION

Incorporating e-learning into teaching is always a challenging move, and it can be successful or unsuccessful. Whichever result will be obtained depends on a wide range of factors – competencies of the staff, their understanding of the possibilities of online environments and their dedication to using new technologies to improve learning experiences being among the most significant ones. The inclusion of e-learning resources and activities in the syllabus involves restructuring the whole teaching programme. It also requires the teachers to gain and develop new skills necessary to supervise the educational process. If such a new environment is to be successful, all the staff responsible for changes in the faculty curricula, i.e., the

decision makers, the developers of online modules and the faculty tutors have to understand both the potential benefits and drawbacks of new learning design.

Technology-supported learning such as e-learning, blended learning or web-enhanced learning is not about replacing or supplementing traditional face-to-face sessions with as many e-learning technologies as possible, and is not about delivery channels. The most important thing in the move is to effectively blend classroom activities with online ones for pedagogic gain.

Although multimedia learning supported by the Internet has been around for approximately twenty years, it can be stated that the rapid advancement of online technologies has not yet resulted in a substantial increase in the number of innovative courses across Polish universities. It seems that numerous academic staff are reluctant to incorporate online technologies into their teaching if they are not obliged to do so by the university authorities. The reasons can be different – unfamiliarity with their affordances, no pedagogical knowledge about how to use them effectively, and heavy workload can be the major factors in academics not wanting to experiment with new methods and environments.

The paper aims to show how the academic teachers who are involved in e-learning at Gdansk University of Technology (GUT) perceive web-enhanced classes and e-learning (Smyrnova-Trybulska 2016), and whether they can engage their students in an active and collaborative development of knowledge and skills through the use of online tools. The presented hypotheses are supported by survey results and discussions with the staff supervising the development of e-learning at Gdansk University of Technology.

1. HOW TO PREPARE TEACHERS FOR A CHANGE IN THE PEDAGOGICAL PARADIGM

An interest in incorporating new technologies into the learning and teaching process has grown considerably over the last years. With the application of web-based systems to education in the 1990s, behaviourist ideas, which flourished in a face-to-face classroom, also entered the realm of virtual learning environments. This was seen in the design of the first e-learning resources, which were very instructivist, and the wording of the aims and objectives of online courses (Heriot-Watt University 1999). Since then the behaviourist paradigm has substantially affected the learning design of educational programmes with online components, and the understanding of learning outcomes, which is visible in many present-day study offers and in the way advisors employed in e-learning support centres structure their sample courses¹.

¹ Association of Academic E-learning in Poland certifies the skills required of e-tutors and holds examinations on passing of which the candidate becomes AEE Certified in Online Learning Design and Development. Being the supervising member of the examination

The development of Web 2.0 technologies has enabled educators to move towards constructivism (Koochang, Riley and Smith 2009), constructionism (Papert, Harel 1991), and connectivism (Siemens 2005). Some of their principles can be seen, e.g., in the affordances of Moodle tools and in the MOOCs provided by the UK's Open University (Mokwa-Tarnowska 2015c). The focus on the collaborative nature of knowledge development and various interactions between and among course participants allows designing resources and activities which shift control to students, increasing their engagement in the learning process (Mokwa-Tarnowska 2015b). Working with authentic sources under the supervision and guidance of the tutor, participating in projects, developing new knowledge through discussions and being part of a community of learners, course participants can exercise more freedom in structuring their own educational paths, which may lead to them becoming self-directed learners in the years to come. The constructivist environment provides a variety of opportunities, methods and tools to build mental models, thus it can better satisfy adult learners' needs. Formative and summative assessment based on problem-solving tasks and open-ended questions could be more beneficiary both for students and tutors, because it focuses on more real-life like interactions. Designing a learning environment which is constructivist in nature is not an easy task. It requires from an educator to acquire a deeper understanding of its pedagogy and the ways of its application to online education.

Involving course participants in the learning process which takes place in a virtual classroom, i.e., increasing their willingness to actively participate in various course activities as well as motivating them to learn on their own at a steady pace, is the responsibility of online tutors. If the learning design of a course with any e-learning components or a course enhanced with web tools does not include pre-emptive or responsive tutor support structures, the learning outcomes may not be as assumed during the preliminary development phase. Even the best resources and activities, effective in a traditional face-to-face classroom, when transferred to an online environment are likely to cause a number of difficulties. Potentially, this contributes to a high drop-out rate and leads to the attendants not meeting the course aims or objectives or both.

An online environment may not be of substantial benefit to students unless it is designed by trained staff who can help less experienced tutors or total beginners in the realm of online education to successfully supervise their courses (Krajka 2012, Allen 2016). Moving from a solely instructive to at least partially constructive approach to teaching opens up new possibilities of creating a successful learning environment. Blending traditional and online education leads to a unique design, which can have a synergistic effect. However, to achieve this goal appropriate conditions for a move towards more innovative educational environment have to be laid down by decision makers, who should devote more

board, over the last three years I have analysed and assessed a significant number of applications and written examinations. The vast majority of both of them in every certification included the description of courses structured only around behaviourist ideas.

time to evaluating online teaching and learning (Tobin, Mandernach and Taylor 2015).

2. GUT TUTORS' APPROACH TO ONLINE TEACHING

Gdańsk University of Technology has a domestic and worldwide reputation of being a significant scientific centre. Its nine faculties give opportunities to create a superior climate for intellectual and personal growth. They provide education for more than 25000 students offering undergraduate, postgraduate and doctoral courses. The total number of academics amounts to approximately 1200. Lectures, seminars and laboratory workshops run in a traditional face-to-face environment are a dominant form of teaching, online assignments and courses being a marginal percentage of the workload assigned to the students. Whichever educational paths GUT students are offered depends on the faculty board, and the directors of the supportive centres in the case of language, mathematics and physical education, as well as on individual academics. There are no full-time courses run online, and only some include online modules or are enhanced by web-based materials. The latter category could be assumed to be the major field of e-learning activity at GUT. The statistics are difficult to obtain because it is not necessary for the academics to report the exact composition of their courses to the authorities. The syllabus must include a division into traditional and online learning only if the course is provided in a blended format – and such types are infrequently delivered at GUT.

2.1 Aims of Introducing Online Resources and Activities

Over the last academic years different online components have been designed to enhance learning opportunities for students attending regular courses offered by the Faculty of Applied Physics and Mathematics, the Faculty of Electrical and Control Engineering, the Faculty of Electronics, Telecommunications and Informatics, the Language Centre and the Mathematics Teaching and Distance Learning Centre². They have mainly aimed: to introduce novelty into teaching and learning, to increase learning opportunities, to provide support, to enable revision, and to prepare the students for blended programmes and self-directed learning. The last few years have seen the emergence of different Web 2.0 tools, so an additional goal has been established, namely to develop various competencies in students such as

² The faculties and centres enumerated in the section are more interested in incorporating e-learning into the curricula of their courses, which is visible in the syllabi uploaded to the university LMS. The other faculties are significantly less advanced in restructuring their educational programmes to include e-learning modules and purpose-designed web-enhanced activities. All the faculties and centres provide their students with additional materials uploaded to Moodle, which constitutes pre-emptive and responsive support coming from the course structure, resources and teachers (Mokwa-Tarnowska 2015a: 81-83).

soft skills, i.e., collaborative, analytical, critical-thinking and reflective skills. To achieve it, website creation and data publishing technologies have been chosen to support web-based tasks.

2.2 Design and Implementation

Academics in the faculties and centres mentioned above have started developing online educational materials using different Web 2.0 tools. Most of them have been uploaded to Moodle, which is the main course management system used at the university, some have been made available through other learning platforms or free Internet technologies. The learning design of the modules is not consistent throughout all the ones that have been made so far as the courses differ in nature, they also serve faculty-specific purposes and are supposed to produce different learning outcomes. The majority of them are still instructive. However, a paradigm shift towards constructivism can be seen. Some tasks developed by the Language Centre involve moving control over the learning process to the students, which helps to create a positive atmosphere encouraging learner engagement in class and outside it, as well as the sense of community.

2.3 Research Methods

The qualitative and quantitative research into the nature of web-enhanced classes and blended courses at GUT, their impact on an increase in student competencies, the quality of online teaching and learning (Półjanowicz, Roszak, Kołodziejczak and Bręborowicz 2014), the tutor' role in a versatile educational environment, and an interest in a move towards e-learning and incorporating more Internet technologies into education is in its initial stage and may include subjective results. Students' and teachers' opinions shown in comments presented in class and outside it, as well as open-ended questions in surveys will help to uncover trends to be further tested using quantitative research, which has just been initiated. Two basic tools have been used so far to produce a qualitative analysis: direct observation and group discussions. The quantitative research whose results are presented in this paper involved a paper survey carried out in June 2017. The research questions were as follows: *How do the teachers and academics at GUT perceive e-learning and web-based education?*, *How do they assess their readiness for teaching in these environments?* and *Do the staff understand the difference between teaching in a traditional and online environment?*

It can be assumed that the composition of the study group was quite homogeneous with respect to many factors: intellectual capacity, interest in e-learning and experience in teaching students of science and engineering. The respondents' technical skills necessary to develop online materials differ substantially and depend on their qualifications, eighteen respondents are ESP teachers whereas the other twenty six academics are science and engineering degree holders.

2.4 Findings

In 2013 I was part of the team who developed and run short, four-hour courses on teaching in an e-learning environment with a focus on Moodle for GUT's academics. They were not compulsory and targeted people who either had some experience in using online technologies or were eager to see how they could enhance their teaching with new opportunities. The attendants, who amounted to 122, came from every faculty and centre. On enrolment they themselves specified their ITC skills necessary to use online tools and were divided into three different-level groups. The course was successful – the participants declared in the survey that they would use e-learning to support their classes, which could improve their students' learning opportunities³. Thus, it seemed that online resources and activities would gain in popularity and that more academics, encouraged by their co-workers, would become interested in web-based education. However, it has not happened so far, the reasons being different. The lack of interest in increasing the rate of e-learning or web-enhanced learning/teaching can be seen in the number of the staff who decided to participate in the survey – it was addressed to the academics who had some knowledge about or experience in using e-technologies and online materials. These who are not involved in online education in any way were reluctant to complete the questionnaire.

Table 1.

Completed courses/workshops on e-learning

Have you ever attended courses/ workshops on e-learning?	Yes, many (%)	Yes, a few (%)	Yes, only one (%)	No (%)	I do not remember (%)	Total number of teachers
Language Centre	11.11	72.22	11.11	–	5.56	18
Mathematics Teaching and Distance Learning Centre	33.33	66.67	–	–	–	3
Faculty of Applied Physics and Mathematics	15.38	7.7	15.38	61.54	–	13
Faculty of Electrical and Control Engineering	–	16.67	16.67	66.66	–	6
Faculty of Electronics, Telecommunications and Informatics	–	25.0	50.0	25.0	–	4

Source: Own work

³ The respondents were asked to rate the usability of e-learning to support their teaching, and the majority of them stated that the course would help them enhance their classes to a great extent (*very good usability* answers: 61% of the beginners, 78% of the participants with intermediate skills, 45% of the participants with advanced skills; *good usability* answers: 33%, 18%, 41% respectively).

The survey shows that almost all the respondents from the centres except one teacher of English⁴ have completed at least one training programme on e-learning, and that more than half of the faculty academics have not participated in any one (Table 1). Training completion is not a prerequisite for running e-learning courses at GUT, because the authorities recognise self-education as a sufficient way of developing knowledge and skills in this field. That is probably why the respondents from the faculties are not very interested in attending such courses (Table 2). However, it can be seen that the teachers from the centres want their training to be more formal, which may be explained by them not being obliged to do research as part of their academic duties. Whereas they can focus on improving their teaching skills, academics in all the faculties have to concentrate on investigating new technological solutions and innovative applications. They are assessed on the basis of their scientific achievements and not on teaching outcomes.

Table 2.**Willingness to attend courses/workshops on e-learning**

Would you like to attend a course/workshop to improve your e-learning skills?	Definitely yes (%)	Probably yes (%)	Probably no (%)	Definitely no (%)	I do not know (%)	Total number of teachers
Language Centre	61.11	27.78	5.55	–	5.56	18
Mathematics Teaching and Distance Learning Centre	33.33	33.33	33.33	–	–	3
Faculty of Applied Physics and Mathematics	23.08	46.15	30.77	–	–	13
Faculty of Electrical and Control Engineering	16.67	33.33	33.33	–	16.67	6
Faculty of Electronics, Telecommunications and Informatics	–	50.0	50.0	–	–	4

Source: Own work

⁴ Only teachers of English participated in the survey. There are very few teachers of other languages in the Language Centre, and they have not enhanced their classes with any e-learning or web-enhanced learning so far.

The workshops run in 2013 showed that GUT's academics struggled with the pedagogical aspects of learning design far more than with the technological ones. This is also visible in the way the respondents in the present survey assess their knowledge about how to teach in an e-learning environment. A substantial number of them are not satisfied with it (Table 3). Their lack of understanding teaching methods and support structures characteristic of online education is also seen in their answers to the open-ended questions concerning assessment, community of learners, motivating and engaging students in learning. The majority of them think that tests, forums and chats are the only engaging activities in an e-learning environment.

Table 3.
Knowledge about how to teach in an e-learning environment

Are you satisfied with your knowledge about how to teach in an e-learning environment?	Very satisfied (%)	Moderately satisfied (%)	Neutral (%)	Slightly dissatisfied (%)	Very dissatisfied (%)	Total number of teachers
Language Centre	5.55	38.89	5.55	38.89	11.11	18
Mathematics Teaching and Distance Learning Centre	33.33	66.67	–	–	–	3
Faculty of Applied Physics and Mathematics	7.69	38.46	–	30.77	23.08	13
Faculty of Electrical and Control Engineering	–	16.67	–	83.33	–	6
Faculty of Electronics, Telecommunications and Informatics	25.0	75.0	–	–	–	4

Source: Own work

Table 4 illustrates how the respondents perceive their skills in developing e-learning materials. It is not surprising that compared with ESP teachers, more academics with a background in science and engineering regard them as excellent or above average. However, more than 60% of the respondents in every group think that their skills are not sufficient, rating them from “average” to “poor”. Many of them would like to participate in a workshop on using tools to produce online materials, which they stated in the comment section that followed the question on attending a training programme in the future.

Table 4.**Skills in developing e-learning materials**

How would you describe your skills in developing e-learning materials?	Excellent (%)	Above Average (%)	Average (%)	Below Average (%)	Poor (%)	Total number of teachers
Language Centre	5.55	5.55	33.33	38.89	16.67	18
Mathematics Teaching and Distance Learning Centre	33.33	–	66.67	–	–	3
Faculty of Applied Physics and Mathematics	15.38	15.38	38.46	7.69	23.08	13
Faculty of Electrical and Control Engineering	–	16.67	50.0	33.33	–	6
Faculty of Electronics, Telecommunications and Informatics	25.0	–	75.0	–	–	4

Source: Own work

The teachers have experience in developing both online resources and activities for use in class and outside it (Table 5). Depending on the subject and the delivery mode of educational materials, the teachers can use web-based resources and activities in class to support their teaching, which is the case for many courses at GUT as most lecture and seminar rooms are equipped with computers and TV screens, which allow displaying and sharing content, as well as collaborating when doing exercises. The focus on active learning is visible in the answers given by the language teachers and ETI academics – both groups develop more online activities than resources. The number of the respondents who have not created their own materials amounts to eight (18.18%). The reasons were not provided in the questionnaire.

Table 5.**Developing e-learning materials**

– Have you developed your own e-learning materials?	Langua ge Centre	Mathem atics Teachin g and Distance Learning Centre	Faculty of Applied Physics and Mathemati cs	Faculty of Electrica l and Control Engineer ing	Faculty of Electronics, Telecommu nications and Informatics
Yes, resources (%)	38.89	100.0	69.23	50.0	75.0
Yes, activities (%)	83.33	66.67	15.38	33.33	100.0
No (%)	16.67	–	30.77	33.33	–

Source: Own work

The answers slightly differ if the question concerning using e-learning materials developed by somebody else is taken into account (Table 6). Assigning online resources made available by other scientists or teachers seem to be popular with the majority of the science and engineering degree holders except the ETI ones, who, like the ESP teachers, find online activities to be of more use. This is consistent with the nature of the courses they run whose syllabi are structured around practical tasks and hands-on experience. Besides, some of the teachers worry that developing online materials and supervising online work will take too much time, so their workload will increase dramatically. However as the literature shows (Bezrouk et. al 2017: 12, Afzal, Safdar and Ambreen 2015) the tutors spend less time explaining the basics, and can devote more time to quality teaching.

Table 6.**Developing web-based materials for use in class**

Have you used online learning materials or web based activities developed by somebody else?	Langua ge Centre	Mathematics Teaching and Distance Learning Centre	Faculty of Applied Physics and Mathematic s	Faculty of Electrical and Control Engineer ing	Faculty of Electronics, Telecommun ications and Informatics
Yes, resources (%)	44.44	100.0	76.92	50.0	25.0
Yes, activities (%)	83.33	66.67	7.69	–	75.0
No (%)	16.67	–	23.08	50.0	–

Source: Own work

The frequency of using e-learning materials (Table 7) does not allow defining the dominant trend. It seems that the answers are correlated with the subjects the respondents teach. As GUT does not offer any entirely e-learning courses, the courses with e-learning modules or enhanced with web-based materials contain some online work, either compulsory or optional, and this supplements or replaces some traditional resources or activities. The respondents do not consider increasing the scope of e-learning within a course as an option, which they stated in the questionnaire. Neither are they interested in becoming online tutors or changing their traditional courses into e-learning ones.

Table 7.**Frequency of using e-learning materials**

How often do you enhance your face-to-face classes with some e-learning?	Language Centre	Mathematics Teaching and Distance Learning Centre	Faculty of Applied Physics and Mathematics	Faculty of Electrical and Control Engineering	Faculty of Electronics, Telecommunications and Informatics
Every week (%)	16.67	100.0	38.46	66.66	–
Every 2 - 3 weeks (%)	22.22	–	15.38	–	75.0
Every month (%)	38.89	–	23.08	–	25.0
Every 2 - 3 months (%)	16.67	–	7.69	–	–
Never (%)	5.55	–	15.38	33.33	–

Source: Own work

The staff who completed the questionnaire would appreciate introducing online collaborative projects into the curriculum for degree courses (Table 8). Approximately 60% of the respondents think that they could be either extremely or very effective, and another 25% will accept them as an option. Only one person cannot see their suitability, and one has no opinion. Some of the respondents explained in the comment section that such an assignment would increase workload both for them and for the students, but it would open up new possibilities of acquiring different skills than those that have been targeted now. Although they were not explicitly named, what they meant in their comments were probably soft skills

Table 8.**Online collaborative projects**

Do you think that online collaborative projects can be effective?	Extremely (%)	Very (%)	Moderately (%)	Slightly (%)	Not at all (%)	I do not know (%)
Language Centre	20.45	40.91	25.00	9.09	2.27	2.27

Source: Own work

However, the staff are virtually uncertain about whether they would like to supervise online collaboration or not (Table 9). Only almost 30% of the teachers with some knowledge about e-learning are willing to face the new challenge – none of them has ever taken up such a responsibility – and 50% cannot decide if they would like to be involved in that. This probably results from their lack of experience and appropriate competency, which they noticed when they were asked about teaching in an e-learning environment. For such projects to be effective, they must be supervised by tutors with expertise in constructivist, constructionist and connectivist paradigms, because these approaches support collaborative and cooperative studying, help to understand how to build a community of learners, and allow designing highly interactive activities.

Table 9.**Supervising online collaborative projects**

Would you like to supervise online collaborative projects?	Yes (%)	No (%)	I do not know (%)
Language Centre	29.55	20.45	50.00

Source: Own work

The survey shows that there is a move towards e-learning at Gdansk University of Technology, but it is very slow. More teachers than research academics are interested in changing their teaching practice. It can be explained by the fact that the latter are under serious pressure to devote their efforts to scientific work, and that their teaching experience is of secondary importance to the university authorities, which is the case for all Polish universities as they are assessed on the basis of the quality of their research activity. However, a limited number of the staff are interested in enhancing their classes with web-based resources and activities because they are looking for an environment that will better motivate and engage young digital natives (Prensky 2001a, 2001b).

FINAL REMARKS

A post-modern understanding of teaching can enhance the learning process by providing course participants with a versatile environment structured around online technologies. When students learn from materials prepared using different tools, they develop new literacies, which help them become more inventive and efficient pursuers of knowledge and skills in a new digital age. According to Lamy and Hampel (2007, 43), who agree with Kress and van Leeuwen (2001), literacy involves the ability to understand not only a written text but also images and sounds (E1-Hindi 1998; Leu et. al. 2004). Resources and activities that involve a new mode of delivery, which is possible to achieve by implementing web-based education, can trigger various interactions between the students and the teacher. They can effectively engage them in learning and teaching if the environment is properly designed.

Blending and enhancing face-to-face classes with Web 2.0 technologies can lead to a very successful outcome if the pedagogical approach is based on the principles of constructivism, constructionism and connectivism – the paradigms which support learner autonomy, community integration and social interactions, cognitive processing strategies, problem solving through interactive processing of information to develop new mental models, peer review and collaborative learning by doing. A carefully structured environment by course developers and tutors can result in better learning outcomes measured by instruments available through the use of online tools. It is not sufficient to replace some traditional resources and activities that have always taken place in the classroom with their equivalents developed in a new environment, using innovative technologies. An online component for use in class or outside it has to be incorporated into the learning design in a meaningful way so as to enhance and improve the learning experience.

Both educators and students must feel comfortable using new solutions and must be positive about the shift (Kisanga 2016). The former should realise what they can achieve by changing the environment, and the latter must understand why web-based education has been incorporated into the curriculum of the course. An online environment can pose a challenge for inexperienced or untrained teachers who have never dealt with web-based courses or for those who do not see the synergy that can be gained through interactions offered by the blend of environments. Raising teachers' awareness may result in them being more willing to make a move towards web-enhanced learning or even e-learning.

REFERENCES

- Afzal, M., T., Safdar, A., Ambreen, M., 2015: *Teachers perceptions and needs towards the use of e-learning in teaching of physics at secondary level*, Alberta Journal of Educational Research, August 2015, [online] https://www.researchgate.net/publication/280920751_Teachers_Perceptions_a

- nd_Needs_towards_the_Use_of_E-Learning_in_Teaching_of_Physics_at_Secondary_Level (accessed 11 July 2017)
- Allen, M., 2016: *Guide to e-learning*. Wiley, Hoboken, 2016, pages 408, ISBN: 971119046325
- Bezrouk, A., Nosek, T., Smutný, M., Kopeček, M., Voda, P., Hanuš, J. and Stránský, P., 2017: *(MSL) Multiple step e-learning practical – computed tomography*. In *Distance learning, simulation and communication 2017, proceedings*, ed. M. Hrubý. University of Defence, Brno, 2017, pages 9-14, ISBN: 978-80-7231-415-7
- El-Hindi, A., E.. 1998: *Beyond classroom boundaries: constructivist teaching with the Internet*. The reading teacher. International Reading Association, [online] <https://eric.ed.gov/?id=EJ567322> (accessed 9 July 2017)
- Heriot-Watt University, 1999: *Lola: Learning About Open Learning, Training Manual*: Heriot-Watt University, Glasgow.
- Kisanga, D., H., 2016: *Determinants of teachers' attitudes towards e-learning in Tanzanian higher learning institutions*, International Review of Research in Open and Distributed Learning, 17/5, ISSN: 1492-3831, [online] <http://www.irrodl.org/index.php/irrodl/article/view/2720/3879> (accessed 11 July 2017)
- Koohang, A., Riley, L., and Smith, T., 2009: *E-learning and constructivism: from theory to application*, Interdisciplinary Journal of E-Learning and Learning Objects, 5, 2009, [online] <http://ijello.org/Volume5/IJELLOv5p091-109Koohang655.pdf> (accessed 20 July 2017)
- Krajka, J., 2012: *The language teacher in the digital age – towards a systematic approach to digital teacher development*. Maria Curie-Skłodowska University Press, Lublin, pages 344, ISBN: 978-83-7784-131-0
- Kress, G., van Leeuwen, T., 2001: *Multimodal discourse: the modes and media of contemporary communication*. Arnold, London, 2001, pages 152, ISBN-13: 978-0340608777
- Lamy, M-N., Hampel, R., 2007: *Online communication in language learning and teaching*. Palgrave Macmillan, Basingstoke, 2007, pages 260, ISBN: 1-4039-1185-1
- Leu., D. J. Jr., Kinzer, Ch., K., Coiro J., L., Cammack, D., W., 2004: *Toward a theory of new literacies emerging from the Internet and other information and communication technologies*, [online] https://www.researchgate.net/publication/265628542_Toward_a_Theory_of_New_Literacies_Emerging_Fr

om_the_Internet_and_Other_Information_and_Communication_Technologies (accessed 6 July 2017)

- Mokwa-Tarnowska, I., 2015a: *E-learning i blended learning w nauczaniu akademickim: zagadnienia metodyczne*. Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2015, pages 178, ISBN: 978-83-7348-613-3
- Mokwa-Tarnowska, I., 2015b: *How to engage students in online learning – web-enhanced and blended ESP classes*. In *IT tools – good practice of effective use in education*, ed. E. Smyrnova-Trybulska, Studio Noa, Katowice, Cieszyn, 2015, pages 81–88, ISBN: 978-83-60071-82-3
- Mokwa-Tarnowska, 2015c: Motywowanie uczestników MOOC-ów, *Edukacja 1 (9)*. 4-11, ISSN: 2081-870X
- Papert, P., Harel, I., 1991: *Constructionism*. Ablex Publishing Corporation, [online] <http://www.papert.org/articles/SituatingConstructionism.html> (accessed 6 July 2017)
- Półjanowicz, W., Roszak, M., Kołodziejczak, B. and Bręborowicz, A., 2014: *An analysis of the effectiveness and quality of e-learning in medical education* In: *E-learning and intercultural competences development in different countries, monograph*, sc. ed. E. Smyrnova-Trybulska, University of Silesia, Studio-Noa for Katowice-Cieszyn, 2014, pages 177-196, ISBN: 978-83-60071-76-2
- Prensky, M., 2001a: *Digital natives, digital immigrants*. *On the Horizon*, 9 (5), 2001, 1-6, ISSN: 1074-8121
- Prensky, M., 2001b: *Digital natives, digital immigrants, part 2: Do they really think differently?* *On the Horizon*, 9 (6), 2001, 6, ISSN: 1074-8121
- Siemens, G., 2005: *Connectivism: a learning theory for the digital age*, [online] <http://www.elearnspace.org/Articles/connectivism.htm> (accessed 19 July 2017)
- Smyrnova-Trybulska, E., ed., 2016: *E-learning, vol. 8, E-learning methodology – implementation and evaluation*. Studio NOA for University of Silesia, Katowice, Cieszyn, 2016, pages 479, ISBN: 2451-3644
- Tobin, T., Mandernach, B., J., Taylor, A., H., 2015: *Evaluating online teaching: implementing best practices*. Jossey-Bass, San Francisco, 2015, pages 304, ISBN: 978-1-118-91036-8