e-mentor

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Dear e-mentor readers,

I have a great pleasure to present the 70th issue of the academic journal E-mentor, which at the same time is the first international issue fully in English. E-mentor covers quite a wide range of topics concerning the use of ICT in business and education, as well as different means of building and sharing knowledge through formal, informal and lifelong learning. A few papers included in the current issue refer to the general concepts like social constructivism or the role of teacher empathy and its impact on student engagement. Two others present the global solutions like degree reform in Scandinavian higher education or the process of creating the Global Campus at the University of Illinois. A significant part of the issue has been dedicated to sharing good practices of teaching and learning at higher education institutions in Poland and in the United States. We strongly believe that presented ideas and solutions could serve as an inspiration for other academics around the world.

We also hope that this first attempt to broaden access to the valuable content of our journal will correspond with the expectations of our readers and the potential contributors as well. It is planned that in the coming year 2018 three English issues will be published. Researchers and teachers from HE institutions interested in publishing with e-mentor may refer to the brief guide for authors published on the last but one 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.

Current edition has been prepared in collaboration with the University of Illinois at Springfield (USA). Three articles out of 10 has been written by the academics from that university. We would be happy to collaborate with HE institutions interested in publishing the block of articles presenting best examples of teaching practice or research carried out by their staff.

Maria Zając
Editor

Social Constructivism in Online Learning: Andragogical Influence and the Effectual Educator

Scott Secore

Today's educational landscape is changing swiftly. Technology is steadily improving, and the demands of the modern workforce weigh heavily on both businesses and the individuals within; and so, it is imperative that higher education keeps pace accordingly. As adult learners return to school in record numbers, online (distance) learning has become a prevalent staple of academia. As a result, the learning models and teaching methods applied in online courses have arisen as a contentious source of debate. Research and expert opinion often point to constructivism – more specifically, social constructivism – as the preferred delivery mode for online learning and adult education (andragogy). However, latent ideologies and assumptions of both constructivism and andragogy, coupled with technology's overwhelming influence on contemporary education, leave the door open for continued argument regarding its impact on both the student and the teacher. Consequently, this raises several critical questions. First, what exactly are constructivism and social constructivism? Second, how does social constructivism work? Third, what roles do students, teachers, and technology play in the learning process? Lastly, how do the distinctions of andragogy affect social constructivism in online teaching?

What are Constructivism and Social Constructivism?

Constructivism, as a learning theory, implies that learners conceive understanding and form meaning via a blend of their own existing knowledge base, their actions, and their individual experiences. Simply put, newly acquired information builds upon previously obtained knowledge to "construct" broader cognizance. As such, knowledge acquired by the learner is not pre-specified, and evaluation of learning is more subjective, since it does not rely on explicit quantitative criteria (Duke, Harper, & Johnston, 2013, pp. 4–13).

The genesis of modern constructivism is arguably derivative of both late 19th century-early 20th century existentialist philosophy (e.g. Kierkegaard & Nietzsche) and functional psychology (e.g. James & Dewey), as both disciplines intrinsically explore the relationship(s) between one's personal environ-ment and experiences, and their effects on cognition, behavior, and choice. In contemporary academia, however, the germination of constructivist ideologies resides in Piaget's theory of cognitive development, wherein Piaget (1936, 1952) hypothesizes that intellectual growth is a process occurring in incremental stages as one adapts to their environment. Adaptation transpires through assimilation and accommodation, where the individual progressively incorporates new experiences into old experiences, thus altering how they think and perceive the world around them. In essence, the individual learns through discovery, as personal development precedes learning. Accordingly, constructivism is learner-centered, meaning that the theoretical focus on learning resides with the student, not the teacher. However, as the instructor serves to advance the process and ensure scholarship, the role of the instructor is crucial. At its root, in true constructivist learning, the following four epistemological maxims exist and/or occur:

- Knowledge conception is a result of active cognition;
- Learning is adaptive and more steadfast given the proper environment;
- Subjective thinking – organization and sensible comprehension of the learner's experiences – is applied; and
- Learning involves social, cultural, and language-based processes (Doolittle & Camp, 1999; Gergen, 1995, pp. 17–40; von Glasersfeld, 1984, pp. 17–40; Vygotsky, 1978).

These four dictums form the basis of – and provide the building blocks for – the constructivist learning theory. Doolittle and Camp (1999, p. 5) neatly surmise that:

Constructivism acknowledges the learner's active role in the personal creation of knowledge, the importance of experience (both individual and social) in this knowledge creation process, and the realization that the knowledge created will vary in its degree of validity as an accurate representation of reality.

Nonetheless, the seemingly malleable nature of these four precepts often leads to interpretive deviation. Consequently, varied casts (e.g. cognitive, radical, and social) of constructivism are common. However,

only one truly accentuates and applies all four of these epistemological tenets: Social Constructivism.

The origins of social constructivism lie at the heart of Vygotsky's social development theory (1978), in which he stresses the fundamental role of social interaction in cognitive development (McLeod, 2014). In contrast to Piaget, Vygotsky (1978) argues that learning and development do not materialize in predetermined stages, nor does the individual need to adapt to and/or approach the process alone [discovery]. Rather, learning is a collaborative activity wherein the environment influences the individual, and learning propels development. Ozer (2004) offers a précis:

> For Vygotsky, the zone of proximal development – the distance between the actual development of a child as determined by independent problem solving, and the level of potential development as determined through problem solving under adult guidance or in collaboration with more peers – suggests that cognitive development is limited to a certain range at a particular age. However, with the help of social interaction, such as assistance from a mentor, students can comprehend concepts and schemes that they cannot know on their own (para. 11).

Therefore, such strong emphasis on the aforementioned tenets of constructivist learning provides recognition to the social disposition of constructivism, signifying an outcome of attained knowledge through social interaction, and thus implying it is a shared experience and not an individual experience (Doolittle & Camp, 1999; Prawatt & Floden, 1994, pp. 37–48).

Embedded within the framework of social constructivism one will find two approaches, or models, for which learning outcomes take place: Cooperative/Collaborative and Sociocultural. In many respects, social constructivism is a meld of these two approaches, as it essentially applies the underlying principles that shape each approach.

Social Constructivist Learning Models

Cooperative/Collaborative

The first approach to social constructivist learning is the cooperative/collaborative model. While there is discussion as to whether this is an actual form of constructivist learning, or rather an offspring closely related to the constructivist model, the heart of the cooperative/collaborative model nevertheless underscores the impactful role of social intercourse in the learning process (Leidner & Jarvenpaa, 1995; Schell & Janicki, 2013).

According to Leidner and Jarvenpaa (1995), learning occurs when an individual interacts with other individuals; specifically, *as individuals exercise, verify, solidify and improve their mental models through discussions and information sharing* (p. 268). In educational settings, the cooperative model stresses and encourages communication among peers to both aid and strengthen the learning experience (Schell & Janicki, 2013). Advocates of cooperative learning believe that increased levels of interaction ultimately result in boosted creativity, critical thinking, and knowledge construction (Schell & Janicki, 2013). Additionally, collaboration also elicits participation, and contributes to improving communication and listening skills (Leidner & Jarvenpaa, 1995). Simply put, learners must interact with one another to attain meaningful knowledge acquisition (Chametzky, 2014, pp. 813–821).

Sociocultural

The second learning approach is the sociocultural model. According to Carswell (as cited in Carwile, 2007, p. 1), the sociocultural model asserts that *learning best occurs when the learning event is meaningful, more deeply or elaborately processed, situated in context, and rooted in the learner's cultural background and personal knowledge*. Put another way, learning has roots in both social and cultural contexts, wherein the individual's total environment influences their ability to acquire knowledge, develop critical thinking skills, and form meaningful connections.

Notwithstanding, debate exists in relation to sociocultural learning, as some aspects of the model seem to oppose the cooperative/collaborative model – chiefly its individualistic tendencies. These leanings go hand-in-hand with the cooperative/collaborative model, although, as Doolittle and Camp (1999, p. 8) opine, *social interaction always occurs within a sociocultural context, resulting in knowledge that is bound to a specific time and place*. Similarly, Leidner and Jarvenpaa (1995, p. 270) posit that instruction within the sociocultural model is always *culturally value laden and embedded in a person's everyday cultural/social context* (p. 270). Further still, a main goal of constructivism is to create an information object-rich and socially meaningful (i.e. communication and collaboration filled) learning environment (Gold, 2001). As such, individualization of cooperative learning in a sociocultural context occurs when the student "interprets and assimilates the new knowledge, embedding it within his or her individual experience" (Carwile, 2007, p. 2). Thus, despite debate, assertions concerning the aims of sociocultural learning hold true.

Social Constructivist Online Teaching

Doolittle and Camp (1999, p. 9) propose that the following eight factors are essential to constructivist pedagogies:

- Learning should involve social negotiation and mediation;
- Content and skills should be relevant to the learner;
- Teachers serve primarily as guides and facilitators of learning, not instructors;
- Learning should take place in authentic and real-world environments;
- Teachers should provide for and encourage multiple perspectives and representations of content;

- Content and skills should be construed within the framework of the learner's prior knowledge;
- Students should be measured formatively, serving to inform future learning experiences; and
- Students should be encouraged to become self-regulatory, self-mediated, and self-aware.

In formulating how an online social constructivist approach to pedagogy may work, one might consider these eight factors. And by nature, online education mostly encapsulates all of them. However, the last three factors proposed by Doolittle and Camp (1999) are not consistently, or easily, gauged. For instance, acknowledgment of – and provision for – a pupil's pre-existing, current, and future knowledge is sometimes difficult to measure in an online setting – particularly in asynchronous environments. Without presumption on the part of the instructor, or an existing relationship between the instructor and the student, asynchronous environments often require a healthy dose of direct and/or indirect assessment. Likewise, most students jump into online learning unprepared, due to their naivety about the differences from traditional learning (Bowman, 2012). For that reason, it would appear that self-regulation, self-mediation, and self-awareness are really prerequisites for online learning, as they are vital to the learning process, yet are not effortlessly acquired skills.

As mentioned before, social constructivism employs a mixture of both the cooperative/collaborative and sociocultural models of learning. Therefore, the learner gains knowledge through meaningful social interaction with others, and applies that information to a context in which they are familiar and to which they can relate. Based on Doolittle and Camp's (1999) pedagogical factors – and despite social constructivism being identified as learner-centered – successful learning achievement within a social constructivist framework places a great deal of the onus on the teacher. This is especially true in an online setting.

As suggested earlier, a constructivist teacher is more a catalyst for learning than a traditional instructor; wherein the primary focus of the teacher is the learning process itself and the outcomes it produces (Carwile, 2007). As defined by Schell and Janicki (2013, p. 29), *The role of the instructor in this setting is to act as a guide in the learning process. The instructor poses questions for the students to think about and then the instructor helps students navigate toward answers*. In other words, the instructor is more than a facilitator of learning, but also a mentor, a consultant, and a coach (Vonderwell, Liang, & Alderman, 2007, pp. 309–328). Gold (2001, pp. 35–57) elaborates on this premise further, proposing that teachers of online courses fill three fundamental roles: organizational, social, and intellectual.

The teacher's *organizational* role is to lay the groundwork for discussion, meaning that they must establish and present objectives, rules, and timetables for the course (Carwile, 2007, pp. 68–73; Gold,

2001, pp. 35–57). The teacher's *social* role is creating a safe, positive, friendly, and motivating environment that fosters an open and meaningful learning experience (Carwile, 2007, pp. 68–73; Gold, 2001, pp. 35–57; Huang, 2002, pp. 27–37). This is achievable as *Good moderators often send out welcome messages, use a personal tone, and seed their feedback with specific examples and references* (Gold, 2001, p. 43). Lastly, and perhaps most importantly, the teacher's *intellectual* role is to serve as a facilitator of understanding. By emphasizing crucial discussion points and primary ideas embedded within facts, as well as asking questions, soliciting responses, provoking critical thinking, and developing themes that relate to assignments, teachers can better ensure knowledge acquisition (Gold, 2001, pp. 35–57; Mayer, 1996). Mayer (1996) explains constructivist teaching, and teachers, as follows:

> Constructivist teachers frame instruction, so their students can understand the relevance of new knowledge. Relevance need not preexist in students; when it doesn't, constructivist teachers nudge students to gradually realize the relevance of their emerging knowledge by encouraging them to explore new materials and solve problems (para. 11).

In this setting, students are not only learning the course material, they are also discovering their own abilities to contemplate and research a topic (Schell & Janicki, 2013). However, as online learning does not offer the same methodologies used in traditional learning environments – such as face-to-face communication, libraries, and resource rooms – student approaches to learning, discernment, and critical thinking have seen alteration. As such, existing learning principles and methodologies are progressively becoming reflections of their social environments (Siemens, 2005, pp. 1–8). In this way, Mayer's description of constructivist learning and teaching extends beyond convention.

According to Siemens' (2005, pp. 1–8) theory of connectivism, in today's technologically reliant world, learning no longer occurs within the individual – as proposed by constructivism. Rather, much like social constructivism, it also occurs outside the individual (i.e. learning that is stored and manipulated by technology). Consequently, social learning has become a complex (non-linear) and globalized system of networks that create connections from which people can quickly draw information outside of their primary knowledge base, and take action accordingly. Simply put, learning is no longer an individualistic activity (Mattar, 2010, pp. 1–16). Duke et al. (2013, pp. 6) summarize:

> The individual does not have control; rather it is a collaboration of current ideas as seen from a present reality. The core skill is the ability to see connections between information sources and to maintain that connection to facilitate continual learning.

Given the perpetual evolution of technology, and its subsequent influence on educatory practices, metamorphoses in both learning and instruction

are inevitable. For that reason, prudent and routine consideration to technological, epistemological, and pedagogical transformations concerning instructional design and dissemination is imperative. That is to say, teachers must demonstrate diligence in both course construction and presentation to provide an environment that fully adopts the social constructivist model. Therefore, as technology continues to radically modify the higher education landscape, and reshape how people communicate and learn, Gold's (2001, pp. 35–57) suggested teacher roles remain both relevant and vital for online learning.

The Influence of Andragogy on Social Constructivist Online Teaching

Social constructivism also appropriates philosophies and theories often associated with adult learning, or andragogy. Knowles (1980, 1984) proposed the following six assumptions, or principles, that he felt were applicable to adult learners:

- Self-concept: As people mature, they move from being a dependent personality toward being more self-directed;
- Experience: Over time, adults amass a growing set of experiences that provide a prolific resource for learning;
- Readiness to learn: As people mature, they are more interested in learning subjects that have immediate relevance to their jobs or personal lives;
- Orientation to learning: There is a change in time perspective as people mature. They advance from gathering knowledge for future use to the immediate application of knowledge. Thus, adult learners are more problem-centered than subject-centered;
- Motivation to learn: As a person matures, they become motivated by various internal incentives – such as need for self-esteem, curiosity, desire to achieve, and satisfaction of accomplishment; and
- Relevance: Adults need to know why they need to learn something. Furthermore, because adults manage other aspects of their lives, they are willing and able to direct and participate in the planning and implementation of their own learning (Keesee, 2010; Knowles, 1980, 1984).

Brookfield (1995) also pinpointed four major areas of research that he felt were germane to adult learning. Similarly to Knowles, Brookfield's (1995) conclusions revolved around self-direction, critical thinking, experiential learning, and the ability to "learn how to learn." Additionally, Huang (2002, p. 33) recognizes that in both constructivism and andragogy the learner seeks to assume ownership of their education, stressing:

Adult learners want to learn skills related to their real life or work experience. Thus, the belief of educators in teaching should be grounded in adults' experiences,

and these experiences represent a valuable resource. The learning environment should provide real-world, case-based environments for meaningful and authentic knowledge.

All of the inferences made by Knowles, Brookfield, and Huang have a central function in social constructivist learning, regardless of the learner's age. As discussed earlier, the second factor of Doolittle and Camp's (1999) constructivist pedagogy contends the relevancy of both content and skills to the learner. Doolittle and Camp (1999) concisely summarize this, and all Knowles', Brookfield's, and Huang's affirmations, by stating:

If knowledge is to enhance one's adaptation and functioning, then the knowledge attained (i.e., content and skills) must be relevant to the individual's current situation, understanding, and goal. This relevancy is likely to lead to an increase in motivation, as the individual comes to understand the need for certain knowledge. Ultimately, experience with relevant tasks will provide the individual with the mental processes, social information, and personal experiences necessary for enhanced functioning within one's practical environment (p. 9).

This sentiment is significant to online settings as the environment provided by the instructor needs to correspond to something familiar to the student – both pragmatically and conceptually. Additionally, in this setting, diversity among students varies greatly, and every student brings a different set of experiences to the table. As a result, recreating authenticity may prove a formidable task. However, a social constructivist approach, combined with connectivist ideologies, affords the instructor the ability to implement contextualized instructional strategies that precipitate self-direction and motivation, as well as simulate authentic life scenarios.

Foremost, students need comfort and "safety" in a learning environment, and in regard to the learning experience (Chametzky, 2014, pp. 813–821; Millheim, 2012). As discussed earlier, many students – adult learners in particular – often enter the world of e-learning unprepared. The same holds true for instructors new to the format. Consequently, both may experience uninvited stress and anxiety. Morrison (2014) expounds:

Students need a wide range of skills to learn successfully in online settings; they need to be tech savvy, know how to collaborate with peers, conduct online research, navigate proficiently within the learning management platform, manage their time effectively and engage in the learning process by interacting with content, peers and completing course work via the learning platform (para. 1).

Nonetheless, undue stress and anxiety of this type are avoidable. By supplying a copious array of resources to students, instructors can both streamline the learning process and better align their students with course objectives. Naturally, resource specification and accessibility are tailorable to any given context. Thus, resources addressing the technical, academic,

and study skills of the student will not only help curb apprehension, they will also help to improve efficiency (Morrison, 2014).

Further still, and perhaps more importantly, the socio-constructivist environment more closely mimics the type of environment the student will face, or is presently facing, outside of schooling (Schell & Janicki, 2013). In the "real world," persons with instantaneous answers and validity about a problem are not always available. Correspondingly, the individual must utilize their resources, collect data, arrive at a conclusion, process a judgment, and act accordingly. Sound familiar? As mentioned previously, in a constructivist setting students not only learn course material, they also uncover their ability to explore and research a topic. Schell and Janicki (2013, p. 30) assert that *the student who has learned to discover knowledge for himself/herself is better prepared to come to a conclusion and the supporting process that led to the conclusion*. Apropos this concept, instructors of online courses can promote authenticity by designing course plans and activities that reflect *real-world problems and their practical solutions* (Chametzky, 2014, p. 816). Whether collaborative discu ssion posts, or independent research projects, structured assignments with open-ended themes afford students the opportunity to explore solutions to problems relative to their personal plight. Akin to real life, tangible means and objectives are requisite for rightful ownership of learning, as well as successful learning outcomes. As such, educators employing a social constructivist approach to online teaching bear enormous responsibility toward furnishing students with academically amenable environments armed with the tools required for maximization of the learning experience.

Conclusion

As the workforce and technology continue to evolve, and online educational opportunities become a mainstay in our higher educational system, one can easily perceive the advantages to application of social constructivist learning in an online setting. The model, as defined, checks all the boxes of desired qualities, format, and outcomes the contemporary student needs – be they typical college-aged students or adult learners. While the social constructivist model places the student at the forefront of the learning process, it is clear that the role of the instructor is of equal importance and value to the overall learning experience – even in an asynchronous format. The teacher's ability to create and foster an environment suitable for open, engaging, and meaningful interaction, coupled with their capacity to quickly assess and establish a unifying epistemological foundation and curriculum design authentic to "real-world" application is paramount to student success. Though social constructivism is learner-centered, without an effectual instructor expected learning outcomes may never be fully satisfied.

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Social Constructivism in Online Learning: Andragogical Influence and the Effectual Educator

As adult learners return to school in record numbers, online (distance) learning has become a prevalent staple of academia. Accordingly, how best to facilitate and ensure successful "e-learning" experiences is the focus of much debate. Utilization of constructivist learning models often enables this education process. However, constructivist doctrine and the realities of learning in adulthood present ostensible juxtaposition regarding student-teacher precedence in the "classroom". While students are fundamentally the center of both constructivism and online learning, the onus lies with the teacher to provide students with an environment in which to flourish. This article examines the basic concepts of constructivist and social constructivist learning, highlights their relative andragogical similarities and influences, and underscores the critical role of a teacher in an online social constructivist setting.

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Development of soft skills in higher education – case study

Anita Zarzycka

In her article, the author discusses the problem of skills of higher education graduates being inadequate to the expectations of employers, particularly in terms of soft skills, and the necessity to introduce changes in the curricula, resulting from this inadequacy. The purpose of this publication is to present theoretical assumptions of the "Soft skills in the centre of attention" project carried out at Łazarski University from the academic year 2013/2014 and practical ways of implementing it together with the analysis of applied solutions from the point of view of assumed objectives. The article is based on the observations of the author who has been a course tutor since academic year 2014/2015.

There are many definitions of the term "soft skills" and the very concept of "competencies". The classic definition is based on the origin of this term, which comes from the expression *competentia* that means having knowledge and powers to make judgements or specific decisions on legal matters. To place this statement in contemporary perspective, as W. Armstrong says, a competence is a broadly defined human development potential – the ability to solve new problems, to innovate, to behave entrepreneurially and to adapt to changes (Stabryła, 2010, p. 330). This potential consists of both hard (professional) skills and soft skills, i.e. social, behavioural skills (Tomczak, 2015, pp. 27–34).

Nowadays companies operate in a very volatile environment; new technologies and global competition force the fast pace of changes. As a result, the most valuable employees are those who are able to generate those changes, understand them and adapt their behaviours to the new reality (Kocór & Strzebońska, 2011, pp. 10–11, pp. 58–63). Employers search for employees with a high level of soft skills and they are not satisfied with the way the graduates are prepared in this area (Pieniążek, Przybył, Pacuska, Chojecki, Huras, Pałka, Ratajczak, & Rudolf, 2014, p. 170).

Publicly funded projects, financed under OP KED programme, that enhance competencies of students are carried out at universities[1]. However, as in the case of Human Capital Operational Programme they allow universities to train students in the last semester of their studies (Rules of Competition no. 2/PRK/POWER/3.1/2016 in Competence Development Programme of training course within the framework of enhancing skills of persons participating in higher education, corresponding to the needs of the economy, labour market and society), which, according to the author, is not an optimal solution. In literature, it is particularly stressed that, in the case of trainings the effect of which is supposed to be the change of attitude, the results may be measured only after several months of practicing newly acquired skills (Kunasz, 2008, pp. 129–141).

Another significant issue is the importance of students' soft skills for the quality of educational process. If we take a look at the list of skills indicated by employers as the most desirable, we will find:
- effective communication,
- openness to learning and continuous development,
- being active and getting engaged (*Kompetencje i kwalifikacje poszukiwane przez pracodawców wśród absolwentów szkół wyższych wchodzących na rynek pracy*, 2012).

Employers also underline the lack of teamwork skills as well as project-related skills. It can be observed that skills required by employers are at the same time skills that are vital for effective learning and teaching (The Recommendations of the European Parliament and the Council of 18 December 2006, 2006/962/EC).

Many lecturers express their concern regarding the inability to communicate with students, their low active participation in classes and group projects and students' lack of interest to acquire knowledge (Wieczorkowska, Wierzbiński, & Michałowicz, 2012, pp. 63–78). Nonetheless, according to the author, real and systematic action to improve the situation is rarely taken. Changes forced by the creation of the

[1] Particularly regarding priority axis: „Increasing competencies of persons participating in education at higher level, responding to the needs of economy, labour market and society", OP KED, www.ncbr.gov.pl (12.09.2017).

National Qualifications Framework[2] consisting in the obligation of describing the results of teaching of every course, including social skills, are often useful only to make a record in the syllabus. Most of the courses are still oriented towards the transmission of the knowledge and the lecturers underestimate the added value which could arise if they felt responsible also for, even a small improvement of soft skills (Frankowicz, 2017).

Another reason for introducing soft skills training in the first year of studies is to make students aware of the discrepancy between their own assessment of their level of skills possessed by them and the assessment of the lecturers and employers. The study conducted by the Polish Educational Research Institute called "Demand for skills and qualifications and their supply - study results" showed that secondary school students and higher education students consider their level of soft skills as high, which differs from the assessment of those skills by employers (Chłoń-Domińczak, Kamieniecka, Trawińska-Konador, Pawlowski, & Rynko, 2015, pp. 48-50). The problem of students' excessively high self-assessment and the resulting lack of motivation to improve overall skills in terms of soft skills may constitute a serious obstacle for teaching. The notion of competence ladder presented by L. Rae presupposes the existence of four levels of competences, i.e.:

- unconscious incompetence,
- conscious incompetence,
- conscious competence,
- unconscious competence (Rae, 2006, p. 86).

Young people, unaware of their deficiencies, do not find motivation to improve their soft skills and do not engage in classes, which results in the lack of development (Taradejna, 2014, pp. 22–26).

Universities have little influence on the level of soft skills of admitted students. The current university admission system, based on the results of secondary school final exam, allows for the assessment of knowledge, but in no way does it reflect the level of soft skills that the candidates have. However, according to the author, higher education institutions should actively influence the level of those skills among those who leave the university, particularly in terms of the changes of academic assessment system proposed by the ministry[3]. The emphasis on teaching soft skills from the very beginning of the university studies will not only allow to provide the training itself, but it will also give time to practice the acquired skills and to change one's attitude (Sienkiewicz, 2013, p. 71).

Teaching soft skills at Łazarski University – the beginning of the project

The idea of including soft skills in the curriculum appeared at Łazarski University in the academic year 2012/2013 as a result of a series of modern techniques and methods of teaching trainings. The trainings brought together a group of dozen educators with different lengths of service, who shared their experiences and opinions concerning the quality of students' work during the training. Most opinions focused on the fact that students are not properly prepared to study in the sense of improving their knowledge under the guidance of a professional. They lack independence, the ability to search for sources, to make arguments and often also the courage to publicly present their opinions. Sharing educational experiences coupled with reading of the report indicating competency deficiencies of the university's graduates (Dzierzgowski, Fenrich, & Stempień, 2012, pp. 1–104) led to the introduction of changes in the curriculum that adjusted it to the requirements of the labour market. The newly introduced course is obligatory for all students of the first year of undergraduate education or long-cycle studies, regardless of the faculty and the field of study[4]. Students pass the course on the basis of grades and ECTS credits.

The first stage of the project was to define its main objectives from the point of view of the university. After a discussion, the educators involved in the project[5] selected several basic skills the teaching of which was to be the main part of the course. These were:

- use of sources,
- formation of arguments,
- debating and making short statements based on scientific facts and
- self-organization of work.

The students learnt the above mentioned skills, preparing during the whole semester, under the guidance of professors, an Oxford-style debate on a chosen topic.

From the very beginning the integration aspect of the new course was also very important for the university. Student groups were formed in such a way that students had to meet with students of other fields of study and work in interdisciplinary groups.

At the end of the semester, after the debate and the summary of the students' work, it turned out that the course in this form did not meet the expectations. Most students did not engage in classes more than it was required to pass the course. A discussion with the lecturers that taught the class and with selected students

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[2] Since September 2016 University provisions concerning Polish Qualificaiton Framework have been in place.

[3] National Polish Monitoring System of Economic Fates of Graduates of Universities (ELA) creates university rankings based on data representing graduates' salaries. Considering the importance that employers attach to soft skills, it seems reasonable that the level of soft skills affects the salary. Por. J. Balcar, 2014, pp. 3–15.

[4] There are two faculties with six fields of study at Lazarski University – the Faculty of Law and Administration and the Faculty of Economics and Management.

[5] During the work on the main principles of the project and during the first years of its implementation, dr Grażyna Czetwertyńska from the Faculty of Artes Liberales of the University of Warsaw was the course assistant and offered support for the teacher staff of Lazarski University.

revealed that the tasks turned out to be too difficult for many students, remaining beyond their capabilities, especially in terms of self-organization and teamwork. Foreign students faced particular difficulties as, despite their knowledge of Polish on a level not lower than B2, they often were not able to form utterances at a level that was satisfactory for them, which led to frustration and giving up on work. Students experienced problems also with such tasks as: formal email communication, writing longer texts, using basic computer programs, preparing public speeches and using online resources to search for information.

Teaching soft skills – the present state

The main objectives of the project remained unchanged, but the course itself was completely modified. A differentiated approach to students was adapted in order to give the poorest students the opportunity to fill their individual skill gaps and to give the best students the opportunity of further development under the guidance of individual tutors. A much bigger emphasis is now placed on explaining the purpose of the course to the students and helping them understand the point of engaging oneself in acquiring new skills.

In the academic year 2016/2017, the course included two semesters of classes in the first year of studies, regardless of the field of study and the course of study, and both semesters differed from each other in terms of the classes.

An important formal change that was introduced after first experiences was to hire a course assistant – a person responsible for maintaining the consistency of the rules, the assessment of the classes, the selection of teaching staff and the duties related to the formal aspect of the course.

Especially the last part of the course assistant job is particularly important as the course is constructed differently than the rest of the courses in the studies programme. Classes are held in groups of different numbers, depending on individual needs of the lecturers and the nature of the classes. Classes within one group are taught by different lecturers, some classes are held one after another, others are not obligatory. Due to different levels of competences possessed by students and big differences between full-time students and part-time students or students of different years, the course is characterized by great flexibility, which causes many formal difficulties.

The first semester is mainly aimed at integration of students, teamwork and improving language skills of foreign students. Considering the business nature of the university, it was decided that students would work on their own ideas for business or social or charity events in small interdisciplinary groups. It also motivates them to gain knowledge and hard skills in terms of entrepreneurship and allows the university to add another objective into the course, often requested by employers, - shaping the entrepreneurial mind set (Pieniążek et al., 2014, p. 173), but not limited only to educating students as future business owners, but including also, if not primarily, educating employees who show entrepreneurial skills in their workplace.

The classes begin with a joint lecture, during which the assessment principles for the course, the rules of cooperation in class groups and project groups and the rules of communication with the lecturers are presented. Students also meet the lecturers and the course assistant.

The formation of project groups is very important for achieving the assumed objectives. The groups are selected randomly. Students from several subgroups are included in each project group – foreigners and students from each field of study are selected separately. The purpose of such practice is to form interdisciplinary groups and to avoid a situation in which foreign students constitute the majority of a group, which is important for improving their language skills.

The lack of discretion in the choice of groups results in dissatisfaction among students – every year, the week after the drawing occurs, deanship and the class' supervisor note a significant increase of the number of requests for transfer to different class or individual course passing mode. However, thanks to school authorities' understanding of the course's aims the transfers may be limited to a minimum.

In the subsequent weeks students create their own business models on the basis of A. Osterwalder and Y. Pigneur method (Osterwalder & Pigneur, 2012). The results of the works are subjected to a discussion within the class groups and assessment by the lecturer, often times by the guests invited to the class who have business experience. This allows to shape the ability of making a meaningful assessment of others' work and of shaping the responses and protecting one's own ideas.

The significant element of the weekly work's presentations is the rule stating that every class member has to do a presentation – it results in the impossibility of excluding the weakest or unprepared students from presenting their works. It encourages Polish language students to help students from abroad in preparing the statements in Polish language because a good speech of each group member provides a better group grade which ultimately influences each student's final grade.

The semester ends with discussing the reports in which every student assesses his/her and other students' work and involvement, as well as with classes summarizing students' experiences from group work. Students formulate conclusions relevant to group members' attributes and attitudes that enhance their effectiveness on flipcharts, stating which behaviors cause the non-productiveness and sharing with each other the ways of dealing with unwanted behaviors.

The best projects are assessed during the annual gala by a number of judges that are not from the school. Also students' answers to questions from experts are assessed. The gala takes place outside the school and is of more ceremonial nature than an average lecture which increases students' motivation. The gala that took place during the 2016/2017 academic year at the National Stadium was attended by families, workmates

and participants' supervisors. Each participant receives a souvenir from the sponsors and the winner team has a possibility to develop their idea during accelerative workshops organized by the sponsor.

The second semester begins with the continuation of the group work's subject area. It is a complement of a training cycle in accordance with Kolb's cycle – during the first semester students gain the experience and discuss their reflections on working in groups, while in the second semester they get to know the theory and are encouraged to use their gained knowledge in practice during the following group activities (Kolb, 1984).

The other class modules include the shaping of competences that are considered by group of lecturers as crucial for further studying and for students' adjustment to the labour market. The students learn how to effectively search for various information on the Internet; they get to know the rules governing the use of the libraries, databases, and discover how to distinguish between scientific and popular sources. The subsequent modules are devoted to creating personal brand in social media, building up one's portfolio of achievements and describing it in CV, as well as proper behavior during job interview. The students also get to know the methods of taking notes, creating mind maps, effective learning and memorizing.

The semester is created in a modular way – the students have lectures and practical classes from various modules, they realize both group and individual tasks that together comprise their final grade. The innovation targeted at enhancing students' motivation to work within the framework of individual modules is the way of accessing that applies the elements of competition. Interestingly, the students during the evaluative assessment of the class indicated that the elements of competition had no influence on their motivation, but the analysis of passing individual modules indicates a significant improvement of the timely submitted tasks in relation to the previous year when the method was not used.

The issues and results of the project

The issues that the team of lecturers face are mostly relevant to didactic work with project groups and with the necessity to solve crises in groups. For the majority of students this is usually the first group project in their lives that lasts more than two weeks. The group projects that were realized in school consisted in doing the work during the lesson or for the subsequent lesson; very few students have an experience of working in any group that was fulfilling the tasks for a longer period of time. Apparently, the teachers did not devote sufficient time to analyzing the quality of group work and the involvement of particular people in obtaining the final result, which caused the ambitious students' perpetuation that it was better to do the whole job alone, and the less ambitious students' perpetuation that they do not have to do anything in order to get a good grade because the others would still do the job for them.

In a situation in which the project lasts longer and the way of assessing makes the abovementioned behaviors difficult, a conflict in a group is likely to appear. Already after the first edition of the subject in this formula it turned out that the lecturers of the particular practical groups have to know the tenor of a group process and be able to show students the ways of facing difficult situations. The leaders of the project groups, who are responsible for the work of the whole group and often face the problems related to enforcing the work upon others, require close attention and assistance. The practical verification of students' perception of their own managing skills makes them seek knowledge of the ways of effective team management, and tools that might be helpful in it. Enhancing management competencies, although it was not originally a project objective, constitutes an important added value, especially for students studying Management.

The amount of work and time devoted to a subject by the lecturers is significantly bigger than the one in case of traditional academic subjects. On the other hand, based on conversations with the lecturers, it is precisely the subject which gives an unbelievable satisfaction, countervails work routine and induces enhancing one's didactic, coaching and tutoring skills. It appeared to be extremely helpful to have people with psychological experience, people with professional coaching background and manager-practitioners in the team of lecturers. As is turned out, they constitute the necessary substantive and expert support.

Another positive aspect of the subject is the improvement of the level of soft skills among students – in the evaluation survey conducted in 2016/2017 academic year over 96% of students declared improvement from the level at which they started the subject and 90% found the classes useful on the labour market and enhancing their professional development. The fact that students add their projects and trainings completed within the subject to CVs and that they believe that they are an important information for potential employers may be the proof of appreciating experiences and skills gained by students.

Due to only three-year period of project execution, it has not yet been possible to carry out the studies among graduate students, thus it is not possible to answer the question whether the scope of soft skills is assessed by the employers in a better way than it was assessed in case of previous past graduate students. However, it can beyond any doubt be stated that the subject met with great approval and attracted interest from the school's business partners, who appreciate its innovativeness in the field of soft skills teaching.

Throughout the duration of the subject the lecturers cooperate with students closely, getting to know both their talents and development potential very well. The best students (to be understood as not only ones with best grades but primarily considering their level of involvement) receive an offer of participating in Honorable Program – an individual tutoring programme which enables students not only to develop themselves scientifically but also to follow their passions and organize various projects and ventures under the watchful eye of experienced tutors.

Summary

In the 2013/2014 academic year a group of didactics at the Łazarski University, in cooperation with the authorities of the university initiated the project „Soft skills in the center of attention" targeted at improving the level of soft skills among students and better adjusting the skills of graduate students to the labour market. The project originally included one semester of classes during which the students prepared for Oxford debate. However, such a formula of a project prevented realization of the assumed objectives, which is why during the following years many changes were introduced which enabled its better adjustment to students' potentials and an increase of awareness of the importance of soft skills among academic staff and students.

The project characteristics presented in this study and the description of the difficulties that the team of realizers faced may serve as a collection of clues for other universities that wish to introduce similar solutions.

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Development of soft skills in higher education – case study

According to many reports, skills of higher education graduates are inadequate to the needs of employers, especially in the area of soft skills. At the same time many lecturers observe problems in communication with students, their low participation in classes and projects and as a result low quality of teaching. In the article author presents a project "Soft skills in the centre of attention" which was an attempt to adjust the curriculum to the requirements of the labour market. The project was carried out at Łazarski University from the academic year 2013/2014 and it has been changed a lot during this time. The changes enabled better adjustment of the formula to students' potentials and an increase of awareness of the importance of soft skills among academic staff and students. In the academic year 2016/2017 project course included two semesters of classes in the first year of studies, regardless of the field of study. The first semester is mainly aimed at integration od students, teamwork and improving language skills of foreign students and the second at creating the personal brand and building up one's portfolio of achievements and describing it in CV. Students also learn how to search databases, make notes, create mind maps and discover the methods of effective learning and memorizing. The projects characteristics presented in this article may serve as a collection of clues for other universities that are looking for similar solutions.

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Investigation of educational processes with affective computing methods

Agnieszka Landowska

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This paper concerns the monitoring of educational processes with the use of new technologies for the recognition of human emotions. This paper summarizes results from three experiments, aimed at the validation of applying emotion recognition to e-learning. An analysis of the experiments' executions provides an evaluation of the emotion elicitation methods used to monitor learners. The comparison of affect recognition algorithms was based on the criteria of availability, accuracy, robustness to disturbance, and interference with the e-learning process. The lessons learned in these experiments might be of interest to teachers and e-learning tutors, as well as to those researchers who want to use affective computing methods in monitoring educational processes.

Introduction

Humans are emotional, and that characteristic influences all aspects of individual functioning. Although computers are mechanical entities, interaction with them is influenced by the user's affective states. In some computer application domains, the emotionality of users may influence the effectiveness of performed tasks.

One of the domains where emotions might play a crucial role is e-learning. Research on educational processes provided evidence that some emotional states support learning processes, while other suppress them (Hudlicka, 2003, pp. 1–32; Paiva, Dias, Sobral, & Woods, 2004; Picard, 2003, pp. 55–64; Sheng, Zhu-ying, & Wan-xin, 2010, pp. 269–272). In a traditional classroom, teachers address affective issues, such as fatigue, a lack of concentration, low motivation or boredom (Landowska, 2013, pp. 16–31). Human mentors devote at least as much time and attention to emotional goals as they do to the achievement of cognitive goals (Elliott, Lester, & Rickel, 1999, pp. 195–211).

The domain that deals with recognizing user emotional states in human-computer interaction (HCI) is affective computing (Picard, 2003, pp. 55–64). Affective computing has developed methods for recognizing human affect, which all differ on their input information channels, output labels or representation models, and classification methods.

Although a number of emotion recognition algorithms are known, the question of their applicability in monitoring educational processes remains open. This paper aims to investigate this issue and evaluate the applicability of emotion recognition techniques in e-learning process analysis. During the last 2 years, a series of experiments was undertaken at Gdansk University of Technology, aiming to monitor emotions in educational contexts. These experiments involved the observation of users performing e-learning tasks in a laboratory setting. Multiple observation input channels were recorded and analyzed using emotion recognition techniques. We noticed that the availability and value brought by specific observation channels differ a lot, depending on the educational task or even the learner. The methods differ also on compatibility, robustness to noise and subjectivity. In the literature, we found no clues for choosing a particular observation channel for monitoring affect in education. This paper presents a cross-analysis of three experiments, performed from the perspective of the availability of observation channels and the value provided for monitoring affect in education. The paper summarizes the lessons learned. The research question of the paper is formulated as follows: *Which observation channels used in emotion recognition are available, robust and valuable, in the educational context?*

This paper is organized as follows: the *background* section reports on previous research on affective learning and affective methods. The *research methods* section includes the operationalization of variables and a description of the experiments. The study results section presents an analysis of the affect recognition methods investigated in these experiments and a comparison of those methods based on defined criteria. The summary of lessons learned and discussion section provides a summary of the results and some discussion, followed by the conclusion.

Background

Works that are related to this research fall into three categories:
(I) studies on emotional states in learning processes,

(II) research on affective computing methods, including emotion recognition, representation and processing by intelligent software,

(III) studies on affective learning supported with emotion recognition technologies.

(I) There are multiple studies on how emotional states influence the learning process and many of them precede automatic affect recognition technology. The findings from this literature constitute the background for our analysis and can be formulated as follows:

- emotional states of very high or very low arousal (both positive and negative valence) disturb learning processes (Elliott et.al., 1999, pp. 195–211),
- educational processes are supported by states of engagement, concentration and flow (Klein & Picard, 2002, pp. 141–169; Baker, 2007, pp. 1059),
- different emotional states support different learning tasks (Kapoor, Mota, & Picard, 2001, pp. 2–4),
- slightly negative states are better than positive ones (surprisingly, negative states foster critical and analytical thinking) (Baker, 2007, p. 1059; Ben Ammar, Neji, Alimi, & Gouardères, 2010, pp. 3013–3023),
- emotional states with a higher dominance factor support the learning process (moderate anger is better than fear in an educational environment) (Ben Ammar et al., pp. 3013–3023; Hone, 2006, pp. 227–245).

(II) The literature on affective computing tools is very broad and has already been summarized several times, for example by Zeng et al. (Zeng, Pantic, Roisman, & Huang, 2007, p. 126) or by Gunes et al. (Gunes & Schuller, 2013, pp. 120–136). Here the most relevant literature findings related to emotion recognition are summarized below:

- Emotion recognition methods might be based on diverse input channels (and not all of them are available in the target e-learning environment). One can distinguish algorithms based on visual information processing (Zeng et al., 2007, p. 126; Binali, Potdar, & Wu, 2009, p. 259–264; Bailenson et al., 2008, pp. 303–317), algorithms based on body movement analysis (Zeng et al., 2007, p. 126; Boehner, Depaula, Dourish, & Sengers, 2007, pp. 275–291), algorithms based on text analysis (Maria & Zitar, pp. 695–716; Neviarouskaya, Prendinger, & Ishizuka, 2009, pp. 278–281; Binali et al., 2010, pp. 172–177; Ling, Bali, & Salam, 2006; Li & Ren, 2008), algorithms based on voice signal processing (Elliott et al., 1999, pp. 195–211), algorithms based on standard input device usage pattern processing (Kołakowska, 2013), and algorithms based on physiological measurement interpretation (Bailenson et al., 2008, pp. 303–317; Picard & Daily, 2005; Wioleta, 2013, pp. 556–561).

- The emotion recognition techniques provide results in diverse models of emotion representation: a valence-arousal dimensional model (Yik, Russell, & Barrett, 1999, pp. 600–619), the PAD (pleasantness-arousal-dominance) model (Mehrabian, 1996, pp. 261–292) or Ekman's six basic emotions (Scherer & Ekman, 1984) model, extended by neutral state. Some emotion elicitation algorithms provide results as a single label pair (e.g., stress-no stress).
- Emotion recognition algorithms differ significantly in emotion recognition accuracies and granularity. The most accurate results are usually obtained for two-class recognition. Another approach to increase accuracy is using a combination of the observation channels and fusing the results.
- All input channels are susceptible to disturbances and the applicability of emotion recognition might be significantly influenced by that fact. For example, emotion recognition via facial expressions is susceptible to illumination conditions and occlusions of parts of the face (Landowska, 2015, pp. 1–9). Using a combination of observation channels is also an option for addressing this issue.
- All emotion recognition techniques are based on observable symptoms of affective states. The symptoms (e.g., facial expressions) might have a major drawback – they could be to some extent controlled by humans and therefore the recognition results might be intentionally or unintentionally falsified (Landowska & Miler, 2016, pp. 1631–1640).
- Self-reports on emotions, although subjective, are frequently used as a "ground truth". The second approach from the literature is multi-channel observation and consistency checks (Bailenson et al., 2008, pp. 303–317). A third approach is manual tagging by qualified observers or physiological observations.

These findings influenced the decisions on the design of the experiments described in this study, especially the use of more than one observation channel.

(III) The combination of affective learning and affective computing is not new, as affective computing researchers often apply their methods in the learning process analysis. The most spectacular application scenarios include examples of affective learning companions and affective tutors; however, the affect-awareness mechanisms might be much simpler. Moreover, lots of methodological and didactic findings are achieved by means of technology-enhanced learning monitoring (Landowska, 2013, pp. 16–31). The unquestionable achievement of affective computing is research on the states of frustration and flow and on emotional states in different types of educational tasks (Maria & Zitar, 2007, pp. 695–716). However, the research usually focuses on one perspective or

one emotional state only, e.g., only on frustration or only on boredom (Bessière, Newhagen, Robinson, & Shneiderman, 2006, pp. 941–961; Scheirer, Fernandez, Klein, & Picard, 2002, pp. 93–118; Ang, Dhillon, Krupski, Shriberg, & Stolcke, 2002, pp. 2037–2040). The concept of concentration or flow states (effective states) as an oscillation between boredom and frustration (ineffective states) is the most popular approach in studying e-learning processes. For example Woolf, Burleson, and Arroyo (2009) proposed a set of useful cognitive-affective terms scales for emotion labeling dedicated to learning processes. The states were additionally assigned with a numeric representation of desirability in educational processes (for example concentration was rated 2 – highly desirable', while boredom was rated 0 – 'not desirable') (Woolf et al., 2009, pp. 129–164).

As far as we are aware, there is no systematic review of emotion recognition methods summarizing applicability in monitoring e-learning processes. Moreover, no criteria have been defined to choose among competitive solutions for emotion recognition.

Research method

Within the study of emotion recognition in e-learning processes monitoring, three quasi-experiments were undertaken. The experiments were held at Emotion Monitor stand at Gdansk University of Technology. The stand is a configurable setting allowing for the multi-channel observation of a computer user (Landowska, 2015, pp. 75–80). Based on the experiments' results, the criteria for evaluation of applicability were selected and analyzed.

### Emotion observation channels evaluation criteria

The observation channels used in each experiment were evaluated. The general research question on the availability and value of emotion observation channels was distilled into five criteria, provided below.

1. **Availability** – this represents the degree to which an emotion recognition technique based on a particular observation channel is available in the application context. E-learning can occur in various locations (e.g., at school/university, at home, or outdoors) and with diverse models

(e.g., synchronous, asynchronous). Both the location and model influence the availability of observation channels. Moreover, the availability of the channel might also be task-dependent (that is, in one task a channel might be available and in another it might not, e.g., textual input) or user-dependent (e.g., a user might not have a camera or might switch it off). The availability metric in this study is assigned the following values: AV – channel available, NA – unavailable, TD – task-dependent or UD – user dependent.

2. **Robustness** – this represents the degree to which an observation channel can handle disturbances in the context of e-learning. All channels are susceptible to disturbance; however, some might be more or less likely to be disturbed in an e-learning environment. The robustness metric is rated on a scale of low–medium–high, where a higher score is better.

3. **Compatibility** – this represents a factor of match between the emotional states under investigation and the emotional states provided by the emotion recognition tools. According to related work on affective learning (summarized in background section), the most frequent subject of interest in e-learning is the state of flow as an oscillation between boredom and frustration (see Figure 1). The emotion recognition techniques provide outputs with diverse emotion representation models, which are more or less compatible with the point of interest in e-learning. The compatibility factor is rated on a scale of low–medium–high, where a higher score is better.

4. **Independence** on human will is an important factor, if one wants to use the emotional states as an additional source of knowledge on the subjective internal cognition of systems. The emotion recognition techniques differ significantly in independence (e.g., self-report is the most dependent on human will and is also susceptible to intentional and unintentional falsification). The independence factor is rated on a scale of low– medium–high, where a higher score is better.

Figure 1. Representation of flow as a state between frustration and boredom
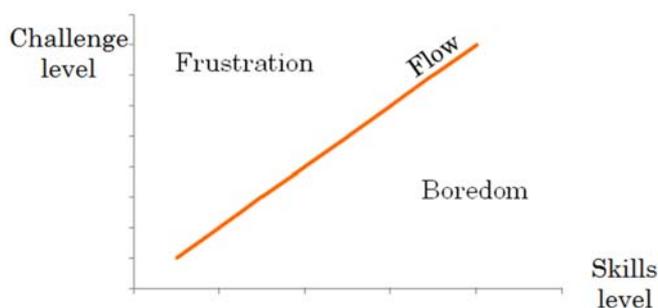
Source: Landowska (2016).

5. The **convenience** factor measures the influence of an emotion recognition application on e-learning processes. Environmental changes introduced by applying emotion recognition should not disturb or interfere with learning itself. Some emotion recognition techniques blend naturally into an e-learning environment, while others can significantly disturb a user. The scale for convenience used in this study is low–medium–high, where a higher score is better.

Experiment 1. Learning via playing educational game

The aim of this experiment was to investigate emotional states during learning using an educational game (Landowska & Miler, 2016, pp. 1631–1640). A game on IT project management, called GraPM, was chosen mainly due to the availability of the target group. The target group of the game is computer science students and study participants were recruited from this group. Full randomization of the participant selection was not possible (only volunteers took part in this study), and therefore the study was a quasi-experiment. The participants were asked to play a game several times and both their emotional state and educational outputs were measured. From the perspective of this study, the most important aspect is the type of emotion recognition channel used: facial expressions, self-report, and physiological signals. Details for the channel input data analysis for all three experiments are provided in section *Data processing and analysis methodology*.

Ten participants took part in a study and the recording sessions lasted for 40-90 minutes. The following conclusions regarding the applicability of emotion recognition from the channels to monitoring educational activities were found.

1. The observation channels were susceptible to disturbances. Facial expressions were susceptible to occlusions of the face (e.g., moustache, glasses, hand near the face, or atypical haircuts) and camera location. Physiological signals were disturbed by keyboard typing and other bodily movements.
2. The availability of observation channels for emotion recognition might be user-dependent – some of the participants did not want to have their facial expressions recorded. Moreover, some people draw their face closer to the screen when reading details (possibly due to sight problems), making a face only partially visible in the camera above the monitor.
3. The emotion recognition methods used provided estimates of emotional states, with diverse representation models and diverse accuracy. We decided to use multiple observation channels hoping to fuse them afterwards to achieve more accurate results. However, fusion was not possible due to the diversity in emotion representation models used by the solutions. Facial expression analysis software provided results that almost exclusively fall into Ekman's six

emotions model; the self-report used the most popular questionnaire, the Self-Assessment-Manikin, which provides a Pleasure-Arousal-Dominance model; and physiological signals provided information on arousal only.
4. The emotion elicitation techniques provided contradictory results. We compared the valence from facial expressions (mapped from Ekman's six basic emotions) to the self-report and compared the arousal obtained via physiological parameters with the self-report and found low correlation between all of these. Based on the experimental results, it was hard to determine which estimates were actually correct. Another issue is timing: the self-report is captured sporadically (between tasks), while other measurements are almost continuous (captured several to hundreds of times per second, independently of the task duration).

Experiment 2. Learning with a Moodle course

The aim of this experiment was to investigate emotional states while using a Moodle course with diverse activities. Three Moodle activity types were employed: watching a lecture (slide show with narration), completing a quiz, and adding a forum entry on a pre-defined subject. There were 10 participants recruited from computer science students; the course subject was "IT strategies".

The experiment design was modified according to the observations from the first experiment. One of the main changes was the simultaneous use of four cameras for recording facial expressions. The four cameras were used in order to overcome the challenge of a face moving out of the camera frame. Sentiment analysis of textual input was added as a new observation channel for this study. Self-report (between-task) and physiological measurements were also employed. The following conclusions regarding the applicability of emotion recognition from the channels to monitoring educational activities were found:

1. The availability of some emotion observation channels is task-dependent. For example, sentiment analysis depends on whether or not a task is writing-based. Moreover, the occurrence of facial expressions differs for passive versus active tasks. More mimicking activity is observed in passive tasks (e.g., watching a lecture) than for taking a quiz. According to our observations, the more a person is focused on a task, the fewer facial actions are observed.
2. A sentiment analysis of textual inputs should be based on free-text or opinion-like texts only (the textual inputs on a given subject in this experiment were usually neutral).
3. Physiological signals only provide information on the fluctuation of arousal and not on the valence of an emotional state. The differentiation of boredom and frustration based on physiology is weak – we might observe a participant's arousal rise due to positive emotions.

4. Self-report is the most dependent on human will and should be confirmed via another observation channel. Moreover, our observation is that there is no good timing for self-report: when disrupting the task, it influences the process we are monitoring. When self-report is used between tasks only, we might only get temporal information, which might not reflect the perception of the entire task.

5. The location of the camera is a crucial factor influencing recognized emotional states. There were observable discrepancies between the emotions recognized based on the data from each of the four cameras. As camera location in a learning environment is user-dependent, the observations made on the basis of facial expressions analysis must take that into account.

Experiment 3. Learning with online tutorials

The aim of this final experiment was to investigate emotional states while learning via watching video tutorials. Video tutorials, such as those published on YouTube, are a popular form of gaining knowledge on how to use specific tools, perform certain tasks, or even play games, especially among the younger generation (Landowska, Brodny, & Wróbel, 2017, pp. 383–389). We chose the tool Inkscape for the participants to learn, and three tutorials of varying difficulty were selected for the experiment. There were 23 participants and each session lasted for 40–90 minutes.

During the study, data were collected from the following observation channels: facial expression recordings (two cameras located below and above the monitor), sentiment analysis of opinion-like text, and self-report. Physiological signal measurement was not used. Another new observation channel was included: behavioral characteristics derived from keystroke dynamics and mouse movement patterns.

The main observations from the study regarding the observation channels include following:

1. The availability of camera recordings in an e-learning environment is acceptable; further, the upper camera (above monitor) availability is better than for the location below the monitor. Moreover, when one camera recording is unavailable, recording from the second one is usually available.

2. When using two cameras, the inconsistency of emotion recognition is relatively high. The lower camera tends to overestimate surprise, while the upper one tends to overestimate anger.

3. Opinion-like textual inputs are appropriate for sentiment analysis; however, opinions are usually close to neutral in experimental settings.

4. The peripheral (mouse, keyboard) usage patterns reveal information on affect of low granularity and accuracy, and should be combined with other observation channels.

Data processing and analysis methodology

The processing and analytical techniques depend mainly on the input channel used for emotion recognition. The data gathered from the experiments included the following:
- facial expressions (videos),
- textual inputs by users,
- self-reported emotional states (before/after task completion),
- behavioral data from peripheral usage,
- physiological data (skin conductance, blood-volume pulse, respiration).

The data were processed by algorithms that automatically recognize emotions based on the input channels. For facial expression analysis, we used three algorithms. Two of the algorithms are off-the-shelf solutions: Noldus FaceReader and QuantumLab Ellen. Another algorithm is a homemade solution based on neural networks and the Luxand library. The solutions provided a time-series of estimated emotional states represented by a vector of basic emotions, where each emotion was assigned a number between 0 and 1, indicating the recognized intensity of the emotion. Some algorithms provide additional data, like the angle of the face towards a camera, or recognized occlusions, while none provides an indication of the recognition confidence.

Textual inputs are analyzed using sentiment analysis algorithms. There are two solutions we analyzed the texts with:

1. a rule-based algorithm, that was designed for opinion-mining on learning activities and

2. a more general algorithm for sentiment analysis that is based on lexical analysis and a dictionary of affect-annotated words.

The first solution only works for opinions about learning activities, while the other solution might be used for mining sentiment in diverse textual inputs, but is also less accurate. The rule-based algorithm provides a set of phrases that were represented in the text, e.g., "interesting subject" or "helpful teacher". The more general algorithm provides a sentiment value of the sentence or a phrase based on words found in an affect-annotated dictionary; the result is provided in a representation model that the dictionary is annotated with. As textual inputs were provided in Polish, three Polish lexicons were used: NAWL, SentiD and ANPW.

As there is no "ground truth" for a person's emotional states, self-reported emotional states might be used as labels, and that approach was used in the analysis of the data from these experiments.

Peripheral usage was stored as a series of keystrokes and mouse movements and raw data had to be processed to more general metrics. The metric for using keyboard included the ones based on frequency of keystrokes and time-based metrics (e.g., flight time, delays). Mouse analysis requires a three-step analysis. First, the detailed data on separate movements and key presses is combined to form complex movements like "drag'n'drop". Then, the metrics are calculated for

discrete time periods, such as velocity or acceleration. Finally, the temporal metrics are analyzed using statistical descriptive metrics (min/max values, averages, standard deviations, etc.).

Raw physiological data recorded by Thought Technology coder were exported as time series files with a pre-defined frequency. The data were gathered using diverse frequency rates (16Hz-2kHz); while exporting them, the highest frequency rates were used (2kHz). The data were re-calculated using Biograph Infinity tool to reveal the heart rate from the blood-volume pulse and respiration rate via skin conductivity. The heart rate, respiration rate and skin conductance were analyzed, using a person-specific baseline in order to find changes in the signals that indicate a change in arousal. In most the cases, changes in the signal reflects a stimuli, but some peaks are hard to interpret.

All time series derived from diverse input channels were then analyzed using statistical approaches (descriptive statistics, correlation measures, and recognition methods based on machine learning, providing that labels are assignable).

Study results

The emotion recognition input channels were analyzed from the perspective of applicability in user experience evaluations, using the criteria defined in section *Emotion observation channels evaluation criteria.*

Availability

As availability differs depending on the context of the e-learning process, the following contexts were considered:

1. a user learning at home, in an asynchronous mode,
2. a learner taking part in a virtual classroom meeting,
3. learning in a computer lab at school/at university,
4. learning outside, via a mobile device;
5. monitoring e-learning processes in an experimental setting.

The experimental setting is the easiest way to monitor e-learning processes with emotion recognition channels, but, even in this context, the availability of some channels is dependent on the performed task. The availability of the channels in each context is summarized in Table 1. The last column contains the availability in an experimental setting, while the other columns contain an anticipated availability in diverse environments where e-learning might occur: at a home desk (asynchronous or synchronous learning), in a computer lab, or outside, using mobile devices (a ubiquitous learning model).

Self-reporting is always available, as a questionnaire on affect can be added anywhere within the learning path. The technique has drawbacks, which are discussed below. In any context, some of the techniques might be temporarily unavailable as they depend on which task is being currently performed. Most asynchronous learning activities happen in silence; therefore, speech analysis might be a difficult option to use. When performing passive tasks like listening or watching, sentiment analysis and peripherals usage patterns are also not available. There are also input channels, for which availability is user-dependent, i.e., facial expression analysis or speech prosody. A camera or microphone might be not available at the learner's home desk, their network throughput might be too limited to carry video signal, and the user has the right and ability to switch the camera/microphone off. Tracking of the peripheral devices should be, for ethical reasons, performed with informed consent, which implies unavailability in the case when the user does not give consent. There are studies on the perceived disturbance of observation channels and the level of disturbance depends significantly on the context of use, with higher disturbance levels found in home environments (Landowska & Brodny, 2017, pp. 26–41).

Physiological measurements are usually available in the controlled contexts of experimental settings. However, technological progress might solve this problem, as smart devices measuring physiological signals like heart rate or skin conductance are currently being developed and introduced into the market.

Table 1. Availability of emotion monitoring input channels in e-learning contexts

Emotion elicitation channel	Context				
	Home desk, asynchronous model	Home desk, virtual classroom	Computer laboratory	Mobile learning	Experimental setting
Self-report	AV	AV	AV	AV	AV
Facial expression analysis	UD	AV	AV	UD	AV
Peripherals usage patterns	TD, UD	TD, UD	TD	TD, UD	TD
Prosody of speech*	TD, UD	AV	TD	TD	TD
Sentiment analysis	TD	TD	TD	UN	TD
Physiological measurements	UN	UN	UN**	UN**	AV

(AV – available, TD – task-dependent availability, UD – user-dependent availability, UN – unavailable, * – channel not used in the experimental setting, ** – availability might change with upcoming technologies)
Source: own study.

In the experiments performed and reported in this study, the following emotion elicitation techniques were used: self-report, facial expression analysis, peripheral usage patterns, sentiment analysis and physiological measurements. Speech prosody was not analyzed, as there was no task where voice communication was employed.

While considering emotion elicitation techniques for a specific e-learning context, the availability of the observation channel is the first factor to consider. For example, in a design of the online educational game GraPM (Landowska & Miler, 2016, pp. 1631–1640), the only available emotion observation channel was the facial expression analysis. If more channels are available, other criteria may be considered.

Robustness, compatibility, independence and convenience

All emotion elicitation channels are susceptible to some disturbance that limits the practical applicability in an e-learning context, even though a channel is available. Applicability was distilled into robustness, compatibility, independence and convenience criteria, as defined in section *Emotion observation channels evaluation criteria*. A summary of the techniques comparison is provided in Table 2, while justification for the scores, based on observations from the experiments, follows.

Robustness to disturbance is high for self-report only – there are few sociological phenomena that might influence self-reported emotional states; however, for most e-learning contexts, the self-report is robust against disturbance. For the video channel, robustness is relatively low, as the channel suffers from insufficient or uneven illumination conditions and face occlusions (facial hair, atypical haircuts, glasses, or even a hand near the face), which are typical conditions for a user learning at home. In the first experiment, emotion recognition from facial expressions was available on average 77% of the time (measured by the number of frames for which emotion recognition was available against the total number of frames), with variations among users from 42% to 100% availability. In the second experiment, the average availability reached 89% of the time, with variation among participants from 59% to 99% of the time. In

the third experiment, the availability was higher with an average of 84% of the time and variability of 43–98% (depending on the user). The availability was enhanced with the use of two cameras in the third experiment and four cameras in the second experiment.

Peripheral usage patterns, which were used as an emotion elicitation technique in the third experiment, were significantly task-dependent. They might be used for comparing emotional states within the same task; however, comparison among tasks is difficult. As both mouse movements and keystrokes are analyzed, the recognition results suffer from the temporal unavailability of one of the input types. In the first experiment, which was based on a game, keyboard data were unavailable, as users mainly used the mouse for controlling the game. In the second experiment, which was based on a Moodle course, the passive activities (watching and listening) did not provide any keyboard/mouse entries, whereas the active parts of the course mainly provided mouse patterns. Due to the missing keyboard entries, the analysis of peripheral usage patterns was limited. Moreover, another complication might be imposed, while using this type of analysis at a learner's home desk – the patterns are dependent on keyboard and mouse types, and therefore comparability among participants might be limited.

Sentiment analysis is available for text-based tasks. However, only free-text inputs should be analyzed, as topical answers rarely reveal sentiment. In the third experiment, the user was periodically asked to input an opinion into a text field of a certain length and the results were inconclusive. Spontaneous entries, for example in online forums, might reveal more information on sentiment.

Physiological measurements, which were used in the first and second experiments, are easily disturbed, as most of the sensors are located on the fingers, sometimes even on the finger tips. In an e-learning context, the learner is using a computer or another device, which operated by hand; therefore, typing and hand gestures introduce significant disturbance to measuring physiological signals.

Compatibility represents a factor of match between the emotional states under investigation and the emotional states usually provided by emotion recognition tools. If state of flow is to be detected, no emotion elici-

Table 2. Emotion monitoring input channels in e-learning contexts – comparison (high–medium–low scale was used with the higher value indicating better applicability in an e-learning context)

Emotion exploration technique	Robustness to disturbances	Compatibility with e-learning	Independence on human will	Convenience in e-learning
Self-report	High	Medium	Low	Medium
Facial expression analysis	Low	Low	Medium	High
Peripherals usage patterns	Medium	Medium	High	High
Speech prosody*	Low	High	High	Medium
Sentiment analysis	Medium	Medium	Low	High
Physiological measurements	Low	High	High	Low

Source: own study.

tation technique can directly provide such an output. Some of the input channels might reveal information about arousal (physiology, prosody), which might be a good differentiator between boredom and frustration. Some information on arousal might be derived from peripheral usage pattern and sentiment analysis. The boredom and frustration states might be also asked directly in a self-report. Well-established questionnaires for emotion retrieval (e.g., the Self-Assessment Manikin [Bailenson et al., 2008, pp. 303–317]) or adjective lists (Strapparava & Valitutti, 2004, pp. 1083–1086) are only partially transferrable to a boredom-frustration model. Emotion recognition from facial expression analysis is usually based on the FACS model and provides output as a combination of six basic emotions (joy, anger, disgust, sadness, surprise, and fear) and a neutral state. The emotion representation model is incompatible with the one required in e-learning, as it is hard to represent boredom with Ekman's six basic emotions. In the experiments, facial expression analysis was used, but a mapping to valence-arousal model had to be applied, adding an additional factor of mapping accuracy to overall uncertainty about the recognized emotional state.

Independence on human will is another factor that should be taken into account when choosing an emotion elicitation technique. People behave differently when they know they are being observed, and that fact might influence the emotion elicitation results. The channels that are highly controllable by humans include self-reported states and textual inputs. Facial expressions are to some extent controlled and might be intentionally falsified. The channels that are hard to control by an individual include physiological measurements, prosody, and peripheral usage patterns. If an emotion elicitation channel is susceptible to intentional or unintentional falsification, an advisable approach, which was applied in the experiments, is to use more than one observation channel, including the ones that are less dependent on human will.

Last but not least, the **convenience** factor measures the influence of emotion recognition application on e-learning processes. Some emotion recognition techniques blend naturally into an e-learning environment, especially when using a computer setting: peripheral usage patterns, facial expression analysis and sentiment analysis are among the most convenient approaches. A word of warning must be given about the self-report, which is only partially natural and might interrupt a state of flow, if timing is not carefully considered. Imagine any system asking for an emotional state every minute – the focus and concentration on an educational task would be constantly interrupted. On the other hand, if an emotional state is reported in large time intervals (e.g., once every few hours), it might not reflect the emotions occurring during the entire period, just last (best remembered) time. In our experiments, emotions were reported after each task, and the interval depended on task duration as well as user efficiency. As a result, the time interval between consecutive self-reports varied from 5 minutes to over an hour.

This limitation is hard to overcome in an e-learning context and priority should be given to educational task efficiency over emotion elicitation precision.

For virtual classrooms (synchronous learning using an audio channel), prosody analysis might be convenient. Physiological measurements are usually incompatible with the e-learning process of using a computer, as sensors might disturb the user while they operate a keyboard, mouse or touch screen.

Summary of lessons learned and discussion

The results of the experiment analysis are summarized with the following statements:

- Multiple observation channels can be used in monitoring e-learning processes: self-reported states, facial expression analysis, peripheral usage patterns, prosody, sentiment analysis, and physiological measurements; the main criteria remains availability in a specific setting.
- There is no best method for emotion elicitation in an e-learning context. The channels that are available have other drawbacks (e.g., limited robustness to disturbance, or low compatibility of the output model of emotions).
- The availability of input channels that can be used in emotion recognition is often limited and also task- and user-dependent.
- The choice of observation channels for monitoring e-learning processes should be based on following criteria: tasks to be performed, setting for observation (available equipment), required additional consent for affect recognition, and robustness to disturbance.
- The self-report, although always available, is the most subjective channel and should be supported with another observation channel for credibility.
- Priority should be given to the efficiency of the e-learning process and not to monitoring activities. Therefore, the observation should be as unobtrusive as possible, making convenience an important matter to consider.

Based on our experience, it is possible to monitor educational processes with affective computing methods. This study revealed the advantages and disadvantages of emotion observation channels from the perspective of their usefulness in monitoring educational processes. A practical implication of the study is that the selection of observation channels should be tailored to what is needed (what processes are monitored, what emotions are fostering or suppressive), what channels are available (whether the availability depends on the user and task) and whether observation will affect the observed process (this factor is often overlooked in planning). An analysis of the literature shows that a single channel of observation is usually used, without much reflection on its limitations. Having a tool for analyzing emotions from facial expressions does not mean that the data received from

it will be valuable for the purpose of the study. While applying automatic emotion recognition in e-learning, one must be aware of the limitations of the methods that are currently available.

We are aware of the fact that the presented study has some drawbacks. The experiments are not reported in detail, as two of them were previously reported (Landowska & Miler, 2016; Landowska, Brodny, & Wróbel, 2017), although in different context. This paper summarizes the lessons learned while applying automatic emotion recognition to monitoring e-learning processes, rather than reporting detailed data. The assignment of labels related to certain criteria (apart from robustness) is subjective and based on our experience. Moreover, not all observation channels were applied in all three experiments – e.g., prosody was not used, as there was no speaking activity within the educational process being monitored. The channel has been included in the analysis, as it might be used; however, the criteria for that channel were evaluated by anticipation rather than experimental results.

Conclusion

Teachers know well that emotions are a crucial component of successful education. There are learners who, despite high intelligence and potential, fail in accomplishing their learning activities. Goleman (2006) proposed the term 'emotional intelligence' to name a phenomena of affect influence on human effectiveness in life. Self-sustainability and motivation play a crucial role in accomplishing e-learning activities. The presented experiments allowed us to apply multiple observation channels in monitoring affect during e-learning activities. An affective analysis of a learning process might be used in observing the quality of educational design in systems and resources. Moreover, online analysis, provided to an online tutor might help him or her to address the fluctuation of motivation and concentration in learners. The emotion recognition techniques are applicable to e-learning; however one should be aware of the limitations of these techniques. We are planning more experiments to monitor synchronous activities.

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Investigation of educational processes with affective computing methods

This paper concerns the monitoring of educational processes with the use of new technologies for the recognition of human emotions. This paper summarizes results from three experiments, aimed at the validation of applying emotion recognition to e-learning. An analysis of the experiments' executions provides an evaluation of the emotion elicitation methods used to monitor learners. The comparison of affect recognition algorithms was based on the criteria of availability, accuracy, robustness to disturbance, and interference with the e-learning process. The lessons learned in these experiments might be of interest to teachers and e-learning tutors, as well as to those researchers who want to use affective computing methods in monitoring educational processes.

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Student Authored Video Vignettes in Chemistry

Layne A. Morsch

Video has had a profound impact on education in general, and on chemical education specifically. Many faculty members have found the ability to post video lecture material for students a valuable tool in fostering more interactive and dynamic learning in face-to-face classes (Read & Lancaster, 2012, pp. 13–16) or in improving student laboratory techniques (DeMeo, 2001, pp. 373–379). Many reviews of video lectures have been published across higher education fields (Kay, 2012, pp. 820–831; McGarr, 2009, pp. 309–321; O'Callaghan et. al., 2017, pp. 399–415). The video lecture has become the centerpiece of most flipped learning classes (DeLozier & Rhodes, 2017, pp. 141–151). There is great variety in the delivery of video lectures; in reviewing video lectures from 50 different online courses, Crook and Schofield (2017, pp. 56–64) found 16 different styles of presentation.

Background

Recently, there has been interest in engaging students in the video creation process. This encourages students to understand course content thoroughly in order to be able to explain it to others. Student-authored video assignments have been reported in a variety of higher education courses. For example, composition courses have been designed to integrate video with more typical writing assignments in order to develop the ability to express oneself across multiple modalities (Baepler & Reynolds, 2014, pp. 122–136). Student-generated course videos were used in a nursing curriculum to improve curricular as well as cross-curricular competencies (Pereira et. al., 2014, pp. 580–590). In organic chemistry lab courses, students have been asked to prepare video demonstrations of laboratory techniques before attending the lab (Jordan et. al., 2016, pp. 141–145) or to improve general chemistry lab skills by creating a similar technique video (Erdmann & March, 2014, pp. 650–657). Digital badges, based on videos of students engaging in laboratory skills, have been incorporated into introductory laboratories to assess student learning (Hensiek et. al., 2016, pp. 1847–1854; Hensiek et. al., 2017, pp. 28–33). Biochemistry students have been challenged to develop videos in groups to explain a biochemical area of interest (Ryan, 2013, pp. 24–41). Video vignettes have been used in a summary fashion, integrating material from a series of courses in a Master's level program (Lancaster, 2014; The Chemistry Vignettes Website).

The process of creating student-authored video assignments that would encourage students to engage with complicated course material, and that would be useful for enhancing chemistry and communication skills, requires an iterative process. Incorporating new types of assignments can be challenging for many professors, as most do not have explicit training in education or curriculum development. This iterative process is described below, to demonstrate that incorporating new technologies into course assignments may reveal some unexpected challenges. However, with thoughtful reflection, a valuable assignment can be molded.

Minimizing Technological Learning Curve

Camtasia Studio (Windows) and iMovie (Mac) were used for video recording and editing over 130 videos to prepare organic chemistry courses for a flipped learning format. While each of these video-editing programs is quite powerful, they were each deemed to have a significant learning curve for competency in their use. The students taking organic chemistry 1 and 2 at the University of Illinois Springfield (UIS) were all required to have iPad devices. (Due to the potential additional cost for students that did not already have access to an iPad, LibreText, a free open educational resource, was used in place of a traditional textbook.) The iPad provided each student with the capacity to engage with video authoring active learning assignments. Apps that would allow the students to generate video vignettes on the iPad were explored.

Three apps were eventually selected to record and edit the videos:
- Adobe Spark Video (originally called Adobe Voice),
- Explain Everything,
- iMovie (iPad app version).

Each app has its advantages, depending on the video content being created. Adobe Spark Video is the simplest to use. It allows importing of images (which could be created with ChemDraw or other chemical structure drawing software) into each "slide". Then one can record one's voice narrating the information relating to that picture. By repeating this procedure, a movie is generated with a series of images and explanations. There is also a pre-defined set of musical backgrounds that can be added to the presentation for aesthetic effect. The entire set of narrated slides with music can be exported as a video, once complete. The limitation of Adobe Spark Video (Figure 1) is that

Figure 1. Sample Adobe Spark Video vignette

Source: https://www.youtube.com/watch?v=OC11FsVQYwk&list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i&index=9

Figure 2. Sample Explain Everything vignette

Source: https://www.youtube.com/watch?v=nJnHGyM1S9c&index=8&list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i&t=1s

Figure 3. Sample vignette using iMovie to integrate Adobe Spark Video and Explain Everything
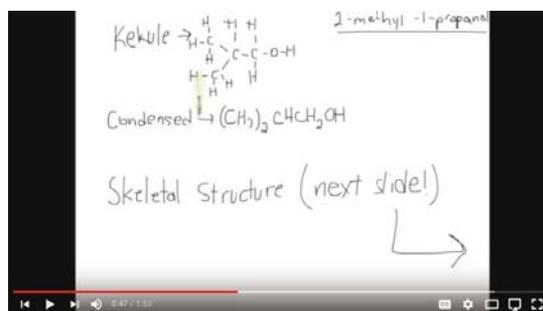
Source: https://www.youtube.com/watch?v=Gf5Y80uGe9M&index=7&list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i

it does not allow for real-time recording of drawing or showing of motion, which is often required to explain organic chemistry topics (such as mechanisms or resonance).

Examples of video vignettes created by UIS undergraduate students can be found on the YouTube Channel – Video Vignettes for Organic Chemistry https://www.youtube.com/playlist?list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i.

Explain Everything is a much more versatile app (Figure 2), which allows for recording drawing and narration simultaneously. It also allows for the importing of images; each image can then be arranged on a page and drawn on during the video recording. Similar to Adobe Spark Video, each "slide" allows the recording of audio relating to that slide and, upon completion of the project, the entire set of slides can be exported as a video. Due to the broad capability of this app and the improved drawing capability that appeared with the release of the iPad Pro and Apple Pencil, I replaced my previous Camtasia Studio setup with Explain Everything on an iPad Pro for my own lecture videos.

iMovie was introduced to help students that wanted to incorporate both the Adobe Spark Video and Explain Everything apps into a single video (Figure 3). (However, it was later determined that merging of videos could be accomplished within Explain Everything, without the use of a third app.) Within iMovie, a project could be started and each of the previously exported videos from other apps could be imported, arranged, edited and then exported as a single video.

Student Information

The video vignettes assignment was introduced in organic chemistry 1 classes (fall and summer) and organic chemistry 2 classes (spring) at UIS. The class sizes range from 18-24 in the summer to 60–65 in the fall. The students are a mixture of biology, chemistry, and clinical lab science majors, with a few that are planning post graduate study in the health sciences but are in a non-science major. The course is a second year course in the chemistry curriculum, but many students in other majors take the course later in their college careers.

Morphing of an Assignment

What follows is an iterative examination of the video vignette assignment as it was modified based on instructor reflection and student feedback. Unlike many manuscripts, bad ideas and problematic aspects of the assignment have been included purposefully to illustrate this process.

Fall 2014
#Videos assigned: 1
Video length: 5–10 minutes
Points for videos/points in class: 25/630

I gave the first student-authored video vignette assignment in my organic chemistry 1 course, during Fall semester of 2014. A list of all course topics was given to the class. Each student was asked to work in a group of three students to create a video on one topic chosen from the list. The groups were randomly selected and assigned. In order to get a wide variety of content videos, each subject could be chosen by only one group, with the first group selecting the topic given priority. The videos were expected to be between 5–10 minutes long and to include examples of how the concept can be applied to problem solving. Following completion of a first draft of the video, each group peer reviewed two other group videos and gave feedback to the authors. Then the groups were allowed to edit their original video to make a final draft video for grading by the instructor. A rubric was included, which explained the criteria that the projects would be graded on. As grading of the final drafts was undertaken, a glaring omission in the criteria appeared. There were points for whether the material was easy to follow, well structured, thoroughly explained and at the appropriate level. However, there were no points assigned for the chemistry actually being accurate (Figure 4).

What Worked Well: The students adapted to the technology easily. The students were able to make presentations about chemistry without using class time.

What Needed Improvement: The students mostly focused on the simplest material. The videos were too long. The rubric did not reward students for having accurate chemical information.

Spring 2015
#Videos assigned: 3
Video length: 5–10 minutes
Points for videos/points in class: 70/670

Groups of students were assigned. They were asked to create two videos as a group and one video individually. This time, the topics were limited to topics that were covered on each of the three exams during the course (not including the final exam). Each video was due before the corresponding exam, so that creating the video could serve as a study aid. As with the previous course, they completed both a rough draft and a final draft, with student reviews of the videos designed to give feedback for the groups or individuals to improve their final drafts. Content accuracy was now included and comprised half the points for the final draft. This replaced other criteria, including "material was easy to follow", "graphics enhanced understanding of material", and "spelling and grammar correct". While grading the Fall 2014 videos, there had been no significant issues relating to these concepts. Student surveys were given at the completion of the assignment.

Figure 4. First video vignette rubric

CHE 267 Video Vignette Project Grade   Student_____
Fall 2014

Instructor Evaluation:

Criteria	Points Possible	Points
Initial Draft – complete and on time	5	
Review -1	2.5	
Review -2	2.5	
Description of changes after review	2	
Audio was clear and understandable	1	
Images/graphics were clear	1	
Images/graphics enhanced understanding of material	1	
The material was easy to follow	2	
The presentation was well structured	2	
The material was thoroughly explained	2	
The level was appropriate for CHE 267 students	1	
The examples were helpful and related to main point	2	
Spelling and grammar correct	1	
Total	**25**	

Source: Author's research.

Based on student responses and the videos submitted, the nature and value of the video assignment was reviewed. Many students complained that the groups didn't function well and that some partners were not contributing to the assignment. While this was partially addressed with reduced grades for the non-contributing partners, it did not encourage all students to take advantage of this assignment to improve their understanding of relevant chemical principles. It was also evident that most groups tried to choose the simplest possible concepts for their video. This thwarted the idea that having to explain difficult concepts will help students improve their understanding of organic chemistry. The students responded when surveyed that they didn't feel that they learned very much from watching and reviewing the peer videos. The learning objectives of the assignment were also reflected on and the creation of a final draft video seemed to be more about video production skills than about learning chemistry content and using verbal and symbolic language to explain it to others.

What Worked Well: Points focused on accurate chemical information.

What Needed Improvement: Multiple drafts focused on non-chemistry learning. Reviewing other students' videos was not a time effective learning tool. Groups were not effective in encouraging all students to learn from authoring the videos. The simplest concepts were often selected for the videos.

Summer 2015
#Videos assigned: 3
Video length: 2–3 minutes
Points for videos/points in class: 30/470

Based on lessons learned through the first two semesters of employing video vignettes, this semester each student was asked to create three individual videos. During summer, this course includes two exams and a final exam. Students were required to select each video topic from a list of course concepts that would be covered on the corresponding class exam. The video was due before the corresponding exam, so that creating the video could aid students in preparing for the exam. Final drafts were eliminated based on the previous analysis of learning objectives; I graded each video was graded without the use of student reviews. Since students had more videos to create, the time for each video was reduced from 5–10 minutes to 2–3 minutes per video. Students were given an additional instruction on choosing a topic:

Most important!! – Choose a topic that you don't understand well. Working on these videos will require you to learn more about the topics you choose.

I explained to the students that selecting a topic that is already well understood will be a waste of their time. The value in the assignment comes in having to learn an unfamiliar topic well enough to explain it to others. This was the most successful assignment yet,

according to the student responses on whether creating videos aided in their learning. A new idea began to dawn in my mind regarding the potential increased learning that could happen if students had to explain more ideas from the course.

What Worked Well: Individual videos, single drafts, eliminating peer review and shorter videos were all successfully implemented.

What Needed Improvement: There were only three videos while the course covered 13 chapters.

Fall 2015
#Videos assigned: 13
Video length: 1–2 minutes
Points for videos/points in class: 50/600

My experience from this semester should serve as a warning: do not get carried away with a good idea. As I prepared for the Fall semester, I decided that if students in a shortened summer class could learn three concepts from organic chemistry really well, by creating three videos, wouldn't it be great if each student learned one concept really well from each of the 13 chapters covered in the course. The assignment this semester was to create one video per student per chapter, or 13 videos each. As this would result in ~780 student-authored videos during the semester, a grading scheme based on discussions with several K-12 teacher-colleagues was developed. The first video from each student was graded to make sure all students had feedback letting them know if they were successfully meeting the requirements. Then three of the remaining 12 videos authored by each student were randomly selected for grading. iTunes U was used to deliver the course materials and assignments. Even before the end of the term, the difficulties this assignment was causing the students became evident. Before registration for organic chemistry 2 opened, I decided not to have students create one video per chapter again. Not only was it causing the students to spend too much time with the technology, it was a logistical nightmare for the instructor.

What Worked Well: Clear rubric (Figure 5) and short videos.

What Needed Improvement: The number of videos was unmanageable, both for student authoring and faculty grading.

Spring 2016
#Videos assigned: 4
Video length: 1–2 minutes
Points for videos/points in class: 40/640

This semester began by returning to the Summer 2015 version of the assignment, since that had been the most successful version of this video vignettes experiment so far. The only difference from summer is inclusion of an extra exam, so there were four videos as opposed to three. However, about halfway through the term another idea was sparked. While I

Figure 5. Updated rubric for video vignettes assignment

Assignment: Video Vignettes using Explain Everything

Scoring:

| Criteria	Points
Chemistry content is accurate	5
Audio/Images clear and understandable	1
Introduction	1
Conclusion	1
The video fit into 1-2 minutes	1
Presentation is clear and focused	1
Total	10

Source: Author's research.

was at a conference, there was a discussion on having students create crowd-sourced course materials for a Bioorganic chemistry class (Tartaro et. al., 2015, pp. 221–224). At the same time, the students in organic chemistry courses at UIS were requesting

Figure 6. Sample vignette with a solution to a problem:

https://www.youtube.com/watch?v=Rqu8u8Lo5uw&index=23&list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i
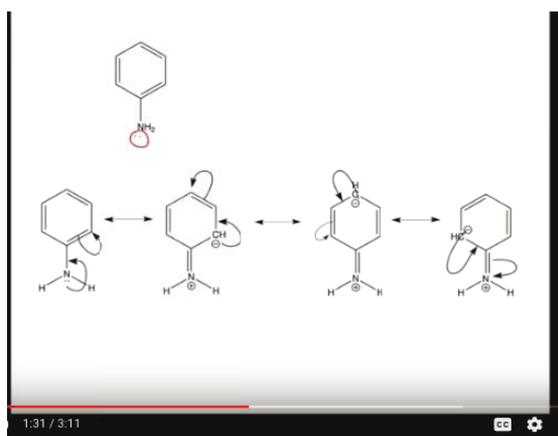
Source: Author's research.

more problems to work on outside of class. Since LibreText had been used as the course textbook for the last few semesters, the students didn't have any publisher-provided homework system that they were forced to purchase. They only had the few problems per section that were integrated into LibreText at that time. I developed some problems, with video solutions, but due to the time-consuming nature of such an endeavor, they were not available for every chapter. The solution was to begin using the video vignettes assignment as a crowd-sourced homework problem generator (Figure 6), with video solutions. The pedagogical advantage of having the students create these problem-based videos was that the videos were now forcing them to engage with the material in the same way they would on the exam (for the symbolic aspect of drawing out solutions), with the added feature of requiring them to understand concepts well enough to explain them verbally as well (Figure 7).

What Worked Well: Beginning to shift video assignment to exam type problems with video solutions.

What Needed Improvement: Consistency of the assignment. The focus was changed for the last two videos to the new problem-based idea.

Figure 7. Rubric for problem-based video vignettes

Assignment: Video Vignettes using Explain Everything
Scoring:

Criteria	Points
Chemistry content is accurate	7
Question submitted as image or pdf	1
The concept selected was narrow enough to be explained well	1
The video was focused on solving the problem stated	1
Total	10

Source: Author's research.

Summer 2016
#Videos assigned: 3
Video length: 1–2 minutes
Points for videos/points in class: 30/470

During Summer 2016, I continued the system of one video per exam. The spring modification of having one video per exam, where the video was a solution to a problem type that would be found on the exam, was carried through the summer organic chemistry 1 course. The previous type of video vignette that merely explained a topic was discontinued.

What Worked Well: The solutions to relevant organic chemistry problems, similar to exam questions.

What Needed Improvement: There were some complicated problems students were attempting to answer that required videos longer than 2 minutes.

Fall 2016
There was no video vignette assignment during organic chemistry lecture for Fall 2016 due to the introduction of a new technology-based assignment. To avoid technology overload, which could limit the time spent learning organic chemistry concepts, the video vignette assignment was reserved for the following semester.

Spring 2017
#Videos assigned: 4
Video length: under 3 minutes
Points for videos/points in class: 40/640

Spring 2017 was an opportunity to return to the video vignette assignments. I decided to repeat the design used during Summer 2016, with students submitting problems with video solutions. The students submitted one video per exam, which means four videos for a non-summer course. After considering all the previous iterations of the assignment, this version was determined to offer the best exam preparation for students, as they were asked to practice explaining exam-type problems before taking an exam on related material.

Data
Students were surveyed throughout the 2015-16 academic year. This included two sections of organic chemistry 1 and one section of organic chemistry 2, with a total of 124 students responding. The surveys were delivered online via Qualtrics. Most students found the additional technology easy to use and very few struggled with the apps (Figure 8). They found iMovie on the iPad a bit more difficult to use than the other apps. This encouraged a shift to finding ways to use Explain Everything for all videos, which is the current technology being used.

In the surveys, students were asked to rate the value of different aspects of the class, including the video vignettes. As mentioned above, the students perceived that watching other groups' videos was less valuable for learning overall (Figure 9). Students claimed to have not learned anything, which prompted an addition to the instructions given. I challenged the students to select a topic that they did not fully understand, so that the video creation process would force them to further explore the material for deeper understanding. Taking this into consideration, the student responses showed that over 60% of the class felt that the assignment provided at least moderate learning. The bulk of the course instruction focused on 60–70 video lectures and active learning/problem solving sessions during each class meeting; the four videos the students created supplemented these primary learning tools. Over 80% of the students rated the lecture videos and in-class problem solving sessions as "learned a lot" or "learned the most".

Figure 8. Percentage of student responses to "Ease of use of class materials" for Fall 2015 through Summer 2016
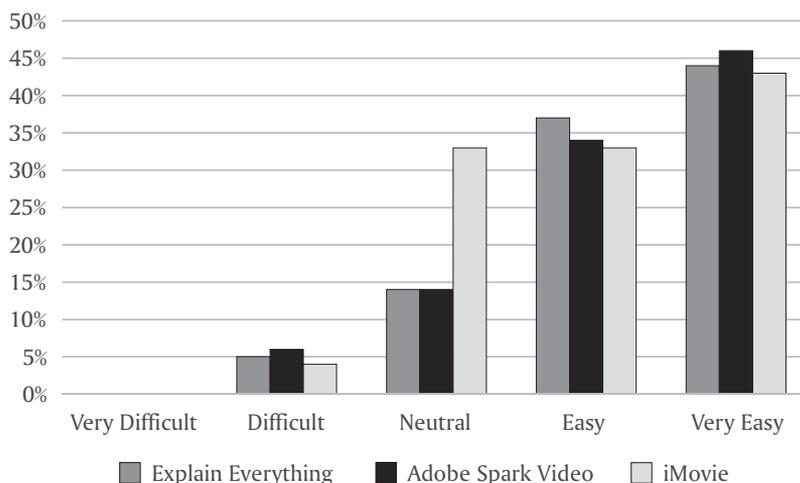
Source: Author's research.

Figure 9. Percentage of student responses to questions: *How much did you learn from making Video Vignettes? (2015 through 2016)* and *How much did you learn from watching/commenting on other group videos? (2015).*
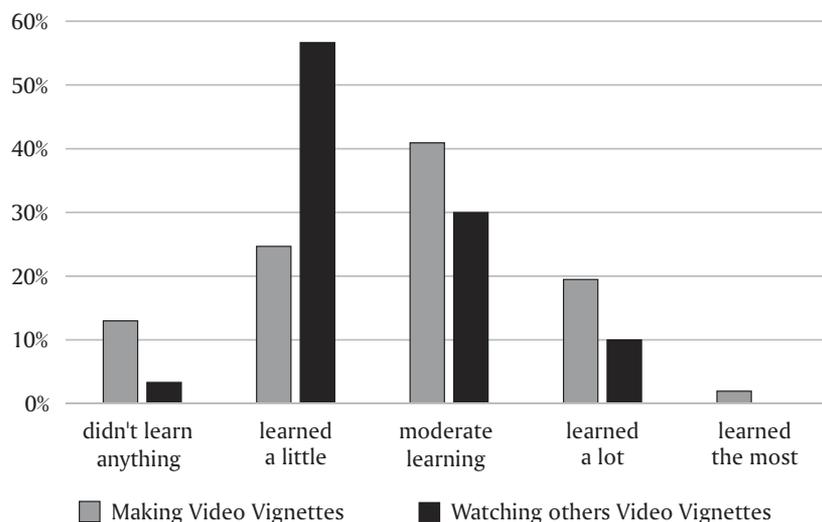
Source: Author's research.

Conclusions

Incorporating video vignettes into organic chemistry has allowed the practice of student presentation skills to be included in course assignments, without requiring large amounts of class time. Students adapted quickly to the technology-based assignments, especially when they worked on them individually, rather than in groups. This was evidenced in the ratings of the ease of use for each of the video apps. The majority of students surveyed reported performing better on exam questions on their chosen video vignette topics. They also reported learning more from creating their own videos than from peer review of other student videos.

The rubric for the assignment was modified as the assignment changed, with each of the final two rubrics seen in Figures 5 and 7 working well, based on the assignment type. The rubric in Figure 5 focused on important features when explaining a topic, including an appropriate introduction and conclusion. The problem-based rubric in Figure 7 focuses primarily on correct chemistry when explaining the solution to an organic chemistry problem.

Several of the assignments were effective in meeting the goal of incorporating presentations into organic chemistry, where students are required to explain chemistry using words and symbolic representations. Ultimately, having students solve exam style questions—while showing they understand the chemistry behind the solution well enough to explain their reasoning verbally—seems to be the most valuable use of the video vignette assignment.

This iterative process of instructional design led to a valuable assignment that might otherwise have been abandoned early in the process, if I had not taken the opportunity to reflect on what was working well and what could be improved. The inclusion of mistakes and non-optimal choices made during the process will hopefully be informative for others as they endeavor to create their own novel course assignments.

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Student Authored Video Vignettes in Chemistry

Access to video authoring tools has transformed many classrooms, from K-12 to higher education. The concept of flipped learning is one result of this. Much of flipped learning focuses on changes to the lecture component of a course. This paper applies similar concepts to classroom oral presentations. Classroom presentations have long been a valuable tool for encouraging students to engage in deeper learning, as well as practicing disciplinary language skills. Building on reports from other faculty who have used student-authored videos in classes where each student was required to have an iPad, a set of assignments was created. Reflections and attitudes of students relating to the assignment and their own learning were collected through class surveys. The survey results and instructor reflection on improving the assignment is discussed.

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ICT goes university. Three ideas and their implementations

Anna Turula

University education can truly be called up-to-date as long as there is coherence between the novelty of the technologies used and the modernity of the teaching philosophy, methods and techniques applied (Turula, 2014, pp. 45–63). This coherence can be best understood if we assume a non-reductionist approach to the mutual influences between technology and education (Turula, 2014, pp. 45–63, 2016, pp. 47–60).

Operating online in the digital world with its interconnections and flattened hierarchies, we should teach in ways that result in knowledge constructed in dialogue rather than transmitted from the teacher to the students. This implies education that is democratic (the hierarchies are flattened) and open (the walls of the university are thin; cf. Richardson & Mancabelli, 2011). At the same time it is important to emphasize that this influence of the digital (the interconnected world) on the educational is far from unidirectional. Dialogic education of unprecedented proportions and outreach capacity is possible owing to new technologies. Yet, at the same time, the teaching philosophy shapes the ICT context, by making us choose the environments and tools that best suit our pedagogical aims. Such shaping often goes beyond the mere choice of pedagogical means. The influence pedagogy exerts on new tech goes as far as the creative adaptation of available applications and their innovative affordancing. All in all, new technology and pedagogy should form a symbiotic relationship, ongoing and dynamic, adapting to the changing reality through the different facets of their mutual influence.

The three pedagogical solutions described in this article – blended tutoring, online intercultural exchanges and the flipped classroom – capitalize on the symbiosis between pedagogy and new technologies. The cornerstone of each is the previously mentioned belief that education should be dialogic and result in meaning construction rather than transmission. It should also make the walls of the university thin in the way described above, without time or place constraints, enabling encounters with people from different cultural backgrounds. Education of this kind should be carried out in a climate of trust, encouraging a free exchange of ideas and promoting critical thinking. This model of learning is called a community of inquiry (CoI) (Garrison et al., 1999), and rests on three different presences: the social (climate), the cognitive (critical thinking) and the teaching (efforts of the educator aimed insuring the first two presences). All three pedagogical solutions described aim at establishing such a CoI.

Firstly, these solutions stem from the assumption that while learning from and with other people, we need to intersperse *together* moments with *alone* moments. During the former, we bounce ideas off of other people and we have a kind of viewpoint rehearsal: we defend and maintain – or change – our opinions based on the lessons learned in ways much more complex and richer than when studying on our own. We also practice our discussion skills. When on our own, we have the time and the opportunity to reflect and to consult the relevant literature and other resources.

Secondly and equally importantly, the three pedagogical solutions presented are based on a conviction that learning should be facilitated as well as difficilitated. This means that while the role of the teacher is mainly about creating an environment that stimulates cognitive and social activities, it is also important that s/he plans tasks in a way that challenges the learners and pushes them out of their intellectual comfort zone. To fall back on the classics, this means the Socratic method, combining maieutics with elenctics.

The effective functioning of a modern CoI is reinforced by the use of new technologies. These technologies allow dialogue to cross various boundaries, by removing time and place constraints. They smoothly combine *together* and *alone* moments, by offering both CMC (computer mediated communication) and ACMC (asynchronous computer mediated communication) options, as well as by giving unlimited access to various resources. And finally, these technologies individualize education in ways unavailable to traditional schooling. As demonstrated in this article, the three pedagogical solutions described lead to the establishment of a CoI by using new technologies to offer dialogic learning, facilitated and difficilitated, and to interweave the collaborative with the individual.

Blended tutoring: Introduction

In its classic Oxbridge form, which is used as a model here, tutoring[1] boils down to an individualized academic education, based on a series of essays the student writes and discusses with their tutor during one-on-one, face-to-face (f2f) meetings. It aims to educate students by challenging them to evaluate sources and make connections across themes and disciplines (Moore, 1968), think critically and independently (Palfreyman, 2002), and express their opinions confidently (Beck, 2007, pp. 13–17). As the author of this article argues in another publication (Turula, 2017), the critical thinking and courage required to argue one's point are best developed if the traditional mode is reinforced by new technologies. If blended, modes lend their particular strengths to the task while also compensating for other modes' weaknesses. F2f meetings are better at promoting the social presence of the tutor/tutee's CoI: direct contact generates more spontaneous interaction and creates a climate in which attentive listening and verbal and non-verbal feedback are common. This aligns with earlier research showing that social presence – of both the tutor and tutee – benefits from communicative immediacy (Garrison, 2011) and interpersonal relationships (Vaughan, Cleveland-Innes, & Garrison, 2013). On the other hand, cognitive presence appears to be more intense online, probably owing to the asynchronicity of interaction (Garrison, 2011).

Blended tutoring, like traditional tutoring, requires a preparatory phase in which the foundations of a micro-CoI are laid. The phase starts by the tutor getting to know the tutee's interests, both personal and academic, to mark the social presence of both the teacher and the student and to delineate the path along which the tutorials will proceed. This is best done in a conversation that takes place during a meeting between the tutor and the tutee. This traditional mode can be digitally enhanced: the student may be asked to blog, to record a short introductory video (with the use of *Mailvu*, *present.me* or another application), or to create an online portfolio (e.g., in *Mahara*), in order to present themselves to the teacher.

Based on what is shared – and learned – in the course of these pre-tutoring actions, the tutor prepares a plan of action. This instructional design may follow the ADDIE model, where all sessions are planned ahead, executed and only then reflected upon. In such a case, rubrics – such as the ones devised by one of Poland's chief proponent of tutoring, *Collegium Vratislaviense* (Table 1) – may be a good solution.

If the tutor opts for a more *agile* way of instructional design, the rubrics may be filled as the individual tutorials proceed, not only with the topic of each essay but also with the reading list or general direction of the instruction chosen, based on negotiation between the parties involved. These negotiations can take place between meetings, in an *ad hoc* way, via email, or with the use of one of a wide number of digital tools normally used for brainstorming/stormwriting, storing, discussing and evaluating ideas (using *Padlet*, *Dotstorming*, *Conceptboard*, *Google Drive*, etc.).

Once it is clear what general topic an individual series of tutorials will revolve around, the student may start their work on the first essay; work, which – when in progress – is independent of the tutor. This is why it is important to make sure beforehand that the student is sufficiently developed in the area of search and information literacies. If necessary – based on what needs in this area we diagnose – a number of steps may be taken in the following:

Table 1. Tutoring rubrics

Tutor (name)			
Tutee (name)			
Area of knowledge			
Number and frequency of meetings			
Planned effects (knowledge)			
Planned effects (skills)			
Planned effects (attitudes)			
Reading list			
Tutorial 1	Outline of tutorial	Main questions	Topic of next essay
Tutorial …	Outline of tutorial	Main questions	Topic of next essay
Notes			

Source: Collegium Wratislaviense (DATE), cw.edu.pl; used with permission.

[1] This is called *supervision* at Cambridge University.

1. search strategies of the tutee may be broadened and/or refined;
2. *Google Scholar* search, with the use of the advanced functions the browser offers, can be recommended alongside regular online queries;
3. the benefits of setting up an account on *Academia.com*, *ResearchGate* or another site of this type can be pointed out to the tutee;
4. the ways of evaluating the quality of the publications found (number of citations; author's academic renown, the reputation of the journal, etc.) may be indicated.

Once the preparatory phase is closed, a series of tutorials can begin. In blended tutoring, it seems most appropriate to have the two modes, traditional and online, interspersed.

A traditional meeting between the tutor and the tutee lasts between 30-45 minutes. The time is more or less evenly allocated to two activities: reading the essay aloud (student) and a discussion of the work presented (student and teacher). During online tutorials, time constraints are not a factor (although it is good to limit the time of the on-essay interaction). The essay itself is shared with the tutor via the cloud (*Google Drive*, *Conceptboard* or one of the OS clouds: *iCloud*, *OneDrive*, etc.) and the ensuing discussion takes place asynchronously, with the use of the comment/ reply-to-comment function.

Based on the tutoring experience of the author, there are a number of recommendations that need to be made with reference to both tutoring modes.

Starting with the traditional scheme, it is important to take care of the positive climate of the meetings in which the student feels safe to both read the essay aloud (this, at least initially, appears to be extremely stressful) and defend their point of view. This is why the challenges presented to the student, which are part and parcel of the method, should never involve too much pressure or confrontation. Techniques that are recommended here include scaffolding, modeling, prompting, active listening, co-generative dialogue, and frequent, active feedback (for more detail cf. Harris, Freeman, & Aerni, 2009, pp. 23–39; VanLehn, 2011, pp. 197–221; Cramp, 2011, pp. 113–124; Johnson & Harreld, 2012, pp. 361–378; Bashan & Hosblat, 2012). Additionally, the tutor should always remember that it is the student – and not the teacher – that is the central figure in each tutorial. This recommendation, applicable to both tutoring modes, is particularly important in the f2f meetings. The fact that they happen in real time and, as such, are more difficult to control, makes it more likely that the teacher will dominate the meeting both cognitively and in terms of talking time, especially if s/he generally has a certain propensity for being verbose (cf. Turula, 2017). This is why, when in the traditional tutoring mode, it is particularly important to operate within self-imposed limits. Such limits are more easily set if the tutor (i) reads the essay before the meeting, (ii) drafts a set of potential questions, and (iii) learns to tolerate silence that may follow the questions s/he asks.

In the online tutorial, one of the challenges is accounting for sensory deprivation. Where non-verbal communication (facial expressions, body language) aids communication during a direct tutoring session, the online meeting requires other skills and strategies. The two most important ones include (i) precision and clarity of communication (the questions asked need to be to the point and worded according to the intellectual discipline) and (ii) a kind of ambient awareness (a sense/ability to empathize, which helps the tutor identify cognitive problems that the student may face, as well as the student's true intentions). The latter is crucial considering the impoverished social presence that may make each side prone to reading too much into what has been written by the other ("the other party is rude/insensitive/etc."). The recommendation here is to try to always assume good will on the other side (unless you are 100% certain there is none). Another challenge, which may result from

Figure 1. An insight to an in-cloud tutorial
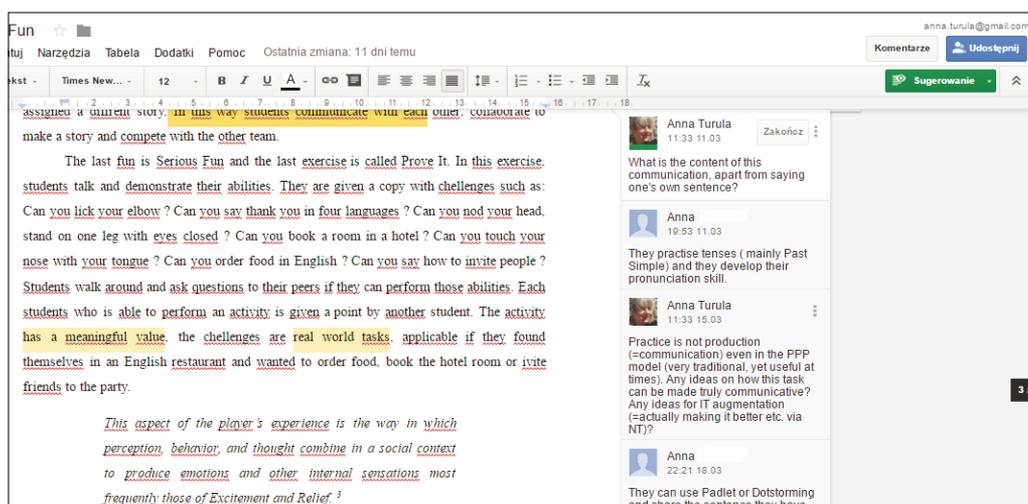
Source: own materials.

physical distance, is insufficient student motivation for participation or a tendency to procrastinate. The best course of action is to agree that the tutor asks their first questions as soon as the essay is shared, and that the first answers are due within 2–3 days; setting a time frame (e.g., two weeks) for work on a particular essay is also important.

Finally, in both tutoring modes, it is crucial to make the educational endeavor dialogic by asking the right questions and by asking them in a way that makes learning most effective. The Socratic method fulfills these two requirements. It combines the maieutics – the teacher as the midwife in the process of birth of knowledge, or the facilitator – with the elenctics – the teacher as someone who pushes the student out of their comfort zone, or the difficilitator. A sample of such a dialogue is presented below (Socratic questions underlined):

> *Student: I came up with an idea of a WebQuest: students choose an English-speaking country of their choice and for each class they are to prepare information about different spheres, for example food, education, geography, etc. They collect information during the whole semester and they present it at the end of the semester with a presentation about the country. Do you think that it would a good WebQuest?*
>
> *Tutor: The WebQuest you propose – it's potentially a good idea. However, there is a question to be answered: In what way will reading about all those different areas of life in a country be meaningful to the learners? Where is the real-life element? And pls don't get me wrong – real life does not need to have this pragmatic association (me buying a laptop). There are different (50 perhaps :-)) shades of meaning: people value learning as such; people want to be seen as knowledgeable; people are interested in cultures; etc. In what way will your WebQuest be meaningful? Can you make it even more real-life?*
>
> *Student: I've thought about your comments and I think that it would be a good idea to add telecollaboration. Just as we are doing. It could be risky, for various reasons, but it would be meaningful then, wouldn't it?*
>
> *Tutor: Telecollaboration is always worth including :-) The question would be: how, exactly, would you incorporate it into your WebQuest?*

Blended tutoring: Case study

Tutee (T) took part in a series of four tutorials held with each of the nine students participating in an MA seminar that was facilitated as part of the a teacher training program offered in the English Studies Department of the Pedagogical University in Krakow, Poland, between February and June, 2014. T was a 23-year-old woman, reflective, rather shy and not particularly eloquent. At the same time, she proved to be a very diligent student: no f2f tutorial was cancelled, and the online discussions were fluent and timely. T decided to concentrate on a relationship between gamifying a language course and student motivation for her MA thesis. A number of essay topics were suggested by the tutor via email, out of which two were chosen for the first two essays (topics 1 and 2); the other two (3 and 4) were the result of in-meeting negotiation between the teacher and the student (Table 2).

All four tutorials were recorded: the traditional meetings were audio-recorded and transcribed, and the written comments in Google Drive were saved to a separate document. Both provided research material for this research, whereby the following observations can be made (for a detailed discussion see Turula, forthcoming):

- The student's participation, in terms of word count, was much higher in the f2f meetings. However, when considered as a ratio of the total word count of the meetings, her proportional share of the dialogue was more substantial online.
- Being less verbose and more balanced in terms of teacher/student participation, the online tutorials appear to have led to more advanced levels of critical thinking.
- The social presence of both the tutor and tutee was more intense and more diverse in the traditional meeting.

Casual conversations with the student held during (especially towards the end of) each f2f tutorial also showed that T generally appreciated the f2f method. The one-on-one mode gave her the impression that the time was devoted to her exclusively; she also spoke favorably about the Socratic method. However, this method was also anxiety inducing for the tutee.

Table 2. Essay topics for Tutee (T)

Essay (tutorial mode)	Topic
Essay 1 (f2f)	Look at different theories of motivation (integrative/instrumental; intrinsic/extrinsic/goal theories) and decide which of them best explains motivation-building described in this article.
Essay 2 (e)	The concept of gamification and its influence on students' motivation.
Essay 3 (f2f)	Look at the goal theories of motivation (with special regard to achievement goals) and look for linking points between them and competency-based learning.
Essay 4 (e)	Look at the PERMA model or 4 keys to fun (links below) and decide how they relate to competency-based learning.

Source: own materials.

While she admitted the question mode of teacher-student interaction helped her continue and deepen her reasoning, it also left her with a feeling that she was not getting enough explicit feedback on her work. Consequently, she was unsure if the direction she had chosen was the right one and if she was making sufficient progress on her thesis.

Discussion

Based on the research results (Turula, 2017, forthcoming), as well as on the observations made during the author's 3-year experience with blended tutoring, the bended format is quite successful. It allows two modes – traditional and online – to complement each other. As mentioned previously, while f2f meetings create a climate of trust and build a personalized relationship between the teacher and student, the digital tutorials promote further reflection and critical thinking. This seems to be particularly important in the case of students like T – shy and rather silent – who, if exposed to f2f tutorials alone, might not have their fair share of dialogue.

In light of the above, the blended method is recommended as a method that helps facilitate and difficilitate an academic writing class through dialogue and that is effective in establishing cognitive and social presence in the micro-CoI formed by the tutor and his/her tutee(s). The way the method's essence (cf. Moore, 1968; Palfreyman 2002; Beck 2007, pp. 13–17) is translated into educational practice is enhanced with the use of new technologies: the hybrid format of the class interweaves the direct and online modes of tuition, which reinforce and supplement each other.

When it comes to student anxieties such as the one reported in the case study, they are probably the result of the educational culture the students are used to: the culture where the teacher has authority and control. Much as we might wish to reform this by encouraging more learner autonomy, we cannot ignore the apprehensions of students whose experience of academic independence is limited. This is why some steps need to be taken to accommodate the needs of the student. In response to T's concerns about her progress on her thesis, a reparatory scheme was devised. T was asked to select one essay from the pool of four she had written. This essay was subject to careful screening by the tutor and the content and form were given comments that contained evaluation and suggestions for improvement, rather than questions. This gave the student a sense of security because she had received detailed feedback on her written work pertaining to the standards set for a MA thesis by the university.

Online intercultural exchanges (OIEs): introduction

According to O'Dowd (2011), an online intercultural exchange (also called telecollaboration) is "the application of online communication tools to bring together classes of language learners in geographically distant locations to develop their foreign language skills and intercultural competence through collaborative tasks and project work" (p. 342), and is first and foremost aimed at "[the reflection] on [the students'] own culture or their stereotypical views of the target culture" (p. 344).

Task design is strongly emphasized in telecollaboration (Kurek & Müller-Hartmann, 2017, pp. 7–20). This is particularly important because, as noted by O'Dowd & Ware (2009, pp. 173–188), most online intercultural exchanges are task-based and observe the following task sequencing: information exchange, comparison and analysis, and collaboration. As O'Dowd and Ware (2009, p. 178) point out, this "combination of task types can expose learners gradually to different aspects of intercultural communication".

A good framework to rely on in task design is the one presented below (Kurek & Turula, 2013), following the task modes defined by O'Dowd and Ware (2009, pp. 173–188).

Examples of tasks and task sequences can be found

Table 3. Task sequencing in online intercultural exchanges

Stage Week (W)	Task	Tools	Type of task
Stage 1 W: 1–3	Group presentation	Prezi, SlideRocket, Glogster, Screencast-O-matic, PodOmatic	Information exchange
Stage 2a W: 4–5	First draft of pedagogical task	Blog, wiki, podcast, etc.	Creation of product
Stage 2b W: 6–7	Feedback on task from partnering group	Publishing tools	Comparison and analysis
Stage 2c W: 8–9	Task improvement based on feedback	Student choice	Creation of product
Stage 3 W: 10–11	Task execution (partnering group)	As in task	Creation of product
Stage 4 W: 12–13	Evaluation	Publishing/presentation tools	Comparison and analysis/creation of product

Source: Kurek and Turula (2013); used with permission.

in a number of publications and at uni-collaboration. eu (the *Tasks* tab), a webpage set up as part of the INTENT project, whose aim was to investigate and popularize telecollaboration (Figure 2).

Apart from their focus on task design, teachers who wish to embark on an online intercultural exchange need to be aware of a number of factors.

Telecollaboration starts long before the students of the partnering institutions are involved in it, and it initially takes place between the teachers facilitating it. Frequently, this relies on a long-term professional partnership and is another one in a series of exchanges. However, if one is new to online intercultural exchanges, it is necessary to shop around first. A good lead to follow in this respect is relying on one's own international academic contacts, such as the ones established during *Erasmus* exchanges. Another option is to start an account on the uni-telecollaboration.eu website and look for partners there (see the *Partners* tab). Teachers who are experienced in telecollaboration agree that the best results usually come from meeting in person prior to the exchange. This is an important, but by no means indispensable, factor for a successful exchange.

The first step in the preparatory, teacher-to-teacher phase is agreeing on the theme of the exchange, the relevant tasks, their sequence and chronology, and the necessary technicalities: the form, time and frequency of the intergroup contact, as well as its mode (CMC, ACMC or both). During these arrangements, it is extremely important to make sure that (i) all teachers involved are on the same page in terms of the interpretation of the theme and aim(s) of tel-

ecollaboration, (ii) the task instructions are agreed upon and formulated clearly, (iii) the task sequence and chronology accommodate the warm-up phase (the students must be given time and opportunity to process the complexity of the undertaking, they introduce themselves to their partners and get to know them, and the digital literacy of both groups must be accounted for), (iv) the in-class phases for all groups are synchronized and the activities in each classroom, in between the intergroup phases, are uniform in the sense of telecollaboration philosophy and objectives, (v) there is sufficient awareness of and sensitivity to the different communicative styles represented in the exchange by the cultures involved, and the established netiquette caters to cultural differences, and (vi) there is an agreed-upon procedure for conflict resolution.

Once the exchange commences, all teachers need to carefully monitor what is happening in their classrooms and resolve any problems that appear in the course of the telecollaborative activities between the students. As mentioned above, the latter procedure should be subject to prior agreement. At the same time, each teacher needs to take into consideration the local traditions and standards. For example, in some cultures it may be better if the teacher intervenes in the case of a misunderstanding/conflict; in others, especially in the so-called cultures of honor, things may best be left in the hands of the students. In any case, the teachers should encourage students to be explicit about their expectations regarding on-task contacts – their frequency, quality and emergency procedures – and to agree on a code of conduct. However, all measures need to be taken with full

Figure 2. The webpage of the INTENT project

Source: own materials.

awareness of the dynamicity and unpredictability of the exchange. This can be a real challenge but, at the same time, dynamicity and unpredictability is what makes telecollaboration special.

Online intercultural exchange: case study

The online intercultural exchange described here took place in November and December, 2016. The participants were students of the English Studies program from two universities: the Pedagogical University, Krakow, Poland and Pädagogische Hochschule, Freiburg, Germany. The Polish group consisted of 20 people, 19 Kraków students and one Erasmus student from the University of York, UK. The German group incorporated 22 students, all German.

The exchange did not have a specified theme. It revolved around a well-defined task to be carried out in small international teams (two Krakow students + two to three Freiburg students). The task consisted of a collaborative production of a 5-minute clip about an aspect of culture chosen by the group. The students were instructed to choose a problem and examine it comparatively for both contexts (Polish and German).

During the Krakow-Freiburg telecollaboration the following seven stages were distinguished:

Stage 1. Introductions. Each student was asked to prepare a 1-minute video presentation of him/herself as a person and a student. The presentations were made with the use of various tools, mostly *PowerPoint* slideshows captured with *Screencast-O-matic*. They were shared on a *Padlet* wall specifically created for the sake of the exchange.

Stage 2. Getting to know each other. The students from both groups watched each other's presentations. The viewing mode established for this activity was as follows: each student from a local group was assigned one person from the partnering group, watched his/her video and introduced this person to the other members of the local group in a f2f meeting. After that, students in small local groups noted the aspects of culture mentioned in the videos that they saw as interesting investigation material for the main task of the exchange (the 5-minute clip, see above).

Stage 3. Selecting task focus. In another f2f class, groups of students proposed themes that they would be willing to work on during the main task stage. The proposals were placed on another *Padlet* wall. There were no limitations on how many themes each local group could propose. Then the students were asked to indicate the three topics they liked the most. Based on this vote of preference, small international groups were selected: German and Polish students who wanted to work on the same topic were put together. In this way 10 small international groups were formed, each consisting of four to five members. The 10 themes selected for investigation in the task stage are presented in Figure 3.

Stage 4. Socializing. Before the small international groups were asked to launch their task-focused work, they were encouraged to establish themselves as a group by agreeing on and trying out different communication channels and getting to know each other better. To facilitate this stage and encourage personal communication, each group was asked to invent a team name.

Stage 5. Pro-task planning. During this stage, students in 10 international groups were asked to plan the task phase for their group. In doing so, they were supposed to address different aspects of task execution: timing, role assignment, and procedure. They also prepared mini-studies to be implemented for the purpose of providing data for the presentation and analysis for their clips; these data illustrated the aspect of culture each group had chosen to investigate.

Figure 3. Kraków-Freiburg telecollaboration. Main task themes (*Padlet*)
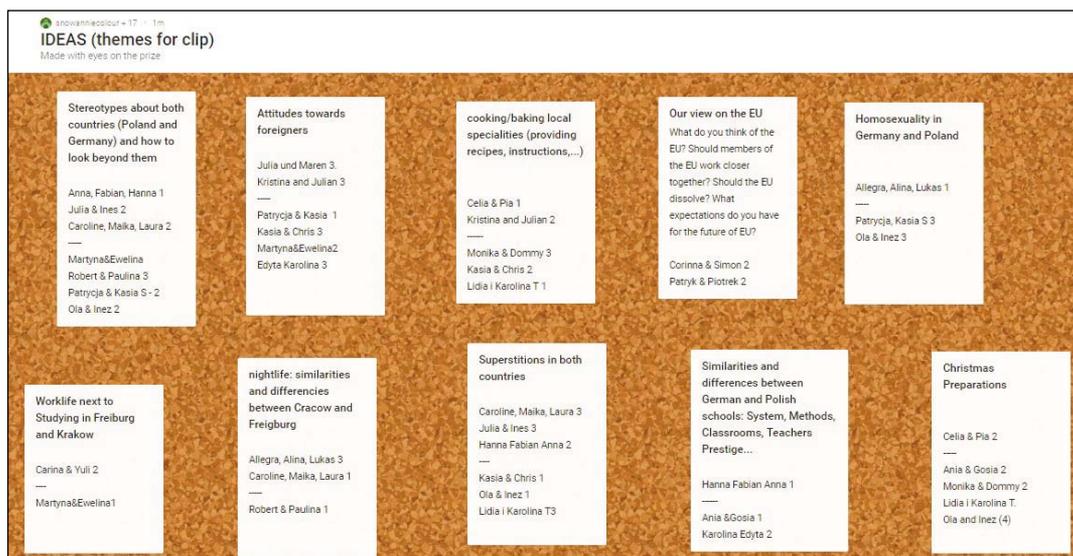
Source: own materials.

Figure 4. Main task clips shared via *Padlet*
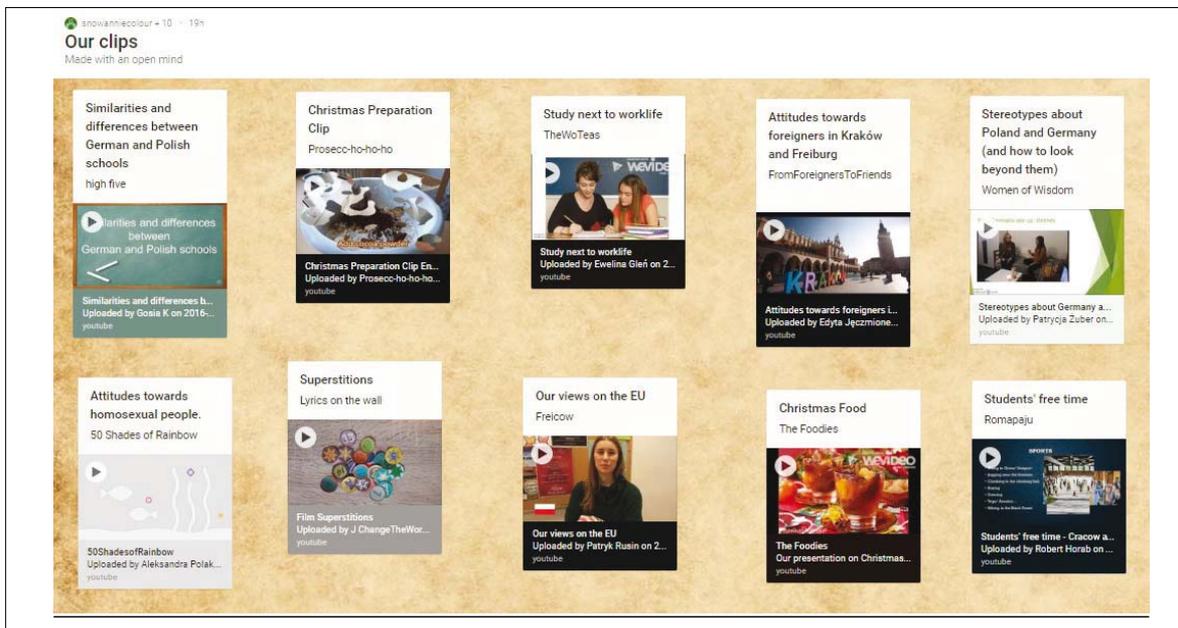
Source: own materials.

Stage 6. Task execution. Stages 5 and 6 were accompanied by weekly f2f in-class meetings, where students were asked to report on the progress of their work. Different exchange-related problems were also discussed and remedied.

Stage 7. Task presentation and evaluation. This stage was implemented in both groups during their last class in December. Both Krakow and Freiburg students watched all 10 clips – shared on yet another *Padlet* wall – and discussed them. Additionally, each group received written feedback from their teacher after class.

Discussion

The online intercultural exchange presented here can be described as highly coherent: each stage was based on the previous phase and capitalized on it. It was also a very challenging undertaking for the students, who were responsible for the planning, management and evaluation of the entire process and its outcomes. It is important to emphasize that fact that all of the groups met the deadline and prepared interesting and valuable video materials. Finally, it offered a lot of opportunities (intro clips, on-task work) to gain insight into another culture.

In view of all this, the Krakow-Freiburg exchange was an instance of establishing a modern CoI with the help of new technologies. First, the tools selected for the telecollaboration (*Padlet*, but also different tools chosen by the students: *Google Drive*, *Facebook groups*) appear to have been well chosen. They facilitated dialogue which, owing to the fact that it revolved around a challenging task, offered many opportunities for learning intercultural, social, and academic skills, such as research, analysis and discussion (including

reaching compromise across different boundaries). Second, task execution in most teams resulted in establishing a positive social climate and good group dynamics. Finally, the telecollaboration described was also a pedagogical success in the area of long-distance project work: the students from both universities learned it first-hand, in action, and succeeded in completing their task.

The Krakow-Freiburg exchange also had a few weaknesses, which are discussed below together with potential measures that can be taken to avoid such problems.

First and foremost, the task execution stage (which lasted 3 weeks) turned out to be too short. The research needed to collect data for the presentations was laborious and time-consuming. As a result, the students complained about the haste that, as they saw it, affected the quality of both the process and the products of telecollaboration. This is why the on-task phase will be longer if the telecollaboration scenario presented here is implemented again.

Second, the main problem reported by the students, during in-class and online reports, was communication: its quality and frequency, as well as different expectations thereof. Therefore, it is necessary to emphasize a number of measures to be taken: a longer socializing phase and an encouragement of students to verbalize their expectations concerning communication at the very beginning of the exchange (to discuss expectations with their partners and agree on a code of conduct). Underscoring the importance of students sorting this out on their own is dictated by another observation: teams in which in-group problems were remedied by one of the teachers seemed to have slightly lost their social momentum.

All in all, online intercultural exchanges seem to be a highly recommendable form of academic education. They are challenging, they provide a context for project work in which there is real audience, and they raise cultural awareness and improve intercultural communicative competence by sensitizing the parties involved to the differences in perceptions, working styles and netiquette.

Flipped university class: Introduction

Historically speaking, flipped learning can be traced to Bergmann and Sams (2012) and to the Khan Academy (Thompson, 2013). In both cases, the teachers (Bergmann & Sams, 2012; Khan, DATE) noticed that in-class time could be put to much better use if the lecture/theory/introductory part of the lesson is watched by the students at home, in the form of a video tutorial.

If one opts for the short and concise definition of the flipped class, the core of any flipped class – university classes included – is having the lecture/reading part at home and spending the at-school time doing what previously amounted to homework. Yet, if we do not want to stop at the level of the technique but delve into the philosophy behind it, it is important to keep in mind that flipping one's classes is primarily about combining individualization and collaboration, leaner independence and interdependence, and, most of all, experiential learning.

This is why each flipped class should be planned in such a way so as to maximize the above-mentioned outcomes. The at-home part should allow the students to learn at their own pace and at the time and place of their choice. The materials prepared by the teacher should appeal to a variety of learning styles (convergent/divergent, judging/perceiving, linear/networked) and be multimodal and diverse, to help the student stay focused and understand the concepts presented. At the same time, students should be encouraged to be more autonomous: to familiarize themselves with content other than that recommended by the teacher and to search and evaluate resources in terms of their reliability and utility vis à vis their educational interests and needs. The in-class time should be spent on students learning experientially by applying the knowledge gained at home in practical activities. In doing so, students can be allowed to learn *from* each other and – should they wish so; or should the teacher see it as beneficial – *with* each other, putting their joint expertise into creating products, either practical applications or mental models of what they have learned. The roles of the teacher are as guide a source of feedback, and, most importantly, the author of the tasks that contextualize each individual input as well as collaborative effort.

The philosophy of the flipped classroom, such as the one presented above, goes hand in hand with the design thinking model of education with its five stages: *discovery* (understanding), *focusing* (definition, interpretation), *imagining* (ideation), *prototyping*

(experimentation, presenting draft of problem solutions to a potential user), and *evolution* (trying, reflecting and sharing) (Barseghian, 2011; IDEO LCC, 2012).

Figure 5. Design thinking cycle
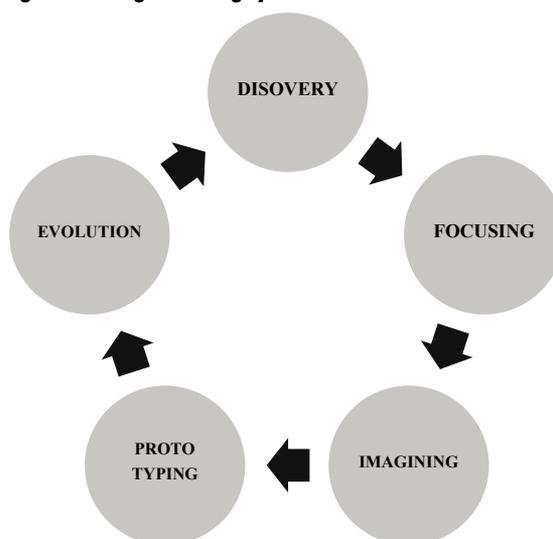
Source: own materials, informed by Barseghian (2011); IDEO LCC (2012).

In a class organized in accordance with the philosophy of the flipped classroom – relying on a combination of independence, interdependence and experiential learning – the at-home stage is devoted to discovery: acknowledging the challenge/question through familiarizing oneself with the materials prepared/recommended by the teacher, understanding the problem and deciding how it should be approached (based on independent research). If the materials to be studied are accompanied with questions that encourage interpretations, the *focusing* stage may commence at home. Focusing continues in the classroom, if the at-school phase opens with a sharing session in which students discuss their understanding of the issues at hand. Then, with a well-designed in-class task, the students go through the *imagining* phase, leading into the *prototyping* phase, in which they devise their answers to the problem and present them to the teacher (the "user") in a series of cyclical steps (1st draft–teacher feedback–improvement–revised draft–etc.). The final draft worked out by the students is submitted for evaluation, leading to the *evolution stage* in which the teacher offers overall feedback on the product. The students can act on this feedback to improve their work. This cycle is applicable to a number of academic assignments, from essays (written collaboratively in class based on reading done at home), through mental models of problems, to practical applications of knowledge gained (e.g., pedagogical tasks in teaching study programs, business plans in economic studies, designing technologies in engineering, etc.). Examples of assignments are presented in the case-study section below.

Research shows the effectiveness of flipping, both for the students and the teacher. In a study carried out by Rose (2014), 88% of 450 teachers stated that flipping increased their job satisfaction, with 99% intending to continue using the model. In 80% of the classrooms investigated, students' attitudes to learning improved; in 67%, test results went up, especially those of weaker students. The study did not investigate the utility in higher education. Nevertheless, the data are encouraging. Combined with the results of studies pointing to the utility and effectiveness of design thinking in higher education (Matthews & Wrigley, 2011; Koria et al., 2011; Laakso & Clavert, 2014), research suggests that flipping is a pedagogical option worth considering in higher education.

Flipped university: Case study

A course taught by the author of this article at the Pedagogical University in Krakow called *Individual differences in language learning, on- and offline* is an example of a flipped class in higher education.

This course is hosted on the university's Moodle platform and consists of seven modules, all organized in a similar way. The class is provided with a list of learning outcomes (1). The materials for the at-home study are then made available. The materials are divided between four groups into which all students are assigned at the onset of the course (2). The students are asked to familiarize themselves with the materials before they attend class.

As a result of materials being divided between groups, each student is equipped with only a quarter of the knowledge needed.[2] This is why the in-class phase begins with sharing information studied at home, following Aronson's jigsaw class model.[3] This phase is facilitated through a (series of) question(s) meant to channel student interpretations of the content (3); the sharing goes on in a space external to the Moodle course – *Padlet*, *Dotstorming*, *Google Drive*, etc. (4).

When this phase is completed, the knowledge gained at home is put together in groups and processed using the jigsaw mode and is then translated into a product. As this course is part of the EFL teacher-training program, the in-class tasks are related to language education. In the case presented above, it consisted of students' writing their own WebQuest (Figure 8).

The product can also be a mental model of connections between good and bad ways of learning, language-learning strategies and digital tools that are likely to promote the use of said strategies (Figure 9; example from another class).

As in-class activities follow the design-thinking model, the students – working collaboratively in each of the seven modules – are allowed to present their product to the teacher at different stages of its de-

Figure 6. Sample course module: materials for home study

Source: own materials.

[2] In the case of Class 2 (above), each of the four groups had to complete a different WebQuest about WebQuests – an activity familiarizing the participants with the idea of WebQuest and principles of writing a good one on their own (cf. www.WebQuest.org).

[3] https://www.jigsaw.org/; in Class 2 this meant that comparing ideas drawn from four different WebQuests.

Figure 7. Sample course module: materials for in-class activities

Source: own materials.

Figure 8. The WebQuest task

Source: own materials.

Figure 9. The mind-mapping task

Source: own materials.

velopment. Since all outcomes are aimed at potential learners of English as a foreign language (the students' most likely future professional environment), the teacher acts as both the real user (him/herself) and a kind of proxy (representing hypothetical language learners). As a result, feedback is offered by the teacher from these two different perspectives (*I like it./Your students will possibly like it.*). The evaluation is offered continuously throughout task execution, and the students can make product amendments as they

see fit. At the end of the in-class time, the outcomes are submitted for the teacher's overall evaluation, which is offered via the Moodle course activity *assignment*. Based on this evaluation, the students can reflect upon the quality of their work and think of potential improvements. The cycle is closed in the next class, when students are asked to self-evaluate, confirming whether or not they have acquired the knowledge and skills promised in the introduction to the module in terms of learning outcomes. The self-evaluation is carried out through a Moodle poll (6).

Discussion

The module presented – similarly to the other 6 modules of the course discussed – can be inscribed into the design thinking cycle presented in Figure 10.

In such a case, the course follows the philosophy of flipped classrooms in a number of ways. The jigsaw class and task-based modes promote collaborative learning. As a result – and this is said based on a three-year experience teaching the course – each of the seven classes is a beehive of activity, fuelled by both the peer-to-peer sharing of ideas and the teacher's continuous feedback. The at-home phase caters to individual differences in terms of the anytime/anywhere studying mode and offers a variety of materials (text, video, WebQuest). The fact that the form of the class is attractive to students has been confirmed over

3 years of implementation by their in-class involvement, as well as by the favorable opinions expressed in informal exchanges with the teacher.

The observations of and reflection on the implementation of the course are the basis for the following guidelines for flipping classes in higher education:
(1) The at-home component can be entirely based on ready-made materials, both textual and multimedial. Such was the organization of the course described. However, for a personal touch, the teacher may opt for self-made content. The knowledge of tools[4] such as *Screencast-O-matic* or *Present.me* (for video tutorials), *Piktochart* (for infographics), *Timeline[JS]* (for timelines) or *Strip Generator* (for comics) would then be useful.
(2) The jigsaw mode, useful in promoting collaborative learning and group integration, is also potentially problematic for class preparation: knowing that each meeting begins with a sharing phase, some students may choose to come unprepared. If this becomes a problem, the teacher may want to think about solutions, such as students' reports on the at-home reading/watching component.
(3) Teacher working time is comparable to how much one would invest in non-flipped education. What may be important to know is that this investment is the greatest when choosing materials and evaluating students' work. Special effort needs

Figure 10. Design thinking at flipped university
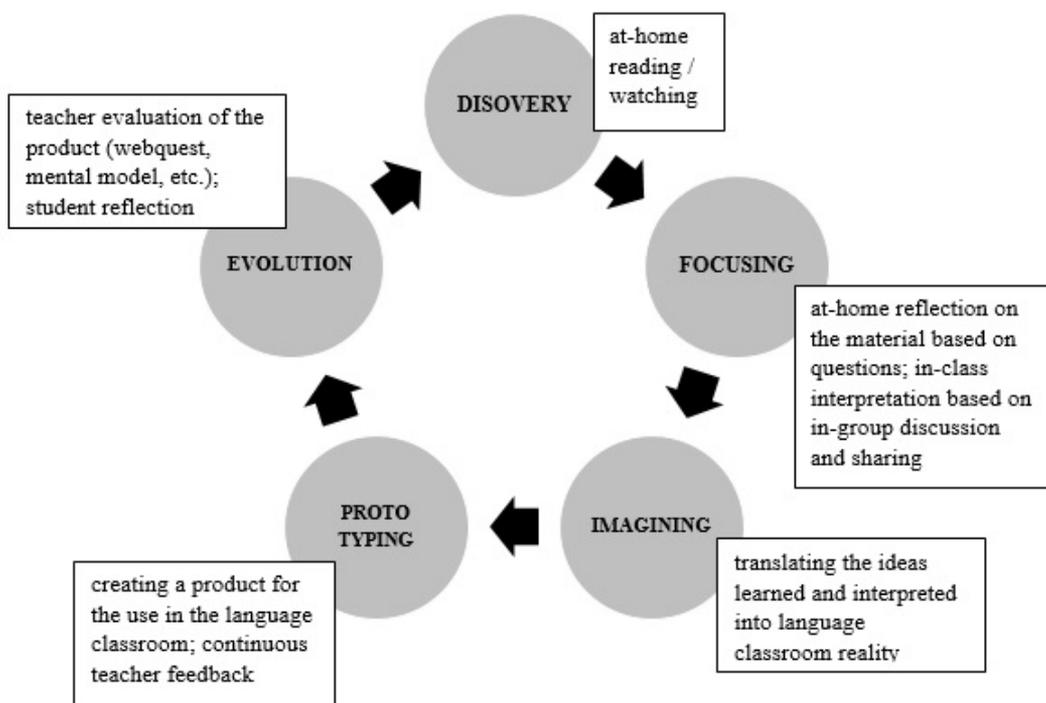
Source: own materials.

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[4] This is only a selection.

to be made for the materials to be closely related to the in-class task; in other words, the activity planned for the meeting should not be possible to finish without the at-home reading/watching component. In turn, feedback on what the students produce in class should be constructive so as to trigger reflection necessary for evolution. Comparatively less is done in class: the teacher only facilitates prototyping; otherwise, their role is marginal. Yet, given that what happens in class is of utmost importance (the experience, the collaboration), it seems legitimate to state that the core of the flip is the in-class task itself. Therefore, the teacher's effort should primarily be directed at devising a good task around which all other actions should revolve.

Overall, flipping should be seen as educational philosophy, rather than a mere technique. New technologies enhance pedagogy by accommodating, individually for each student, the *understanding*, *focusing* (partly) and *evolution* phases of design thinking. They also play a part in the *imagining* and *prototyping* phases, which are carried out in class, while the students translate knowledge into skills in a continuous dialogue with their peers and their teacher. As a result, a community of inquiry is created, which merges the individual and the collaborative.

Conclusions

The three pedagogical solutions presented in this article constitute three ways in which new technologies can be used in university education to create communities of inquiry. All three cases involve students shifting between *collaborative* and *individual* modes, learning with and from each other, as well as reflecting on the process. In blended tutoring, the two modes change as the alternative forms of tutoring (traditional and online) interweave; in the flipped class–with the altering learning environment–oscillating between the at-home reflective stage and in-class collaboration. In telecollaboration, the *together* mode is so rich and complex that it offers numerous and varied opportunities for *individual* interpretation, re-evaluation and mindshift.

All this, as–hopefully–proven by the three case studies, results from a symbiotic relationship between academic education and technology, a relationship which is flexible and non-reductionist, and which can successfully use—but does not have to be confined to—the university e-learning platform.

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ICT goes university. Three ideas and their implementations

The article looks at three pedagogical solutions – blended tutoring, online intercultural exchanges and the flipped classroom – which capitalize on the symbiosis between pedagogy and new technologies. Each of the three proposals stems from a belief that university education should be dialogic and result in meaning construction rather than content transmission.

There is a common scheme in which all three solutions are presented here. First, each proposal is accommodated with a certain theoretical outline. Then the pedagogical routines employed during its implementation are discussed. Each presentation cycle is closed with a description and analysis of a case study: the interaction between a tutor and a tutee in the case of blended tutoring; the course of a 2014 German-Polish telecollaboration for Online Intercultural Exchanges; and finally, the different aspects of a merger between the flipped university and the Design Thinking model.

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The different dimensions of widening access to virtual scenarios in the WAVES project

Andrzej A. Kononowicz, Luke Woodham, Sheetal Kavia

Learners welcome practice-oriented environments that promote learning by experience, rather than those that explicitly give them rules to memorize. Yet, many educators believe this form of instruction is unattainable for them and their students. The aim of this paper is to demystify the concept of virtual scenarios, which are a form of e-learning resources used in scenario-based learning. This is presented in the context of the WAVES project, an ERASMUS+ initiative aimed at widening access to virtual scenarios. This article presents ways to simplify the design and use of scenario-based learning resources. This project is open to community participation, and the authors intend to help popularize virtual scenarios and to make e-learning courses more varied and attractive.

Educators planning e-learning activities can use a wide collection of instructional designs. Clark and Mayer proposed classifying these into three architectures of instructions: receptive, directive and guided discovery architectures (Clark & Mayer, 2008, p. 27). Receptive designs focus on the presentation and transmission of educational content to learners, using online lectures or videos. When following directive instructional designs, the educational content is divided into small chunks of knowledge, which are first introduced as rules, and then as examples that can be followed and practiced. Immediate feedback to instantly correct undesirable outcomes is then provided. This type of instruction is very common in procedural training or computer adaptive learning, where learners are involved in frequent formative assessment, in the form of quizzes. The premise of discovery learning is that educators design an environment in which the learners will be able to construct their own knowledge. Research results show that pure discovery learning is inefficient, as a high level of unaddressed confusion may arise when learners are left to master a new learning objective unaided (Kirschner, Sweller, & Clark, 2006, pp. 75–86). However, this problem may be remedied when carefully chosen guidance is introduced into the discovery environments (Alfieri, Brooks, Aldrich, & Tenenbaum. 2011, pp. 1–18). Guided discovery approaches include project-based learning, simulation-based learning, game-based learning, etc. These terms are often inter-preted differently, and the boundaries between them are blurred, so there is little definitive consensus on the characteristics of each approach. It goes beyond the scope of this paper to resolve those conflicts. The intention is rather to focus on features characteristic to a particular type of guided discovery learning called scenario-based learning (SBL). Recently, the use of this term has been promoted through a book by Ruth Clark entitled "Scenario-based e-Learning" (Clark, 2013, p. 5). It is important for SBL activities to cast the learner in a job-realistic situation that requires collecting information on a problem, taking action, and reflecting on the reactions of the environment. This differs from game-based learning, by focusing on particular problems to be solved without the competitive elements encountered in games. Computational simulation, which is understood as dynamic mathematical models embedded in e-learning environments, may be part of SBL resources but is not a compulsory component. SBL leverages both group activities common in problem-based learning and self-directed learning.

Virtual scenarios

Virtual scenarios (VS) are electronic learning resources applied in SBL. A common implementation of VS in healthcare sciences are virtual patients (Cook & Triola, 2009, pp. 303–311) but their use need not be limited to medicine. The scenarios may focus on other subjects of job-relevant tasks, like virtual clients for lawyers or bank loan applicants, or even objects like virtual cars for repair, or virtual test tubes with content to be identified. The authors understand the term "scenario" as a situation that may happen in the workplace. The steps in a scenario can be triggered by learner actions or be time-driven. A scenario may be a linear chain of events or branched events; there may be several routes through it, depending on the learner decisions made. Navigation interfaces may consist of hyperlinks to follow, hierarchical menus of items to select, clickable full-screen active objects, or virtual worlds to explore (Clark, 2013, p. 57). The data presented in a scenario usually starts with a job-relevant trigger that engages the learner to take action, and proceeds to the analysis of a set of case-related

Figure 1. The start screen of a virtual scenario in the system OpenLabyrinth

Source: own study.

data that is presented in a way that mirrors real life, and that may need to be retrieved or synthesized by the learner from the environment itself. Feedback may be classified into instructive (i.e., correcting particular actions) or intrinsic feedback (i.e., showing consequences of action to be interpreted by the learner). Intrinsic feedback, in particular, is a key component of SBL activities, while mechanisms to support reflections on the problem-solving tasks and feedback received are crucial elements of effective VS. Figure 1 shows the initial screen of an instance of VS in the OpenLabyrinth system in use at St. George's, University of London.

The WAVES project

WAVES stands for Widening Access to Virtual Educational Scenarios, and is the name of a project co-funded by the ERASMUS+ framework (The WAVES project, http://wavesnetwork.eu). The project partners come from across Europe and include both academic (the project coordinator St George's, University of London; Karolinska Institutet, Aristotle University of Thessaloniki, and Masaryk University) and corporate partners (Bayer plc and Instruct AG). Additionally, the project is supported by a community of associated institutions located in many countries outside of Europe. The project began in 2016 and will run until the end of 2018.

The goal of the project is to increase the use of VS by streamlining workflows in existing authoring software and providing guidance to the wider community about how to design effective SBL content. The

primary target group for WAVES is educators, since they determine the instructional design that will be used in teaching and produce SBL educational content. However, we cannot address their needs without also considering two other entangled stakeholder groups: students and educational technologists. As system end-users, educators have little interest in detailed technical issues and require a VS authoring system to be both user-friendly and produce learner-friendly scenarios. Such improvements in software tools are often made by enhancing application programming interfaces (API), which, while technical in nature, are transparent to end-users, and enable new functionality to be delivered.

SBL is not about a particular technology and its implementation can range from a clever use of hyperlinks in Microsoft PowerPoint, to the use of virtual world environments (Clark, 2013, p. 12). The use of a specific tool does not automatically guarantee that the outcome will involve VS, as defined by SBL methodology. Technically complex SBL environments have their merits, but their use may not always be more effective than simpler technologies (Dankbaar, Alsma, Jansen, van Merrienboer, van Saase, & Schuit, 2016, pp. 505–521). It is also true that the design of technically complex resources, as established in contemporary video games production, is a highly resource-intensive process that requires collaboration from specialists in many disciplines. WAVES takes an alternative stance by empowering individual e-learning enthusiasts who are keen to use SBL for design and to use VS in their organizations, even in low budget settings. The VS in Figure 1 is presented using very

simple technical means: just a text description and two options. It could be easily enhanced with high quality video clips or an impressive 3D environment, provided the right budget, but this does not change the instructional design behind it. The major shift happens when there is no directive voice saying "you should do this", as is present in lectures or tutorials, but instead the student makes an independent decision and experiences what changes it brings in the simulated environment. WAVES aims to show that it does not require a film director or specialist in artificial intelligence to make this shift in education.

The outputs from WAVES are organized into two toolkits: knowledge and technical. These serve to show the open-ended nature of the project, delivering a wide range of ancillary resources or mechanisms that welcome community engagement. The knowledge toolkit contains a spectrum of resources that are directly useful for educators, including tutorials, best practice guidelines and examples promoting the methodology behind VS. This will culminate with a MOOC on SBL organized on the FutureLearn (https://www.futurelearn.com) platform in spring 2018.

The WAVES technical toolkit involves changes or enhancements of the existing VS systems to make them more accessible and usable for educators. By a VS system, we mean a suite of integrated tools, including an authoring component that enables teachers without a detailed technical background to create VS, a player to display the VS to selected groups of learners, user management panels and some basic analytic tools. The developments will focus on two VS systems: the open source project OpenLabyrinth (http://openlabyrinth.ca), led by David Topps from University of Calgary, and the established system CASUS (http://www.instruct.eu/en/casus-software), maintained by Instruct AG, a spin-off company initiated by LMU University of Munich. All improvements included in the toolkit will be implemented in these software products.

OpenLabyrinth is a web application developed in PHP. VS in OpenLabyrinth are branched. Screen cards that reflect each stage in the executed scenario can be extended by different question types, counters, timers and multimedia content. A set of extensions for the system is available, including the use of Semantic Web technology to describe the content of VS for later automatic discovery and retrieval (Dafli, Antoniou, Ioannidis, Dombros, Topps, & Bamidis, 2015, pp. e16), and a module for human-computer hybrid interfaces (Topps, Cullen, Sharma, & Ellaway, 2016, pp. e1659v1). The current version of OpenLabyrinth is 3.4, but a new version 4 is in development, with a modified architecture of the source code. Starting with version 4, the official name of the system will be shortened to Olab.

CASUS is a web application developed in Java (Hege, Kononowicz, Pfähler, Adler, & Fischer, 2009, pp. 51–55). VS in CASUS, unlike those in OpenLabyrinth, do not branch. Instead, a diverse set of activities corresponding to every stage of the scenario is permitted (e.g., selecting options from long menus with hundreds of items to prevent answer bias, taking advice from experts, or judgment of individual results in diagnostic tests). There are also tools that are independent of the navigation between the screen cards (e.g., taking notes on observations). CASUS offers a rich set of tools for user management, exposure of VS in courses (e.g., permitting spaced activation [Maier, Hege, Muntau, Huber, & Fischer, 2013, p. 45]) and summative, controlled electronic exams.

OpenLabyrinth, as a publicly available, free of charge software product, can be used by anyone who follows the WAVES project. The changes implemented in CASUS will benefit current users and make the product available to new markets. We also hope that the lessons learned while developing these enhancements (i.e., technological know-how that will be shared by the project) will simplify introducing desired changes in other VS systems that are not part of this project.

The technical toolkit

In accordance with the design-based research methodology (Wang & Hannafin, 2005, pp. 5–23), the development and research in the project proceeds through an iteration of probing user needs and implementation phases. The project started with a survey, and a series of semi-structured interviews and focus group discussions among the associate and dissemination partners. The resulting user stories were prioritized in an agile card sorting process, with detailed results presented in a report by Schwarz and Kavia (2017, pp. 65–70). These general user requirements have been transformed by the WAVES technical reference group into three types of concrete tasks: improvements to accessibility, improvements to usability and improvements to integration. These are presented in more detail in the following two sections, as well as in Figures 2 and 3.

The tangible outputs included in the technical toolkit will be, depending upon the nature of the development task, a set of branches to existing open source projects or initiated new small projects in public code repositories as GitHub (https://github.com); graphical designs as wireframe models or templates; and technical reports describing proposed improvements. These outcomes will be handed over to the software partners maintaining the code of the two reference VS systems (OpenLabyrinth & CASUS) and made available via the project's website.

In the development process, it is important to consider the plans of the organizations that control the VS software code. For instance, OpenLabyrinth is now undergoing a major architectural shift from a monolithic to a microservices-based architecture. While this represents a great opportunity to influence change, it also contributes to a state of uncertainty on the final shape of the system and, to a certain degree, an inability to test proposed developments. This project has to work within the time and resource constraints allocated to the technical toolkit. For these

reasons, the project consortium has decided not to undertake significant back-end changes, and instead focus on extensions to the presentation layer and developments of loosely coupled modules and services for both CASUS and OpenLabyrinth.

Accessibility and usability enhancement

Figure 2 presents an overview of five development tasks around accessibility and usability within the WAVES project.

Accessibility is often identified as web accessibility, as understood by the W3C Web Accessibility Initiative (WAI). This empowers users with different forms of impairment (e.g., sight or hearing disabilities) to use and author web content (e.g., by enabling the use of assistive technology as screen readers). In WAVES, this term is understood more broadly to include any means by which the potential user group may be widened. This understanding encompasses internationalization (i18n) efforts that enable the community to prepare different language versions of VS user interfaces (task T1, Figure 2). The necessary measures may include separation of the user interface text into property files, adequate character encoding, alignment of interface elements where international differences occur e.g., in right to left languages (e.g., Hebrew or Persian), etc. The

implementation of these changes is supported by i18n guidelines and mark-up rules (e.g., W3C Internationalization). Related to this task is construction of community engagement tools for translation, which could include crowdsourcing and open APIs (like Google Translation API) to accelerate translation and using different organizational forms to sustain and improve quality of the translations.

The results of the WAVES needs analysis showed that more than half of respondents want to use VS on small mobile screens (Schwarz & Kavia, 2017, pp. 65–70). A potential barrier to that are static user interfaces. Improvements used in task T2 (Figure 2) involve not only mechanisms to make the layout of elements scalable (responsive), but also more selective for mobile learners. The problem is addressed by building a collection of layout templates for user interface elements, which could be used by scenario authors, depending on their needs.

Usability is often considered the "ability of the user to use [a] thing to carry out a task successfully" (Tullis & Albert, 2013, p. 5). WAVES focuses on the simplification of common workflows as encountered during the authoring and use of VS. The project has agreed on a set of common use cases (e.g., "Author creates a short branched VS with one decision point" or "Instructor wishes to know who in the group of students has completed a VS"). These are

Figure 2. Overview of accessibility and usability enhancement in the WAVES project
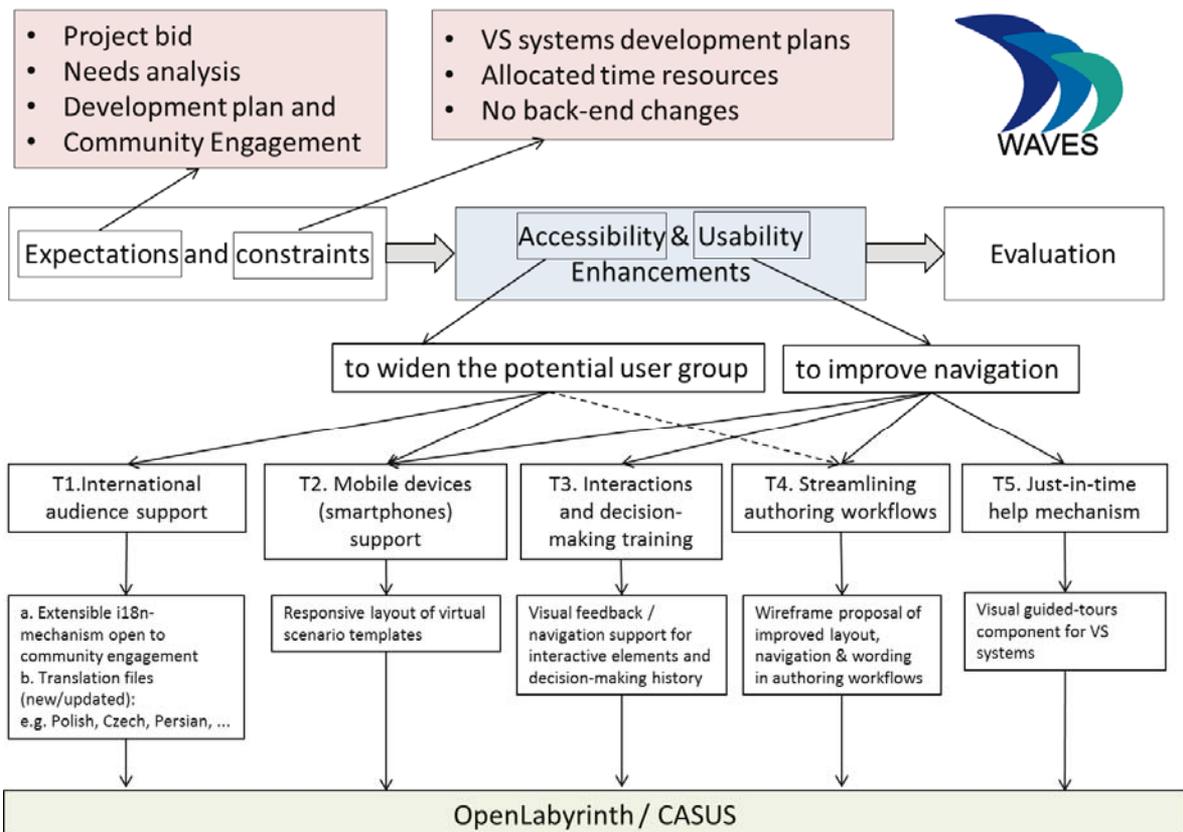
Source: own study.

now analyzed using users with limited experience of VS authoring, to arrive at wireframe models of a streamlined layout (T4, Figure 2). Within this activity, the consortium also reviews the workflows from the perspective of usability heuristics: in our case, we used Jakob Nielsen's ten usability heuristics (Nielsen, 1995). Additionally, we take into consideration the web accessibility guidelines developed by W3C WAI (https://www.w3.org/WAI) – e.g., Web Content Accessibility Guidelines – WCAG – or Authoring Tool Accessibility Guidelines (ATAG).

Task T5 (Figure 2) further simplifies the design of VS by adding a visual guided tour mechanism to the authoring tools. Such guidance, which is currently being implemented using the Intro.js library (http://introjs.com), enables a step-by-step introduction for novice educators to individual elements of the user interface, which is displayed as a semi-transparent layer on top of the regular user interface in a web browser.

Finally, task T3 (Figure 2) focuses on the intuitiveness and functionality of user response elements in VS. This means, for instance, corrections of usability issues when displaying feedback to response options (e.g., in multiple answer controls) or support for reflection when reviewing the data obtained and the choices made throughout the scenario. This task is especially interesting in branched scenarios in which the navigation graph may be complex. The topic of visual learning analytics has been preliminarily researched by one of the authors, in the context of MOOCs with integrated virtual patients (Kononowicz, Berman, Stathakarou, McGrath, Bartyński, Nowakowski et al., 2015, p. e8), and is investigated more in depth by WAVES, by building more universal and lightweight tools.

Integration of virtual scenarios

Integrations needed by VS system users are divided in three categories: security, learning analytics and the formation of microservices (Figure 3).

The WAVES development activities with respect to security (T6, Figure 3) aim to solve the frequent problem of e-learning users who need to memorize many login credentials. WAVES focuses on the existing Learning Tools Interoperability (LTI) specification (https://www.imsglobal.org/activity/learning-tools-interoperability), developed by the IMS Global Learning Consortium. LTI offers a single-sign on mechanism that enables adding VS as an activity to learning management systems (LMS) and MOOC platforms, without the need for separate authentication. The consortium members' initial experience with this topic (exemplified by the integration of OpenLabyrinth into the OpenEdX platform [Stathakarou, Zary, & Kononowicz, 2014, p. e672]) is now transferred to extensions of other VS systems (CASUS) and generalized by tests of the existing implementation with different LMS (Canvas [https://www.canvaslms.com], Moodle [https://moodle.org] and FutureLearn [https://www.futurelearn.com]).

Learners leave many traces of activities while experiencing SBL content. In the age of big data and analytic techniques, the community expects to use log data in order to optimize the learning process. Data locked in proprietary systems represents a barrier to access, but a solution to that is to broadcast events in an e-learning infrastructure. The specification often used for this purpose is Experience API (xAPI, https://github.com/adlnet/xAPI-Spec). The assumption is each of the learner's basic activities (e.g., opening an educational video clip) will generate an xAPI statement. According to the technical specification each statement is a type of formalized log entry which must have at least three components: actor, verb, object – e.g., "John opened this video". These statements can then be captured by registered dedicated services, called learning record stores (LRS), and be enabled for analytic processes, either with tools integrated in the LRS or exported elsewhere (e.g., to performance dashboards in LMS). Examples of LRS include tools like Learning Locker, Watershed LRS and ADL LRS. Since many e-learning

Figure 3. Integration mechanism of virtual scenarios in the scope of WAVES
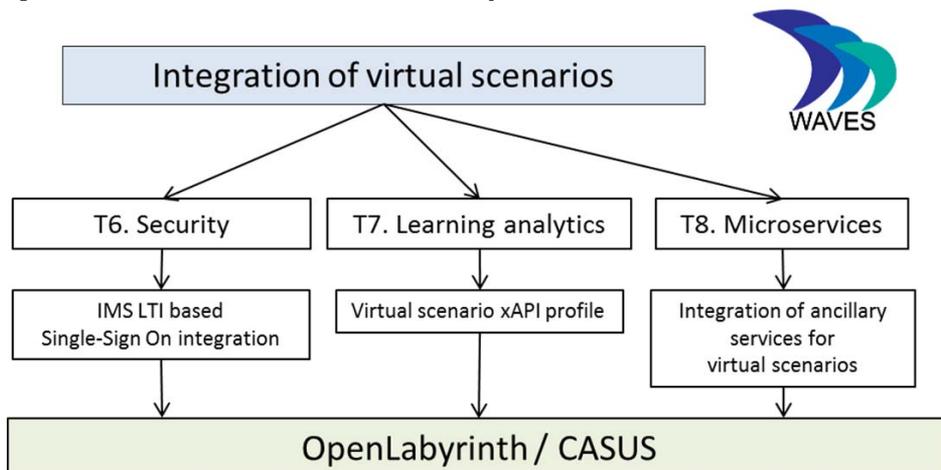
Source: own study.

tools support xAPI statements, this infrastructure will enable a broader analytic view of learning processes. The constraints imposed by the xAPI specification are loose: e.g., anyone can propose new verbs or data structure for the actors or objects. The efficient use of xAPI for learning analytics requires more standardization in order to clarify the use of individual elements of statements, which are achieved using application profiles. The WAVES project contributes to that effort by supporting the MedBiquitous Learning Experience group (https://www.medbiq.org/learning_experience) in their task of building profiles for VS and virtual patients (T7, Figure 3). The constraints discussed include the required structure of information in the learning activities descriptions, which represent objects in xAPI statements, and the semantics of verbs recommended by the profile. This will enable aggregation and analysis of user experience data produced by different SBL tools. In this task, the consortium demonstrates how to build a learning analytics infrastructure that consists of a VS system connected to a LRS and analytic tool to enable educators and learners to discover more about the processes happening in SBL activities.

Finally, WAVES promotes the current trend of converting monolithic architectures into sets of microservices and demonstrates how this applies to VS systems (T8, Figure 3). Following the microservice paradigm, a VS system is reduced to the basic core functionality with many optional components that can be plugged into the system when needed. Inga Hege developed an exemplary microservice that extends the VS systems' core functionality (Hege, https://github.com/clinReasonTool/ClinicalReasoningTool). This microservice is a graphical tool based on a concept-maps approach and is displayed next to the main screen of the VS. While the learners proceed through a scenario, they may note their observations, hypotheses and plans, and show graphically how those relate. Learners' input into the tool, showing their reasoning process, can be then compared with an experts' answer for feedback (Hege, Kononowicz, Nowakowski, & Adler, 2017). This tool will be integrated in both reference VS systems of WAVES (OpenLabyrinth and CASUS) using a RESTful API.

Discussion

Ideas around VS and SBL can be traced back under different names across many years of research on instructional design. Yet the dissemination and usage of this method in education is not as widespread as might be expected, considering its established merits. WAVES is attempting to remedy this by providing methodological and technical toolkits with the aim of widening access to this form of instruction.

For instance, usability testing and improvement is crucial for software development and is recognized by major players in the mass market. However, usability is often neglected in academia, where the emphasis is instead on innovation and the pragmatic achievement of stated objectives, even though this can often come at the expense of user-friendliness. Within WAVES,

developers and advanced users of VS software step back and explore how they can simplify authoring workflows for educators who are interested in using VS in their teaching.

Accessibility is often understood as being limited to compliance with formal specifications, such as WCAG. Such standards are without doubt very useful, benefitting not only those with disabilities but also reducing the cognitive load and improving flexibility in general usage. But beyond that, WAVES aims to widen access to other groups of potential users (both educators and learners) that might have encountered barriers, such as language or limitations of their mobile devices. It is important to distinguish between the accessibility of the authoring tool and the accessibility of content the authoring tool is producing. For instance, WAVES focuses on extending the authoring tools to enable teachers to produce VS for mobile devices, such as smartphones or tablets. Supporting teachers to design their VS on smartphones is not within the scope of the project and, in the opinion of the authors, is unlikely to be useful. On the other hand, i18n efforts or usability enhancement pertain also the authoring tool itself to enable easier navigation in the VS editors for the educators.

Different integration mechanisms considered in the scope of WAVES address the fact that SBL software tools are not self-standing artifacts and should fit into existing IT infrastructure. One of the authors of this paper discussed integration mechanisms of virtual patients in a paper published in E-mentor in 2010 (Kononowicz, Hege, Adler, de Leng, Donkers, & Roterman. 2010, pp. 82–86). It is interesting to follow how the mechanisms popular at that time (e.g., AICC HACP, SCORM RT or MedBiquitous Virtual Patient) have changed in recent years. The methods introduced in this paper (e.g., LTI, xAPI, RESTful interfaces) are more lightweight, and move away from transfer of content between systems and towards the integration of services.

Many of the project partners in WAVES have a background in developing VS in medicine. This should not be surprising, as healthcare science has a long history of simulation and the innovative use of technology in education. Yet, there is no reason the tools discussed here could not benefit the wider community. Indeed, systems such as CASUS have already been used in law sciences and biochemistry. The mechanisms on which the tools are built, such as the construction of a state graph for VS, are present in many types of guided discovery approaches, including game-based learning. The increasingly modular architecture and the idea of exchangeable layout templates enable the creation of bespoke solutions for individual disciplines, using the same scenario-based engine.

WAVES has recently reached its halfway point and the final outcomes are still yet to emerge. The release of the toolkits is planned to occur by the end of the project in 2018. Authors of this paper would like to invite the readers to follow the project's activities and engage in the use of VS in their teaching and training.

The experience of WAVES might also motivate those who develop their own VS or more general e-learning software to reflect on the question of how accessible their tools are for their target users.

Conclusions

In this paper, we have summarized the concept of virtual scenarios as often used in scenario-based learning. The WAVES project, as presented above, aims to disseminate knowledge about this form of learning and promotes it by simplifying access to VS systems. Our intention was to show the diverse range of tasks that can be related to improving accessibility, using the example of WAVES project activities.

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The different dimensions of widening access to virtual scenarios in the WAVES project

Background: Virtual scenarios are e-learning resources that present job-realistic situations, promote taking actions and provide learning via the consequences of decisions made. The WAVES project attempts to widen access to virtual scenarios for educators and learners.

Aims: The aim of this paper is to present different facets of simplifying access to virtual scenarios that structure the developments in WAVES.

Methods: The developments are driven by user needs and shaped by a technical reference group to follow current trends in information technologies. They also meet the constraints of the legacy code of two exemplary authoring systems (OpenLabyrinth and CASUS) and fit the limits of allocated time resources.

Results: The paper characterizes eight tasks that address accessibility, usability and integration challenges related to virtual scenarios. These involve enhancements in such topics as internationalization, responsiveness, streamlining of workflows, just-in-time guidance, support in interaction and reflection, single sign-on security, learning analytics and microservices.

Conclusions: The authors describe the features characteristic to scenario-based learning and outline development directions to improve access to virtual scenarios. The examples demonstrated using two authoring tools are intended to influence improvements in similar e-learning systems.

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Resisting the Global Campus:
Strategic, Political and Cultural Dimensions Undermining Efforts to Build a Virtual Campus

Laurel Newman

Deborah Windes

Using archival data and news reports, the authors analyze the initiation, implementation and decision to discontinue the University of Illinois's Global Campus for online learning. This case study focuses on the strategic, political and cultural dynamics involved in this attempt at educational innovation.

The organizational science literature is replete with exhortations about the importance of learning from organizational failures (Birkinshaw & Haas, 2016, pp. 88–93; Edmondson, 2011, pp. 48–55; Kayes & Yoon, 2016, pp. 71–79). The University of Illinois's attempt to launch the Global Campus provides an important opportunity to observe and learn from the failure of a major innovative educational initiative. The analysis of these events is enriched by examining the issues involved using three classic perspectives of organizational analysis; a strategic design perspective, a political perspective, and a cultural perspective (Ancona, Kochan, Scully, Van Maanen, & Westney, 2004).

Introduction

At his 2005 investiture, B. Joseph White, newly appointed President of the University of Illinois, described his vision of creating a virtual university as a fourth campus designed to provide online education (Heckel, 2005). This campus would be an addition to the three existing campuses in Champaign-Urbana, Chicago and Springfield, Illinois. By the summer of 2006, a proposal for the online "Global Campus" was being widely circulated. The explicit goal of the proposed Global Campus was to offer high quality programs with flexible, convenient access, in a way that was educationally innovative and financially sustainable (University of Illinois Global Campus Overview, 2007). The original concept outlined in the proposal was for the Global Campus to be established as an independently accredited for-profit entity that would offer online students access to University of Illinois programs in areas of high demand, such as nursing, business and education (Jaschik, 2007). The Global Campus would rely primarily on non-tenure track, part-time faculty teaching courses that would be delivered in an 8-week, accelerated format, designed to appeal to adult learners. The campus was expected to have sufficient enrollments to break even by 2010 and to reach an enrollment goal of 10,000 students by 2012.

The original proposal encountered a wall of faculty resistance. After intensive negotiations, the model was revised in a compromise designed to overcome faculty objections. The new campus would now be non-profit and would not seek independent accreditation. Courses and programs would be designed and supervised by faculty members in existing academic departments (Jaschik, 2007). The Board of Trustees approved the establishment of the revised initiative and the Global Campus opened their doors to new students in January 2008.

By April 2008, media reports indicated that after investing $3 million startup funds for IT, recruiting and service infrastructure, the Global Campus had only managed to enroll 10 students (Scholz, 2008). By November of 2008, enrollment had only reached 120 students and administrators were concerned about the lack of high demand baccalaureate completion partnerships from the other three campuses (Des Garennes, 2008).

After a failed attempt to win faculty approval of separate accreditation for the Global Campus, President White formed a task force to seek alternatives. The task force proposed a "reset" of the University's approach to online education entitled "Global Campus 2.0". In effect, the 2.0 proposal dismantled the Global Campus and returned responsibility for online education back to the three individual campuses of the University of Illinois.

The timeline in Figure 1 provides a summary of pertinent facts related to the history of the global campus.

Methodology and theoretical perspective

Key events related to the initiation, implementation and elimination of the Global Campus were identified, using both news reports and archival documents. News sources included the local papers for each of the three campus locations, including the Chicago Tribune, the Champaign News-Gazette and the Spring-

Figure 1. Timeline for Global Campus

Fall 2005	Summer, 2006	2007	April 2008	May 2009
Investiture	Original Concept:	Revised Concept:	$3 million start up invested	Global Campus 2.0
Vision of 4th Campus	Global campus as independit for profit entity	Global campus partnership with departments on 3 campuses	November 2008	Online back to campuses
	Projections: 10,000 students by 2012		120 enrolled	
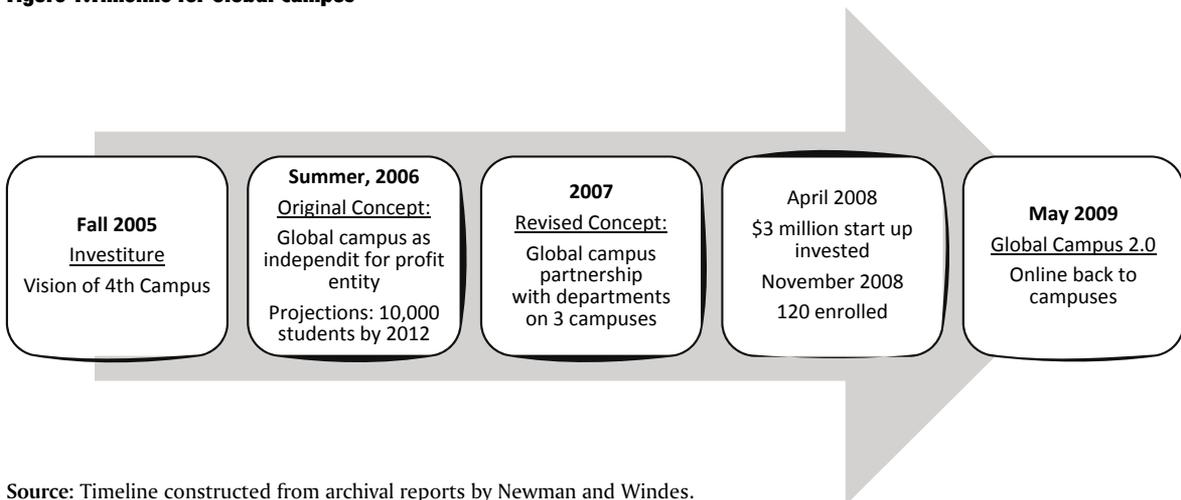
Source: Timeline constructed from archival reports by Newman and Windes.

field Journal Register. Senate minutes, resolutions and reports related to the Global Campus were identified via a search of the terms "global campus" or "GC" for each of the three campus senate websites, including the University of Illinois, Champaign/Urbana, University of Illinois, Chicago and University of Illinois, Springfield. A similar search was conducted for minutes and resolutions on the University Senate's Conference (the combined Senate for all three campuses) website, the website for the university's governing body, and the University of Illinois Board of Trustees.

The analysis that follows reviews the Global Campus initiative from three classic perspectives on organizational behavior: a strategic design perspective, a political perspective and a cultural perspective. Each of these perspectives emphasizes different elements of the initiative, the organization, and its environment, as contributors to the innovation's success or failure.

The strategic design perspective suggests that an innovation will be effective if the strategy and organizational design fit the conditions of its environment. Important factors in a strategic perspective include the competitive environment, the financing strategy, the marketing strategy, choices about production, and the organization's structure and design (Ancona et al., 2004; Nadler, Tushman, & Nadler, 1997).

The political perspective suggests that an innovation's effectiveness depends on successful negotiations with internal and external stakeholders who hold varying interests. Important considerations from a political perspective are to understand whom the relevant stakeholders are and what they have to gain or lose with the innovation (Ancona et al., 2004; Myeong-Gu, 2003, pp. 7–21).

The cultural perspective suggests that an innovation will be effective if it can be incorporated into the assumptions, norms, symbols and stories inherent in the existing organization. Understanding the underlying values and meanings attributed to innovation attempts is critical if an innovation is to be effective from a cultural perspective (Ancona et al., 2004; Büschgens, Bausch, & Balkin, 2013, pp. 763–81; Hogan & Coote, 2014, pp. 1609–1621).

Strategic design factors

Competitive Environment

The Global Campus initiative was launched in the summer of 2006. Online education was already a competitive field with nearly 3.5 million students, nearly 20% of all United States higher education students enrolled in at least one online course by the fall of 2006 (Allen & Seaman, 2007). The competitive environment was consistently identified in press coverage as a contributing factor to the failure of the global campus initiative, as illustrated by the following quote:

...there were a number of contributing factors, not least of which was increasing competition for online students, which pitted Global Campus against dozens of low-cost, Web-based operations as it sought to grow enrollment and recoup its initial investment. "We were entering a market that was simply becoming more competitive all the time," said Terry Bodenhorn, a history professor at the Springfield campus who was then serving as the chair of the system-wide University Senate's Conference. (Kolwich, 2009)

Financial Strategy

Rather than pursuing an incremental build up, the Global Campus initiative invested in administrative infrastructure upfront. An initial investment of $3.9 million in fiscal year 2008 grew to nearly $10 million worth of expenses, which exceeded revenues by fiscal year 2009 (Approve Fiscal Year 2008 Internal Financing Program for Global Campus, 2008). The large upfront investment put pressure on tuition prices, which ranged from $495 to $900 per credit hour (Approve Tuition Rates, Global Campus Programs in Recreation, Business and Global Safety, Fiscal Years 2008 and 2009; Approve Global Campus Tuition Rates for University of Illinois Graduates, 2008). The need for enrollments

drove decisions about programming, a choice that was later criticized in the Global 2.0 report:

> The current Global Campus has pursued matters of scale by setting numerical target enrollments and profit goals and then selecting and designing programs that can be "scaled" to meet those goals…Global Campus 2.0 would certainly seek scalability. But rather than doing so by setting targets and then designing programs accordingly, Global Campus 2.0 would work in the opposite way, starting with quality, sustainable programs that have a track record of success, and then allocating resources to help them grow in appropriate ways and at appropriate rates to meet social needs and market demand. (Burbules et al., 2009)

Production strategy

Another controversial strategic choice included in the Global Campus initiative was to separate course design from course delivery, a model widely adopted by for-profit online universities as a method for keeping costs low. Faculty criticism of this model is reflected in the following quote from a campus senate report:

> …the dominant model of course development expressed in the Global Campus proposal: regular faculty develop high quality content, and lower-cost adjunct instructors do most of the delivery (at a rate apparently envisioned to be in the range of $3K–$4K per section). While other, more collaborative models are not ruled out, the basic organizational framework and business strategy of the proposal seem to assume this division of labor: and, indeed, if lowering production costs to achieve "up-scalability" is the primary value, some such division seems inescapable. Unfortunately, this is not the recipe for quality. It does not reflect best practice in some of the leading online programs on this campus. And it makes no provision for ongoing, continuous improvement in teaching, which requires the close collaboration of course content providers, designers, and instructors. Moreover, knowledge changes, technologies change, approaches to online teaching are continually changing – and these issues of content, form and pedagogy are highly interdependent. Quality education – particularly at the envisioned levels of undergraduate degree completion and graduate degree programs – is not a routine matter in which course "content" once developed, can simply be replicated for courses year after year (to be "delivered" by remote-controlled adjuncts hired on an enrollment-driven basis to do so). Ongoing development, updating, and redesign will require the continuous involvement of faculty experts in the subject areas. (Aminmansour et al., 2006)

Organizational Structure and Design

One of the most controversial strategic choices was the decision to establish the Global Campus as a separate, fourth campus organized as a limited liability corporation (LLC). The online programs offered by the Global campus would compete directly with existing online programs offered at the other three University of Illinois campuses. Thus, while directing additional resources to expand online offerings was a welcome decision, the organizational design choice to do this by creating a separate LLC entity was not:

> We are proud of the successful online education programs (including UI on-line) at the three campuses; and we support the appropriate expansion of such programs as a component of a comprehensive University experience. Created and taught mainly by the full-time faculty, these online degree programs are indistinguishable from their on-the-ground traditional counterparts. We question the wisdom and efficiency of establishing a separate structure that will undoubtedly compete with existing programs. (Aminmansour et al., 2006)

Facing widespread resistance on this point from all three campus senates, this strategic choice was quickly reversed prior to implementation. The Global Campus was now to be called the Global Campus Partnership and to work more closely with the existing academic structure:

> Thomas P. Hardy, a spokesman for the Illinois system, confirmed that the online program would now be nonprofit, and that academic programs would remain connected to existing departments. Hardy said that administrators had wanted the structure they proposed originally because they wanted it to be "a little more nimble and to respond to the market more quickly than perhaps you would get through the traditional academic unit structure". (Jaschik, 2007)

Low cost strategy

The choice to focus on keeping costs down, rather than creating innovative approaches, also garnered criticism:

> Innovation is just as important as quality and the Global Campus needs to be about innovation in online teaching and learning, not only reduced costs and increased access (indeed, innovation will be essential to achieving both of the latter). The proposal assumes a "Blackboard" style of course design and delivery that is already becoming anachronistic for many online programs. We believe this to be a mistake, and a serious weakness of the proposal. (Aminmansour et al., 2006)

Political factors

University of Illinois, like most public universities in the United States (AAUP Joint Statement on Governance of Colleges and Universities, n.d.), has a long history of commitment to shared governance. The University of Illinois Statutes state, "As the responsible body in the teaching, research and scholarly activities of the University, the faculty has inherent interests and rights in academic policy and governance" (University of Illinois Statutes, 2017).

As stakeholders, faculty of the University of Illinois viewed the Global Campus initiative as counter to their interests in a number of ways.

Lack of faculty input

Faculty expressed concerns that they were not involved in the original conception of the Global Campus

initiative. This was perceived as a threat to faculty rights with respect to shared governance, particularly in curricular matters:

We believe that the proposed model has been developed with far too little input from those on our campus (and presumably also on the other two existing campuses) with the most experience in online teaching, and in positions of responsibility for the very sorts of programs under consideration – from the faculty who teach the courses through the department and college executive officers to the key campus administrators. The Global Campus initiative will fail if they do not feel that they share ownership of it, and that it is something with which they not only are willing to be associated but want to be associated; and yet few of them have even been consulted about it in any meaningful way to date. It therefore is not surprising that it is seriously flawed in many respects. (Aminmansour, 2006)

Lack of faculty oversight going forward

The perceived threat to shared governance rights was not restricted to the origination of the Global Campus initiative, but built into the ongoing operation of the proposed model.

The proposal needs to make clearer provisions for ongoing significant university faculty involvement in, and control over, initial and continuing course development, not as a discretionary option but as a basic feature of Global Campus courses. (Aminmansour et al., 2006)

Concerns over quality and reputation

The Global Campus, as a freestanding entity, was also seen as a threat to the quality and reputation of the University of Illinois. A threat to the university's reputation implies a potential loss of status for the faculty employed by the university system.

If the Global Campus initiative is to receive significant faculty support, the development and articulation of a sound academic model that promotes and sustains the educational quality traditionally associated with the University of Illinois will be essential. (Bodenhorn, 2006)
(…) the University of Illinois "brand" (in the current manner of speaking) is generated by the quality and reputation of the other three campuses; and however successful the Global Campus may be as a teaching enterprise, there will always be an interdependence of status – both perceived and real – that gives all three existing campuses a stake in how the Global Campus represents this University. For many people around the state, around the country, and around the world, the Global Campus may well become a prominent part of the public face of the University of Illinois – for better or for worse. We must attempt to ensure that it is for the better. (Aminmansour et al., 2006)

Concerns about competition with already existing online programs

Prior to the announcement of the Global Campus initiative, all three campuses had been increasing their online offerings. This was particularly true at the Springfield campus, which at the time offered 20 academic programs online, with 25% of their total headcount being comprised of exclusively online students (University of Illinois Springfield Senate Global Campus Task Force Report, 2006). Concerns about the possible diversion of resources from these efforts arose (University of Illinois Chicago Senate Town Hall Meeting on the Global Campus Initiative, 2006), as well as concerns about whether the Global Campus programs would compete with these less well-funded efforts:

We already know that the demands of the Global Campus will require our faculty and staff to choose between competing priorities, work for the Global Campus or work for our campus. In Phase Two, when partnerships end, we see direct competition between the GC and campus based programs. With online students accounting for around 25% of our total, UIS has much to lose. We ask whether it is wise to help build an entity that has the capacity to put our online programs in jeopardy, either by losing current levels of enrollment or future growth. If the Global Campus came to us, not as our potential competitor in the form of a for-profit LLC insisting on the use of part-time faculty and a centralized curriculum, but as an organization committed first and foremost to helping us expand and improve our offerings according to our local customs and values, we would be more than willing to find ways to partner. (University of Illinois Springfield Senate Global Campus Task Force Report, 2006)

Cultural Lens

Cultural conflict with profit driven motive and emphasis on the bottom line

In addition to creating concerns from a structural perspective, the proposal to create a separate, for-profit LLC violated the values and norms held by faculty members in the existing institution:

The Global Campus Initiative Final Report describes a for-profit Limited Liability Company (LLC). While this business model may appear to provide certain advantages, many of our faculty are concerned by such a departure from our "traditional academic culture". The "for-profit" nature of the LLC raises many concerns. While we recognize that the Global Campus should be financially sustainable, would the motivation to create profits lead to an over emphasis of the "bottom-line" and, ultimately, begin to effect the academic decision making of the Global Campus? Would it not be better for the LLC to be a "not-for-profit"? (Kaufman, 2006)

Threat to identity as a selective institution

A separate, less selective admission process for the Global Campus gave rise to concerns about the institution's identity going forward:

We have real concerns about the reconcilability of a program model that admits everyone who meets a (presumably fairly low) minimum standard with the profile of a university with high standards of admission and correspondingly high expectations for student performance and degree completion. (Aminmansour et al., 2006)

Concerns about changes to the meaning of a University of Illinois degree

In the original proposal, there was no stated intention to differentiate the diplomas of graduates from Global Campus programs. This led to concerns about the true meaning of a University of Illinois degree, given differing admission and program completion standards:

We are concerned that, with no differentiation between a degree from the "Global Campus" and the traditional degree from our three existing campuses, the value of the traditional UI degrees at our (other) three campuses may be diluted and diminished by association, and by the indistinguishability of academic credentials. (Bodenhorn, 2006)

Separation of traditionally bundled faculty roles

The Global Campus model limited tenured and tenure-track faculty roles to "subject matter experts" who had input into course design but not into course delivery. This plan violated notions about the role of faculty in the education process:

The proposal contemplates courses that would be created and developed by UI faculty, but taught by non-faculty. Decoupling course development from teaching is deeply problematic. Teaching is an iterative process, a complex multidimensional activity that involves interaction between the faculty, the students, and the materials over time. It should be a continuous and unbroken loop. Separating course development from teaching is a hallmark of training, rather than education. (Bodenhorn, 2006)

Threat to tenure system

The choice to hire part time and full time faculty who were not part of the tenure review process also violated closely held values and norms:

The USC is deeply concerned about the fundamental absence of a real faculty – meaning fulltime, tenure-track faculty with the protection of academic freedom – in the proposed Global Campus, especially in the formative and mature phases. The intended involvement of regular UI faculty in the initial planning and supervision of courses and degree programs notwithstanding, we see a campus staffed mainly by non-faculty staff who are given the responsibilities of delivering courses to students. We have serious concerns about the educational responsibility and probable resulting quality of this approach. (Bodenhorn, 2006)

Conclusions

In response to the failure of the Global Campus to generate projected enrollments and revenues, it was ultimately dismantled. A new taskforce, convened by President White, proposed Global Campus 2.0, a new plan that redistributed online offerings to each of the three campuses. The only centralized function that remained was UI Online, an office charged with coordinating web page listings and responding to inquiries about the online programs offered by the three campuses. UI online also facilitated collaboration for system-wide issues that benefited from a coordinated response, such as state authorization and accessibility compliance.

Under the Global Campus 2.0 reconfiguration, the three campuses experienced incremental growth in their online programming and enrollments. Between 2009 and 2017, the number of degree programs offered increased by about 50% to a total of 15 bachelor and 46 master degrees. The number of certificate programs also grew by about 25% to a total of 78 certificate programs (University of Illinois Online Catalog, 2017 DATE). In addition, the Urbana campus had significant involvement with Coursera as a platform to offer MOOC courses, certificates and degree programs. A recent review of Coursera's website indicates over 70 active courses provided by the University of Illinois (Coursera Course Catalog, 2017).

The authors' review of the events surrounding the initiation, implementation and dismantling of the Global Campus suggests that it is important to understand innovation attempts from a multidimensional perspective. For innovations to be effective, the organization's strategy and design must fit the conditions of the environment, the interests of both internal and external stakeholders must be negotiated, and cultural factors need to be considered to ensure that the innovation will fit within the organization.

In the case of the Global Campus, the initiative did not deliver as envisioned due to difficulties that encompassed these strategic, political and cultural challenges. Unfortunately, it is often the case that the strategic aspects of initiatives are decided on without a thorough understanding of the political and cultural consequences. Even if the strategy proposed for the Global Campus had been perfectly developed and executed, the political and cultural challenges would have still posed significant threats to the success of the initiative. In the wrap up of the report, where the President's taskforce recommended the dismantling of the original plan and a distributed online approach, the following quote emphasizes the costs of not using a multidimensional approach:

As David J. Gray, Senior Vice President at the University of Massachusetts, and former CEO of UMassOnline said at a recent UPCEA conference in Boston, "Vast resources, elegance of models and the best technology all pale in importance relative to institutional buy in." Gaining that buy-in, from faculty, from campus units, and from administration at all levels across the campuses, is what this proposal is designed to accomplish. (Burbules et al., 2009)

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Resisting the Global Campus: Strategic, Political and Cultural Dimensions Undermining Efforts to Build a Virtual Campus

This study examines the initiation, implementation, and ultimate elimination of the Global Campus Initiative at the University of Illinois. Using archival data and media reports, the authors examine the events surrounding the initiative through three classic organizational behavior lenses: a strategic design perspective, a political perspective, and a cultural perspective. These perspectives posit that the effectiveness of an organizational innovation depends on whether the strategy and organizational design fit the conditions of its environment; whether internal and external stakeholders believe it is in their interests to adopt the innovation; and whether the innovation can be incorporated into the cultural norms and values of the organization. The data indicates that there was insufficient attention paid to all three areas, which led to the ultimate disbanding of the effort. The outcome of the Global Campus Initiative suggests that organizations seeking to innovate should first address the strategic, political, and cultural forces that may pose a challenge to successful implementation.

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Degree reforms in Scandinavian higher education – intersection between Europeanization and national policies

Dinah Kagan

European higher education (HE) systems have undergone extensive reforms over the last two decades to keep pace with globalization processes and increased competition. Some were initiated by national governments, whereas others were the result of joint European initiatives. Among the most prominent European policies is the Bologna Process. Launched in 1999, the Bologna Process aimed at establishing a European Higher Education Area (EHEA) by 2010. One of its core objectives was the adoption of a system of easily readable and comparable degrees. In this article, the intersection between European and national HE policies and processes is considered. The extent of Europeanization versus domestic pressures is examined, with a focus on degree structure reforms in the three Scandinavian countries: Denmark, Sweden, and Norway.

The following is asked: To what extent were the Scandinavian degree reforms European- or domestic-driven? For the analysis of Europeanization vs. national motivations behind the degree structure changes, a definition of Europeanization within HE is applied. Within this definition, the Bologna Process is identified as an intergovernmental, weakly obligating, Europeanization process with an impact on EU and non-EU countries (Musselin, 2009, p. 184). The choice of degree reforms is motivated by its central role in the Bologna Reforms. The focus on the Scandinavian countries is due to their historical, cultural, and linguistic similarities as well as their relatively similar development as welfare societies in which education plays a central role. The study draws on an analytical framework with a focus on the Europeanization of public policy (Vukasović, 2012, p. 211). Within this context, attention is given to how European initiatives accommodate national settings through external incentives, social learning, and lesson-drawing mechanisms (Vukasović, 2013, p. 315). European and domestic motivations, as well as Europeanization process mechanisms, are examined through an analysis of Bologna documents, national reports, and publicly accessible official records, such as legal and other types of documentary material. The study maps the rationales and practices of the degree reform for each country, providing a comparison drawing from the theoretical framework of Europeanization mechanisms.

The article is structured as follows: "Europeanization processes" discusses the definitions and theoretical framework of mechanisms of Europeanization with a focus on HE. "Degree structure reform" illustrates the degree structure reform and its implementation in Scandinavia. Finally, the level of Europeanization vs. national influence is analyzed in "Europeanization mechanism models".

Europeanization processes

Europeanization is generally defined in the literature as the domestic impact of the EU (Sedelmeier, 2011). However, the definition may be elaborated to include processes developed by supranational or intergovernmental bodies that affect EU as well as non-EU countries (Musselin, 2009, p. 183). Three steps are essential to Europeanization: there must be some degree of 'misfit' (1) between European level and domestic level processes, which would lead to adaptation pressure (2); and various actors must react to the adaptation pressure (3).

Europeanization of HE

Europeanization of HE occurs when HE systems and organizations adapt to pressures coming from European HE initiatives (Vukasović, 2013, p. 312). These may produce changes to national HE policies, generate mutual interactive processes between domestic and European level, or provide legitimization for domestic policies. Dakowska (Dakowska, 2015, p. 138) points to the strategic usage of European frameworks and recommendations by national policy makers. Vice versa, negative Europeanization as a reaction to European initiatives may arise.

Three models of Europeanization mechanisms are suggested (Vukasović, 2012, p. 213): an external incentive model, a social learning model - these two often being complementary - and a lesson-drawing model. The Europeanization mechanism models presented in Table 1 are modified to also reflect non-EU processes, such as the Bologna Process (Melo, 2016, p.61). The external incentive model assumes a logic of consequence. HE entities will adopt European policy if the benefit is estimated to exceed the cost, or if the costs

Table 1. Europeanization mechanism models

Model	Principal actor	Hypotheses
External incentives	EU	European rules are adopted if the benefits of rewards exceed the adaptation costs, or if the costs of non-compliance are deemed too high.
Social learning	EU	European rules are adopted if the actors are persuaded of their appropriateness.
Lesson-drawing	Government/institution	European rules are adopted if they are expected to solve national policy problems effectively.

Source: M. Vukasović (2012), p. 215.

of non-compliance are deemed too high. In the social learning model, the actors will need to be persuaded into following the European policy through a process of collective learning (Börzel & Risse, 2003, p. 66). Rules must be deemed legitimate by the actors in their content or the process in which they were developed. In this respect, the Bologna Process has been criticized for the lack of participation of academic staff in the development of its rules (Vukasović, 2012, p. 216). Finally, in the lesson-drawing model, European policy is adopted if it serves a national agenda.

Launched in 1999, the Bologna Process provides a means of mainstreaming HE activities towards similar overarching policies. External legitimacy challenges often lead national HE systems to policy emulation (Dobbins & Knill, 2017, p. 68). In this respect, the Bologna Process provides a platform for overcoming national opposition to HE reforms. Nonetheless, other considerations may be in play in the process. The Bologna Process is non-legally-binding, without specific incentives or direct consequences in the event of non-compliance, apart from scorecards in stocktaking reports; as such, it does not comply with the legal coercion mechanism. Rather, norms, guidelines, and standards have been introduced and incorporated into national systems through a transnational soft governance regime, although other EU initiatives promote the implementation of Bologna objectives. These entail wide-ranging policy objectives within HE. The focus of this research is solely on the degree structure reform, although similar phenomena were observed in the implementation of other Bologna objectives (Schmidt, 2017). Research suggests significant convergence of rhetoric and objectives alongside consistent divergent national policy instrumentation and outcomes (Vukasović & Huisman, 2017, pp. 1–19).

Degree Structure Reform

The declared purpose of the Bologna 3+2+3-degree objective was to improve employability and student mobility and increase international competitiveness (European Ministers of Education, Bologna Declaration, accessed May 7, 2016). Implementation of the degree reform was confronted within national contexts, with each country approaching the reform at its own pace and according to domestic agenda. Highly controversial, the degree reform was often criticized for overproducing HE graduates who are,

on the one hand, 'lightweight academics' and, on the other, compete against vocationally-trained workers who are desperately needed by employers. However, against public criticism, findings show that graduates with general and applied sciences Bachelors' degrees end up in occupations with higher earnings and prestige (Neugebauer & Weiss, 2017, p.25). Nonetheless, a consensus on the three-cycle degree structure has been achieved, and Bologna objectives of facilitating international activities within Europe and increasing global competitiveness have gained ground (Hunter, 2015, p.105).

Degree structure reform in Scandinavia

By 2007, the Bologna degree structure was fully implemented in Scandinavia. However, the reforms were approached at a different pace and with different reasoning, as varied national contexts led to various reactions to the adaptation pressures (Table 2). Denmark had begun reforming its one-cycle degree some years before signing the Bologna Declaration. In fact, the Bachelor's degree was introduced in Denmark as early as 1988, though with little success, as the vast majority of students continued on to Master's studies, and employment showed little interest in the new degree. In 1993, the 3+2+3-degree structure was introduced, a process first finalized with the 2003 legislation. Traditional Danish professional degrees were included within the first cycle, thus adding some form of flexible transition between programs.

Sweden began its degree reform at a later stage than Denmark, as it was the general conception that the Swedish modular credit system already incorporated most Bologna features (Lindberg-Sand, 2007, p. 7). Later concerns for the compatibility of Swedish degrees led, in 2002, to a review of the degree structure. The conclusions were distributed among HE institutions (HEIs) for comments. On February 2006, the government bill "New world – new university" was adopted by Parliament. Once approved, the implementation process was rapid. By 7/2007 all students were enrolled in the three cycle degrees.

In Norway, discussions regarding the duration of degrees have been ongoing since the 1980s (Vaboe & Aamodt, 2009, p.61). In 1998 the Mjøs Committee was appointed to review HE, and in 2001 a White Paper was submitted. In 2003, a comprehensive HE 'Quality Reform' was launched with the goal of improving the quality of HE and implementing the Bologna degree

Table 2. Conditions for Europeanization Process

	Level of misfit	Reaction to adaptation pressures
DK	Three-cycle degree structure introduced prior to Bologna not fully implemented.	Introduction of new HE law without further discussion or debate.
SE	No degree structure planned prior to Bologna.	Four-year process prior introduction of new degree structure. Swift implementation.
NO	General HE reform initiated prior to Bologna. Bologna degree structure was incorporated.	Two-year debate before a decision on the reform. Medium/lengthy period of implementation.

Source: BFUG 2007 national reports Denmark, Sweden, Norway, http://www.ehea.info/pid34367/implementation-and-national-reports.html.

structure (Nielsen & Andreasen, 2015, p. 104). The reform was the result of governmental influence on HE, but also of European processes (Faegerlind & Stroemqvist, 2004, p. 212).

To sum up, in all three countries the conditions for Europeanization have been identified. Where low levels of misfit existed, the reaction to adaptation pressures was fast and there was little debate. High levels of misfit detected in Sweden and Norway led to slower responses to adaptation pressures. A closer examination is required to determine the Europeanization models operating in the processes.

Europeanization mechanism models

Analysis of the Europeanization mechanism models applied (Table 3) indicates that the lesson-drawing mechanism was used in Denmark and Norway, as the Bologna Process helped bring a national reform agenda to completion. In Sweden, on the other hand, the external incentive mechanism was primarily applied, as the reform was a result of concerns for recognition of Swedish degrees. Three main concerns triggered the reform in Denmark: the lengthy duration of HE studies, and, as a result, the delay in transition into employment; a high drop-out rate; and the need to internationalize Danish HE. Denmark's implementation of the Bologna Process was a strategic conformity, as it provided the opportunity to finalize the process of internationalizing HE degrees with a view to recognition, mobility, and attractiveness. In parallel, other reforms were enacted targeting governance, accountability, and financing, yet these remained separate from the Bologna reforms.

Sweden did not have an urgent domestic need to reorganize its degree system, as it already had short-time vocational programs in place to meet labor market needs (Ahola, Hedmo, Thomsen, & Vaboe, 2014, accessed April 5, 2016). It was only at a later stage that concerns for potential problems with international recognition of Swedish degrees, particularly its Masters' degrees, led to the reorganization of HE programs according to the Bologna degree structure. Before the degree structure change, Swedish HE was based on a modular structure with the course as the core entity of all programs. The main arguments for the Swedish "New world – new university" reform were internationalization and comparability. Further

arguments included the promotion of student mobility and recognition of Swedish HE abroad, widening participation, promotion of employability of Swedish graduates, and competitiveness.

Despite its outsider position within regarding the EU, Norway was relatively quick to adopt the Bologna Process to take part in the education market. The Quality Reform, already set in motion before Bologna, provided a platform on which Europeanization trends could be incorporated into national change and provide a solution to domestic problems. At the core of the reform was the recommendation to give students increased rights in terms of course quality and financing of studies, and at the same time define students' obligations more clearly regarding progress and completion of studies (Faegerlind & Stroemqvist, 2004). Though previously present in HE policies, internationalization was first put at the forefront of Norwegian HE policy in the Quality Reform (Gornitzka, 2007). The former six-year (4+2) degree structure was perceived as rather time-excessive and costly for Norwegian society. Another problem was the relatively high average age of a student at graduation. By 2003, therefore, the Norwegian degree structure was ready for a change. The Mjøs Commission's conclusions were that shorter degrees would reduce drop-out rates and shorten the study period of degrees. Both issues were linked to the length of the degree and its structure. Several degree cycle alternatives were reviewed in the report, and the Bologna degree cycle was recommended. Furthermore, in its report, the Commission also emphasized the international perspective of the degree reform. Finally, the need for shorter degrees was reviewed in the light of lifelong learning. Globalization and progress require that people renew their competencies during their course of their lives. In such a setting, shorter degrees are more meaningful than long degrees. In the public debate, the Ministry highlighted the continental roots of the Quality Reform, but also the need to internationalize HE and contribute to the efforts of establishing the EHEA. Bologna provided an external reference point with an authoritative status for degree structure reform and helped simplify the choice between a range of possible solutions. The translation of a Europeanization process, in this case, was characterized by national policy makers using the European agenda as a menu of solutions for domestic problems.

Table 3. Europeanization mechanism models in Scandinavian degree reform

	External incentives	Social learning	Lesson drawing
DK	Comparability-secondary		European reform used to complete national reform
SE	Comparability-main	Discussion with HEIs.	
NO	Comparability-secondary	Discussion with HEIs.	European reform helped set the course for degree reform

Source: Author's study.

The convergence to European norms in terms of degree structure change resulted in the following outcomes: Danish HE remained relatively segmented, though some level of flexibility improved, particularly in the transition from professional programs. Short professional programs were integrated into the first cycle, thus opening some room for future transitions to more advanced degrees. Sweden, on the other hand, transformed its modular system to the more rigid three cycle system. Emphasis was previously put on the complete course, whereas after the reform focus shifted to the full degree, thus reducing some of the system's flexibility. Finally, in Norway, the new degree system enabled open transition between institutions and programs. Moreover, short programs were integrated into the first cycle, and holders of short-cycle qualifications gained full credit for their previous studies when continuing their education in the same field towards a Bachelor's degree.

According to the multiplier effect model, increased flexibility within educational institutions is most effective as concerns the educational prospects of second-generation immigrant youth, as they tend to take more advantage of structural features and indirect routes than their native counterparts. Consistent with the immigrant paradox theory, persons with an immigrant background are either over-represented or very close to an equitable representation in all three Scandinavian countries. However, a closer examination of participation trends within the cycles may suggest more complex participation patterns for immigrants and descendants.

Conclusion

In this paper, Scandinavian degree reforms have been explored. It may be concluded that the implementation of a new degree structure in Scandinavian HE was the result of various national agendas combined with the need to conform to Bologna standards. Each country's starting point and the level of misfit between the European reform and national policies determined the pace and process. A low level of misfit enabled a swift implementation of the reform and vice versa. Nonetheless, by 2007, all three had finalized their degree reform.

Europeanization in Norway, and even more in Denmark, served in part as a tool to reinforce ongoing domestic processes (Vaboe, & Aamodt, 2009, pp.

57–71). In such a setting, the lesson-drawing mechanism was applied. Nonetheless, in both countries, internationalization and European comparability played a significant role. In Sweden, on the other hand, the Bologna reform was the trigger for a degree structure change, which was otherwise not on the domestic agenda. Here, the external incentive model mechanism was applied as the need for comparability and the concern around future lack of recognition were the key reform rationale. This may explain the relatively late Swedish reaction. Coupled with the external incentive mechanism, the social learning model was applied to provide consensus for the reforms.

In sum, Europeanization processes in HE are adopted at a higher pace when domestic considerations are the primary rationale for the reform. Nonetheless, in all three countries, the reforms were also highly driven by the need to conform to European standards. Other objectives of the Bologna reforms may be reviewed to further the understanding of the mechanisms behind domestic versus Europeanization policies in HE policies.

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Degree reforms in Scandinavian higher education – intersection between Europeanization and national policies

European higher education (HE) systems have undergone wide-scale reforms during the first two decades of the millennium. Some were the result of national policies; others were the result of Europeanization and globalization processes. The purpose of this article is to further the understanding of the mechanisms operating at the intersection between national policies and the Europeanization processes in HE. The article focuses on the Bologna degree structure reform and its implementation in the Scandinavian countries.

At first, Europeanization definitions and related theories are reviewed, with emphasis on HE. The degree reform in Scandinavian HE is described and analyzed in the context of Europeanization reforms and national policies. Then, national approaches in the context of Europeanization perspectives are examined through a comparison of reform reasoning in Bologna and national documents and related articles. The analysis indicates that where national agenda was in accordance with Europeanization procedures, the implementation pace was higher, although eventually all three countries fully implemented the reform.

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Student Perception of Teacher Empathy, High Regard and Genuineness and the Impact on Student Engagement

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As the discussion of e-learning and its related research progresses, researchers continue to study the effectiveness of online higher education. Those who critique online teaching and learning indicate that there is a potential disconnect between the instructor and the students, as well as among the students (Reese, 2015, pp. 579–588), because of the limited amount or non-existence of face-to-face contact. As a result, both online students and teachers may be left feeling a lack of engagement and interaction at times. To mitigate this potentiality, online teachers must use a variety of teaching, assessment and design methods that facilitate engagement and learning.

When students do not feel connected to the teacher or with each other, their perceptions regarding the effectiveness of online learning are diminished (Aragon, 2003, pp. 57–68; Moore & Kearsley, 2004). If students feel little connection or relationship to each other, or to the teacher, their perceptions of the course's effectiveness and vibrancy are lowered. If relationships among students and with the teacher are supported, students feel safe to interact, thereby leading to more vibrant discourse. In fact, Richardson et al. (2012) acknowledged fewer options for visual observations and verbal interactions are readily available in many online classes. Limited visual prompts have the potential to limit interaction among students and with the teacher. Additionally, students tend to feel more engaged and are less likely to drop online classes if they feel a connection to or are close with the teacher (Richardson, Arbaugh, Cleveland-Innes, Ice, Swan, & Garrison, 2012, pp. 97–125). As Motschnig-Pitrik (2005, pp. 503–530) explained, addressing the whole person within the learning environment, be that brick and mortar, blended or virtual, is widely documented in the literature.

Review of related literature

In an effort to bridge this gap, consideration of how interpersonal relationships develop might be helpful. Perhaps the most widely researched model describing the essential conditions for the formation of relationships is Roger's Person-Centered Theory. The Person-Centered Model of relationship development was developed, implemented and studied by Carl Rogers during the late 1960s. Roger's theory was initially an explanation of how to build a relationship between a counselor and a client, and is not to be mistaken for the student-centered teaching model within the field of education. The student-centered teaching model sets forth the importance of using more personalized teaching strategies driven by student needs. Roger's Person-Centered Model speaks to the building of the relationship between the client and the counselor. Today, Person-Centered Theory is widely taught within the field of counselor education. Rogers (1969) posited that in order for a safe relationship to develop between the counselor and client, certain conditions by the counselor must be established. These conditions are empathy, genuineness, and unconditional positive regard. Empathy is defined as "the emotional and cognitive ability to feel the problems or distress of another person combined with the desire to help or to relieve h/er distress" (Tausch & Hüls, 2014, p. 136). Genuineness comes from the counselor being authentic and transparent. Unconditional positive regard comes from accepting the client, regardless of his or her circumstances. Rogers conducted considerable research quantifying the effectiveness of his theory (Rogers, 1969).

Rogers later applied his theory to the field of education. At a core level, Rogers believed that all human beings deserved dignity and empowerment, offering each student empathy or understanding, congruence or genuineness, and valuing or prizing (Aspy & Roebuck, 1988, pp. 10–18). Further, Rogers (1969) and Rogers, Lyon, and Tausch (2014) maintained that learning is facilitated when the teacher uses empathy, genuineness and a high level of regard (i.e., the instructor's efforts to help students feel valued) to help the student(s) feel safe, trusted, creative and knowledgeable. Treating students with understanding, genuineness and high regard requires teachers to approach their students as co-learners, and to step away from the idea of teachers serving as the experts.

Empathy or caring helps students feel understood and supported. Yet, in the Tausch and Hüls (2013) study, some 60% of university-level students indicated they felt no empathy from their professors. Similarly,

Rogers, Lyon and Tausch (2014) found that students' feelings or emotions are rarely addressed in the classroom. They also found that students tended to be distrustful of the instructor when s/he was not aware of the students' internal feelings or reacted in a disingenuous manner toward them. If the teacher or facilitator was congruent or genuine when interacting with the students, they were prone to trust the facilitator. The third condition needed to positively affect the relationship between the facilitator and the student(s) is to maintain high regard for the student(s), so that the student(s) feel(s) valued and free to discuss the course content. When the Student-Centered approach is integrated into an online learning environment and is modeled for the students, they are likely to feel more comfortable utilizing similar strategies when they interact with the facilitator and with other students. In addition, as the facilitator models and uses empathy, genuineness and a high regard while interacting with the students, they feel emotional safety, freedom, engagement and curiosity, which become the pillars of support needed to move to a deeper level of learning (Rogers, Lyon, & Tausch, 2014).

According to Motschnig-Pitrik (2005, pp. 503–530), despite the fact that teaching approaches used in face-to-face classrooms cannot always be used in online classes, advances in technology make conveying empathy, genuineness and a high regard easier. For example, using Skype allows the facilitator and the student(s) to meet virtually, which in turn offers opportunities to convey a broader range of emotional and non-verbal behaviors, such as smiles and frowns. Such virtual "face-to-face" meetings also allow for more collaborative assignments, providing additional opportunities for the students to engage with each other and with the facilitator.

Using teaching strategies geared toward creating a collaborative and highly interactive environment can further increase student engagement and motivation. O'Sullivan, Hunt and Lippert (2004, pp. 464–490) argued that, when a facilitative exchange between the student and the facilitator or teacher was maintained, students were more motivated and engaged. Embedding Rogers' three conditions or values of empathy, genuineness and high regard, which facilitate emotionally safe learning, has the potential to increase the number and diversity of interactions and to allow students to demonstrate initiative, which in turn may result in deeper learning, problem solving, spontaneity and creativity (Motschnig-Pitrik, 2005, pp. 503–530).

Brooks and Young (2015, pp. 515–527) found that timely responses to student questions and overall teacher availability were critical to a more facilitative relationship between the student and teacher. Prompt responses to each student help the student feel important, highly regarded and understood. In other words, demonstrating empathy, genuineness and a high regard for the students in the course design and facilitation can be instrumental in developing student motivation and learning. It follows that when

motivation is increased, online students become more interactive with each other and with the facilitator, which may have a circular effect of further increasing motivation and engagement.

With these connections, the possibility of creating community in a virtual classroom may be increased. The creation of community and the ability of students to function within this community are essential to developing the skills and competencies needed to function in the 21st century. According to Reese (2015), these skills and competencies include "cultural and worldly awareness, self-direction, risk taking and creativity, communication, reflection" (pp. 579–588), as well as application of knowledge to their respective disciplines. When the online environment is emotionally safe, students have the potential to be more engaging and to feel more challenged and motivated to learn 21st century skills and competencies (Motschnig-Pitrik, 2005, pp. 503–530).

Although Fuller (2012, pp. 38–48), Handelsman, Briggs, Sullivan, and Towler (2005, pp. 184–192), Rogers, Lyons, and Tausch (2014) and Tausch and Hüls (2013) found that many studies discussed the needs and benefits for teachers to express empathy for their students and to foster the student-instructor relationship, limited research was conducted regarding students' perception of their teacher's empathy, genuineness and level of regard as it relates to engagement. The current literature of online learning has conceptualized some of the interpersonal factors described above. Dixson (2012, pp. 1–13) found that increased communication between the student and teacher is related to increased engagement. Motschnig-Pitrik (2005, pp. 503–530) discussed Roger's (1969) three core conditions in the context of motivation, but not specifically in the context of engagement. According to Mandernach (2015, pp. 1–14), researchers have difficulty measuring engagement. Moreover, the association between Rogers' (1969) main constructs/core conditions and online student engagement remains unknown in the existing literature. This study is an effort to understand the characteristics of the targeted populations and to fill the gaps in the literature by empirically assessing and exploring whether a relationship exists between engagement and the instructor's ability to communicate empathy, genuineness and high regard.

Methods

Data

All participants were undergraduate or graduate students from a Midwestern university in the United States. The subjects of the study were students who had taken at least one online course regardless of whether s/he is a 'pure' online student or an on-campus student. The subjects were recruited by posting a campus-wide online announcement and visiting a variety of classes. 185 students completed an online survey hosted by the University of Illinois Web Services.

Table 1. Brief Description/Explanation of Each Variable and Examples of Corresponding Survey Questions

Variables	Brief Description/Explanation	Sample Survey Questions	Instrument
Empathy	Helps students feel understood & supported	• Teachers see what students mean (or are trying to say) and how they are feeling as they say it	Barrett-Lennard Relationship Inventory (BLRI)
Genuineness	Prone to trust facilitator or teacher	• Students feel that teachers are genuine – talk to them straight	
Level of Regard	Helps students feel valued	• Teachers respect students Teachers are concerned and care about students	
Skill Engagement	"Student engagement through practicing skills"	• Taking good notes when studying class materials Staying up on the readings	Student Course Engagement Questionnaire (SCEQ)
Emotional Engagement	"Student engagement through emotional involvement with the class material"	• Really desiring to learn the material Applying course material to my life	
Interaction Engagement	"Student engagement through participation in class and interactions with instructors and other students"	• Interacting or helping fellow students Posting questions on course site	
Performance Engagement	"Student engagement through levels of performance in the class"	• Getting a good grade Doing well on tests or quizzes	

Source: BLRI: Barrett-Lennard (2015); SCEQ: Handelsman, Briggs, Sullivan, and Towler (2005).

Variables and Measurements

The researchers used two validated instruments from Barrett-Lennard Relationship Inventory (BLRI) and Student Course Engagement Questionnaire (SCEQ) to measure Carl Rogers' core conditions and four factors of student engagement. Table 1 provides a brief description and explanation of each construct or element of the BLRI and SCEQ with corresponding examples/survey questions.

Barrett-Lennard Relationship Inventory (BLRI): The 40-item form was developed by Godfrey T. Barrett-Lennard to assess Roger's core conditions, including empathy (10 items), genuineness (10 items), and level of regard (10 items). All items are measured on a six-point Likert scale, ranging from +3 (YES, I strongly feel that it is true) to –3 (NO, I strongly feel that it is not true). The higher the score, the stronger the perception is of a more positive experience in online courses or better relationship with instructors.

Student Course Engagement Questionnaire (SCEQ): The original student engagement questionnaire was developed by Mitchell M. Handelsman, and evolved into four factors of student engagement, including skill engagement (nine items), emotional engagement (five items), participant/interaction engagement (six items), and performance engagement (three items).

All items are measured on a five-point Likert scale, ranging from 5 (very characteristic of me) to 1 (not at all characteristic of me). The researchers adapted some questions to fit online learning environments. The higher the score, the stronger the student engagement is. Table 2 contains the adapted survey questions.

Table 2. Adapted Student Course Engagement Questionnaire (SCEQ) for Online Environment

Factor	Survey Question
Skill Engagement	• Doing all the homework problems • Visit online course site multiple times each week • Taking good notes when studying class materials (e.g., PowerPoint presentations, lecture videos) • Looking over class notes between accessing the course site to make sure I understand the material • Putting forth effort • Being organized • Staying up on the readings • Making sure to study on a regular basis • Studying course materials carefully
Emotional Engagement	• Thinking about the course between course modules • Finding ways to make the course interesting to me • Really desiring to learn the material • Finding ways to make the course material relevant to my life • Applying course material to my life
Interaction Engagement	• Posting questions on course site • Participating actively in online class activities (e.g., online discussion, collaborative activities) • Asking questions when I don't understand the instructor • Emailing or calling or meeting the instructor remotely with questions about assignments or tests or course related questions. • Having fun in class • Interacting or helping fellow students
Performance Engagement	• Being confident that I can learn and do well in the class • Getting a good grade • Doing well on tests or quizzes

Source: Chen (in press)

In addition, demographic variables were developed by the researchers to examine the students' characteristics, to learn more about the population. Admission status was coded as online or on-campus. Sex was coded as men or women. The researchers also included four major categories: social science (e.g., psychology, education), natural science (e.g., biology, chemistry), humanities (e.g., English, history, communication), and business & technology (e.g., computer science). The number of online courses that participants had taken was categorized into six groups: 1, 2, 3, 4–5, 6–10, and more than 10.

Statistical Analysis

All data collected were analyzed using IBM SPSS version 24. Correlational analyses were conducted to examine the relationship between levels of empathy/genuineness/level of regard and the four factors of online student engagement.

Results

Of the 185 students who completed the online survey, 129 (70%) were female and 54 (29%) were male. The descriptive statistics results also show that 58% of students' majors were in the category of social sciences (e.g., psychology, education). In addition, approximately 80% of participants have taken at least two online courses. Table 3 provides more details regarding the demographic and other key variables.

The mean scores and standard deviations of survey items from the participants are tabulated in Table 4. The results reveal that all variables are positively and directly correlated, except genuineness and skill engagement. According to Davey, Sterling, and Field (2014), the Pearson correlation coefficient (r) may serve as a reliable effect size measure and has a convenience range between 0 (no effect) and 1 (a perfect effect). Cohen (1992, pp. 155–159) and Davis (1971) made widely used suggestions about what constitute a medium effect ($r = 0.3$–0.5) or a small effect

Table 3. Descriptive Statistics of Study Population ($n = 185$)

Variable	n (%)
Are you currently:	•
an online student	62 (34%)
an on-campus student	123 (66%)
Sex:	
Female	129 (70%)
Male	54 (29%)
In what field are you pursuing your degree?	
Social Science (e.g., psychology, education, & etc.)	108 (58%)
Natural Science (e.g., biology, chemistry, & etc.)	18 (10%)
Humanities (e.g., English, history, communication, & etc.)	17 (9%)
Business & Technology (e.g., computer science, & etc.)	42 (23%)
How many online courses have you taken?	
1	39 (22%)
2	24 (13%)
3	21 (11%)
4–5	39 (21%)
6–10	29 (16%)
More than 10	33 (18%)

Source: Chen (in press)

($r = 0.1$–0.3). In other words, a higher correlation coefficient represents a higher effect or a stronger relationship.

The highest correlation was observed between the level of regard and interaction engagement ($r = .44$, $p < .001$), followed by empathy and interaction engagement ($r = .43$, $p < .001$). Emotional engagement

Table 4. Correlation Matrix – Barrett-Lennard Relationship Inventory & Class Engagement

	1	2	3	4	5	6	7
1. Empathy	–						
2. Genuineness	.69***	–					
3. Level of Regard	.88***	.68***	–				
4. Skill Engagement	.26***	.11	.18*	–			
5. Emotional Engagement	.31***	.20**	.31***	.61***	–		
6. Interaction Engagement	.43***	.22**	.44***	.59***	.60***	–	
7. Performance Engagement	.27***	.16*	.21**	.46***	.44***	.43***	–
Mean	42.86	38.25	44.43	4.13	4.05	3.77	4.40
Standard Deviation	9.88	8.08	10.22	6.07	3.76	4.34	1.82

*$p < .05$. **$p < .01$. ***$p < .001$.
Source: Chen (in press)

was also associated with the level of regard ($r = .31$, $p < .001$) and empathy ($r = .31$, $p < .001$). Although significant, there were relatively weak associations between genuineness and the following three factors of student engagement: emotional engagement, interaction engagement, and performance engagement ($r = .20$, $p < .01$; $r = .22$, $p < .01$; $r = .16$, $p < .05$, respectively). Similarly, the association between the level of regard and skill engagement was weak ($r = .18$, $p < .05$) and the strength of the association between the level of regard and performance engagement was small ($r = .21$, $p < .01$). Empathy was significantly associated with skill engagement and performance engagement ($p < .001$), although the strength of correlations was weak ($r = .26$; $r = .27$, respectively). Finally, genuineness and skill engagement were not related ($r = .11$, $p > .05$).

Discussion

Due to these connections, the possibility of creating community in a virtual classroom may be increased. The creation of community and the ability of students to function within a community are essential to developing the skills and competencies needed to function in the 21st century. According to Reese (2015), these skills and competencies include "cultural and worldly awareness, self-direction, risk taking and creativity, communication, reflection" (p. 579) and application of knowledge to their respective disciplines. When an emotionally safe climate is established, students have the potential to be more engaged and feel more challenged and motivated to learn 21st century skills and competences (Motschnig-Pitrik, 2005, pp. 503–530).

The results of the study suggest that Rogers' characteristics of empathy, genuineness, and high regard are related to the engagement variables. With the exception of genuineness and skill engagement, all of the bivariate correlations between Rogers' characteristics and the engagement variables were statistically significant. That is, empathy and high regard were significantly related to all four of the engagement variables (i.e., skill, emotional, interaction, and performance), and genuineness was significantly related to emotional, interaction, and performance engagement.

Of the three Rogers' characteristics, genuineness had the weakest relationship to the engagement variables. This finding makes sense because genuineness is a trait that seems to be more passive and less interactive than either empathy or high regard. In other words, students' perceptions of an instructor's genuineness may be more difficult to assess, in contrast to empathy and high regard. The latter two variables are more actively conveyed within the student-instructor relationship; hence, we find stronger engagement.

While skill engagement and performance engagement are important indicators of student involvement, emotional engagement and interaction engagement are the most relevant variables in the context of Rogers' characteristics. The data support this as well: empathy and high regard had the most robust relationships with emotional and interaction engagement. It appears that significant aspects of empathy and high regard are captured in the emotional and interaction engagement variables. While this relationship is important, it also suggests that empathy and high regard exist as independent constructs. The unique role of empathy and high regard in the student-instructor relationship requires further research.

This study helps connect the existing engagement research with Rogers' characteristics of empathy, genuineness, and high regard. To date, online research has relied heavily on engagement variables to measure student-instructor relationships. Rogers' characteristics provide a more focused perspective on this relationship, examining fundamental relationship-building variables in the context of an online class.

Based on the results of this study, online instructors might consider using teaching and design strategies to enhance the teacher's level of empathy and regard for the students, which has the potential to result in a stronger relationship with each student. Rather than relying solely on a text-based presentation of the course content, instructors should consider using technology that allows for audio and video presentation. When dealing with complex suggestions or information, they could phone or Skype the student, so that their empathetic presence is more deeply felt. Another suggestion is to use audio recordings for student feedback, rather than solely relying on written text. If teachers do give written feedback, they should consider giving handwritten feedback using an iPad Pro or other tablet that allows writing directly on its screen. Teachers can also think about sending a brief welcoming email prior to the beginning of classes and responding to students who call within a reasonable time period, such as 24 to 48 hours. They should think in terms of what will help each student succeed. Teachers could embed a "tips for success" list into their class or syllabus, or create a blog or interactive chat room to discuss course content. They could use texting instead of email to communicate. These are only a few suggestions to help convey empathetic feedback and high regard toward each student. Remember that empathy and a high regard for students were shown to have a positive impact on engagement and student success.

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Student Perception of Teacher Empathy, High Regard and Genuineness and the Impact on Student Engagement

One of the main challenges for online instructors involves developing relationships with students. Current research in student engagement has conceptualized this process according to four areas: skill engagement, interaction engagement, emotional engagement, and performance engagement. In an effort to be more focused and to highlight the relationship-building aspect of engagement, the work of Carl Rogers can be applied in these settings by emphasizing empathy, genuineness, and high regard. This study sought to examine the relationship between student engagement and these Rogerian characteristics. Students (n=185) completed an online survey that included the Student Course Engagement Questionnaire and the Barrett-Leonard Relationship Inventory. The results demonstrated that empathy and high regard were significantly correlated with all four engagement areas, and genuineness was significantly correlated with three: interaction, emotional, and performance engagement. As hypothesized, empathy and high regard exhibited the strongest relationships with interaction engagement and emotional engagement. These findings suggest that student engagement (interaction and emotional) does capture aspects of these relationship-building variables. It also suggests that more can be done to measure and implement empathy, genuineness, and high regard skills in online teaching for more effective instruction.

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WE RECOMMEND

10 Trends transforming Education as We Know It
EPSC Report

The European Political Strategy Centre (EPSC) is the European Commission's in-house think tank, which mandate includes strategic analysis and policy advice. The report published by the Centre in November 2017 indicates the major trends transforming contemporary education from early childhood to the university level. In the document the already ongoing changes as well as the challenges implied mostly by the proliferation of new technologies are listed.
Full report can be downloaded from: **https://ec.europa.eu/epsc/publications/other-publications/10-trends-transforming-education-we-know-it_en**

3rd World Conference on Blended Learning (IABL2018), 18–21 April 2018, Warsaw, Poland

The 3rd World Conference on Blended Learning is organized by the International Association for Blended Learning (IABL) and Institure of Applied Linguistics University of Warsaw (ILS UW). The conference organizers cordially invite researchers, teachers, professors, administrators, trainers and technology experts to present the latest blended learning solutions as well as to discuss and exchange the latest findings and new ideas based on the ongoing research, practice, and experience. The organizers would like to invite contributions from across the globe, from all educational sectors and a broad variety of industries.
More information: **http://iabl2018.org/**

The Role of Municipal Websites Within Rural Illinois Municipalities

Ty Price Dooley

The sheer size and scope of the Internet has had a tremendous impact on municipalities around the world. Local governments initially saw the Internet as a simple repository of information that could be used to distribute information to the public. That perspective evolved into what has become a complex system of tools that local governments can leverage, to not only enhance the distribution of information to the public, but also to provide a whole host of opportunities that both the public and business sectors can use to engage interactively with local government.

While the literature on e-government adoption is extensive (Srivastava, Ray, 2016, p. 1; Norris, 2009; Moon, Norris, 2005, pp. 43–60) most studies have focused on e-government from the perspective of the public (Anthopoulos, Reddick, Giannakidou, & Mavridis, 2016, pp. 161–173; Norris, & Reddick, 2013; Cordella, & Iannacci, 2010, pp. 52–66; Layne & Lee, 2001, pp. 122–136; Moon, 2002, pp. 424–433). Very few studies have examined the specific decision-making processes involved in a municipality's selection of a website and the tools that would be deployed. Moon and Norris, in their 2005 study, found that the size of a municipality and the ability to be innovative were significant predictors of website adoption (Moon & Norris, 2005, pp. 43–60). This paper outlines the advantages and difficulties of municipal website implementation and maintenance by examining rural Illinois municipal web presence and explores preferred policy actions for those communities.

The state of Illinois has the 5th largest economy in the United States, with a Gross Domestic Product (GDP) of $776.9 billion (United States Department of Commerce, Bureau of Economic Analysis, 2016). To put that into perspective, the economy of Illinois is larger than the economy of the Netherlands. Thus, issues related to development can have a profound impact not merely within the state, but across the United States and globally. Rural municipalities in Illinois that fail to have an Internet presence as a communication tool fail to take advantage of an affordable means to communicate with residents, stimulate economic development, promote tourism, and present their community as progressive and sustainable. Ultimately, these communities are a drag on the Illinois economy. According to the Illinois Institute of Rural Affairs, "small rural communities of fewer than 4,000 residents are at a strong advantage, related to development, if they have a solid Web presence" (Schuytema, 2007). Although large local governments are more likely to have a website, many small local governments are also taking advantage of the Web despite their lack of financial and technical resources (Cassell & Mullaly, 2012, pp. 91–100).

Background

The history of e-government can be traced back to the adoption of information technologies by large urban centers in the 1950s and 60s, when mainframes and other computing technologies first became commercially available (Moon & Norris, 2005, pp. 43–60). Those technologies enhanced efficiencies and assisted with the basic functions of service delivery and innovation. Federal investments in public sector municipal website development also played a significant role (Moon, 2002, pp. 424–433). Our modern notions of e-government, as illustrated by the municipal website, owe their use and deployment by cities to the rapid growth and popularity of the Internet in the late 1990s and early 2000s. Emerging from this era, municipal website functionality evolved from simple content delivery, including both transaction processing and stakeholder engagement (Layne & Lee, 2001, pp. 122–136).

E-government is defined as the delivery of information and services by municipal governments through the Internet (West, 2001). Community development services range from the posting of municipal revenue information, such as tax rates, on the municipal website, to the inclusion of information on city forms, information on utilities, and enterprise zones. The impact of e-government as an effective means of community development should not be understated. In a survey of 286 municipalities in Illinois, 58.7 percent of respondents viewed web-based technology as an important or very important element of community development (Johnson & Walzer, 2005). In data obtained from the same survey of Illinois communities, only 70 percent of rural municipalities had a website,

Exhibit 1. Municipal Web Presence in Illinois
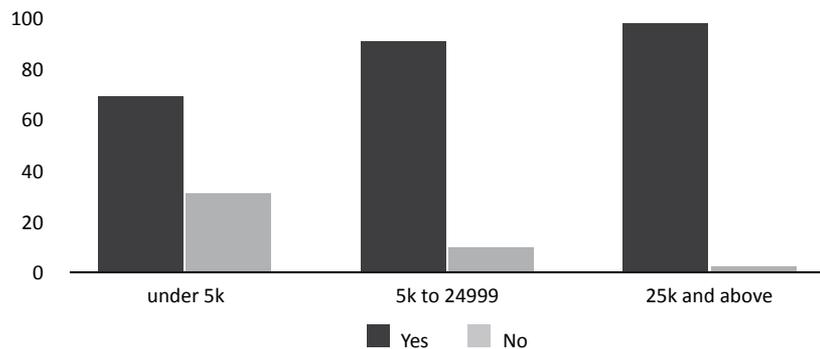
Source: Author's original graph.

while more than 90 percent of all other municipalities in the state had their own web presence.

Merely having a web presence is not the only distinguishing characteristic. The form of web presence utilized by municipalities is equally important. Beyond the standard characteristics of a basic website, web presence types include engaging in social networking and sharing various resources and artifacts – print, audio, video (Lowenthal, Dunlap, & Stitson, 2016, pp. 320–329). Layne and Lee (2001, pp. 122–136) classified municipalities into stages, based on the type of web presence utilized. In order of sophistication, the stages consisted of:

1) catalogue – having an online presence with downloadable forms.
2) transaction – engage in basic online transactions (such as bill pay).
3) vertical integration – connect local services to state and federal databases.
4) horizontal integration – link various municipal services in one place online.

Exhibit 1 details the extent of web presence in Illinois municipalities across population types.

Context and Importance of the Problem

State government actions, business relocation, environmental mandates, declining infrastructure, rising employee benefits costs, and a declining or stagnant tax base typify the challenges rural cities face in the state of Illinois. Rural communities in Illinois, like others across the country, tend to have a competitive disadvantage when compared with urban centers (Wilkinson, 1999, p. 94) relative to economic development. One disadvantage that rural municipalities can face would be the lack of adequate infrastructure, including technology (Siegel & Waxman, 2001, pp. 1–38). When examining municipal websites nationally, rural municipality websites, typically, are updated less frequently, and are more difficult to navigate, which makes them less usable for clients and prospective clients (Scott, 2005, pp. 151–165). This can leave rural communities at a disadvantage when trying to compete successfully for private industry (Siegel & Waxman, 2001,

pp. 1–38). This competitive disadvantage can lead to higher rates of unemployment and underemployment, coupled with low per capita income and limited employment opportunities (Duncan, 2000). This overall lack of resources tends to lead to reductions in overall levels of community capacity, characterized by an under-trained human capital base (Siegel & Waxman, 2001, p. 11).

This leads to the question: what role can a municipal website play in enhancing the social, economic, and political environment within rural Illinois cities? Municipal websites play an important role in serving citizens by providing quicker access to offerings, regardless of location, time, or physical limitations (Feeney & Brown, 2017, pp. 62–74; Thomas & Streib, 2003, pp. 83–102). However, smaller municipalities are less likely to leverage the web as an affordable communication tool. Even though the web has become an essential means to transmit information and promote commerce, small governments may avoid utilizing it for a number of reasons, including limited staff, lack of technical knowledge, lack of financial resources, and legally mandated website posting requirements (Moon, 2002, pp. 424–433). Although these reasons are legitimate, the availability of cost-efficient web development and maintenance resources, in addition to sources that provide a comprehensive list of mandated posting requirements, make implementation of a website more attainable.

A study conducted in Northeast Ohio found that urban communities and community education levels were statistically significant influences related to community website implementation. From this study, one can deduce that rural communities populated by citizens with lower education levels are less likely to implement a website. However, a recent municipal e-governance survey indicated that as more people become familiar with using technology and social networks to communicate, and the cost of technology decreases, the digital divide is likely to decline along economic and educational lines (Holzer, Fudge, Shick, Stowers, & Manoharan, 2012).

Once a municipal website is implemented, opportunities exist for a city to leverage economic

development opportunities to promote the community to businesses. This can be done through postings related to economic incentives such as Tax Increment Financing (TIF) and Enterprise Zones. The city's existing tax structure can also be communicated. Additionally, the municipality can coordinate and mobilize the local community for the consideration of Home Rule Tax referendums.

Measures

The decision-making process for a small city to transition from no web presence to the construction and maintenance of a website can be a daunting task. This section provides an overview of how municipal web presence policy options are analyzed. Key indicators are presented in scorecard format. Scorecards can be a useful tool for monitoring and forecasting impacts of policy decisions (Dunn, 2012, p. 24). Combined, the four indicators provide a broad, integrated assessment of whether the adoption of a web presence for a municipality is appropriate. The indicators are practicality, cost, implementation, and operation.[1] The indicators will assess the policy options. The assessment protocol for each indicator is either positive or negative. The four policy options include:

1) doing nothing and continuing to operate without a website,
2) utilizing a contracted service provider for initial website development with limited support, training, and maintenance required by the municipality,
3) contracting a service provider for website development with full support and maintenance,
4) contracting or hiring an IT professional to design and maintain a website.[2]

These policy options are evaluated based on criteria related to practicality, cost, implementation, and continued ease of operation. They are listed in Exhibit 2, detailed below.

Discussion

Discussion Main Point: Contracting a Service Provider for initial website design and limited support is the preferred option.

Based on the preselected criteria, three of the policy options evaluated resulted in two negative outcomes and two positive outcomes. The second option, utilizing a contract service provider for initial website deployment and limited client support relative to operation, resulted in three positive outcomes and one negative outcome. The second option is the preferred option. It allows for the initial design and deployment of the website. This option also allows the municipality to have direct access to the website, which ensures that information can be uploaded in a timely manner. This is especially important when it comes to legally mandated posting requirements and emergencies. Although municipal employees will have to assume the responsibility of building the website, this option, typically a design template, would make the task manageable for employees with limited technical knowledge. Considering practicality, cost, implementation, and continued ease of operation, utilization of a contract service provider with limited support is the recommended policy option for rural communities with limited capacities and resources.

Not recommended is the status quo policy option. Continuing to operate without a municipal website denies a municipality the opportunity to benefit from an affordable and advantageous resource. Additionally, the positives associated with the do nothing policy option are a lack of cost and no increased workload. Upon further evaluation of other policy options, website costs and increased workloads should be minimal once implementation is complete; therefore, these criteria hold less value when associated with this policy option.

The final two policy options are both feasible; however, contracting or hiring an IT professional for a rural Illinois municipality, in light of revenue constraints, might not be financially feasible. Because of the small size of most rural Illinois communities, it may also be difficult to find a qualified individual for this role. Furthermore, the utilization of a contract service provider with full support would be cost-prohibitive for a number of rural communities. Moreover, possible delays in updating the website, particularly during emergency situations, could be problematic.

Findings

Finding 1: Implementation requires a financial commitment.

Rural communities must embrace and review the digital infrastructure of their community's ongoing budget (Schuytema, 2007, p. 7). Once the community sets a budget for the implementation and continued operation of its website, it must designate qualified personnel to build the community's website using the platform's design template. This may require

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[1] Practicality refers to the sensible, reasonable, viable selection for the proposed policy option. Cost is measured by the actual monetary costs that the municipality would incur for the services provided. Implementation refers to process that the municipality would follow in order to implement the policy option. Operation refers to the ongoing resources that would need to be deployed by the municipality to maintain the website.

[2] Utilizing a government-specific website platform with population-based pricing was not included in the assessment due to difficulties in determining a fixed cost, because of substantive variance in population distribution among rural communities in Illinois.

Exhibit 2. Policy Options for Municipal Website

Policy Options	Practicality (P)	Cost (C)*	Implementation (I)	Operation (O)	P C I O	Practicality Cost Implementation Operation
Status Quo	Maintaining the status quo prevents the municipality from taking advantage of an affordable means to communicate and promote itself	No cost	No action required	Non-website related means of communication are time-consuming, not conducive to providing information, and one-way	P C I O	Negative Positive Positive Negative
Contract Service Provider w/Limited Support	The platform is designed to assist municipal employees with building a website with limited technical knowledge. Design can also be conducted by the company for a fee	$500 for design and $50 for monthly maintenance ($1100 annually)	Employees, who have limited time to take on new responsibilities, would have to invest time to upload information to the platform	Employees would have direct access to the website and be able to upload information immediately	P C I O	Positive Positive Negative Positive
Contract Service Provider w/ Full Support	Service provider would completely design and maintain the municipal website	If the city designs the website using the platform the initial cost is $35,000 for licensing and startup. Annual costs are $5,000	The service provider would both design and update the website. Municipal responsibility would be limited to the sending of updates and information to the service provider, so that the website could be updated	Employees may or may not have direct access to the website. Information would need to be transmitted to the service provider	P C I O	Positive Negative Positive Negative
Contract or Hire IT Professional	An in-house professional, by either contract or hire, would allow for local oversight and access. However, because of the small size of rural municipalities, it may be difficult to find or attract an IT professional for this role	Contract rates are not known; however, they are estimated to be similar to the salaried market rates for IT professionals	The IT professional would design the website with the city's assistance	The IT professional would update information under the municipality's direction (contractual or employment terms should specify the required time-frame for posting information)	P C I O	Negative Negative Positive Positive

* Service costs were obtained via internet website review or phone surveys of the city clerk's offices for 44 towns and villages. These include: Anna, Atlanta, Auburn, Aurora, Barry, Bloomingdale, Bradford, Cairo, Chatham, Collinsville, Cuba, Diamond, Decatur, Elgin, Evanston, Farmington, Galva, Glen Carbon, Grayville, Henry, Jacksonville, Jonesboro, Leland Grove, Marengo, Mechanicsburg, Minonk, Mahomet, Moline, Morrison, Mount Pulaski, Naperville, Normal, North Aurora, Oswego, Poplar Grove, Sesser, Shorewood, Springfield, Staunton, Troy, Wamac, White City, White Hall, Wyoming. Additional information was obtained from a review of 8 contract service providers (Revize, GovOffice, Just In Time Design, Town Web Design, Civic Plus, Weblinx, CreativeCore, Media by Marta).

Source: Author's original scorecard.

temporarily shifting duties from one employee to another, in order to allow for the required initial time investment for uploading information to the website. The community should consider appointing a temporary committee to determine the information that it wishes to display on the website, and to oversee the initial design. However, the municipality should caution against involving too many stakeholders in this process, since this can complicate and inhibit implementation (Schuytema, 2007).

Finding 2: One or two employees should be designated to oversee and maintain the municipal website.

There are numerous legally mandated posting requirements. These requirements are collectively displayed on Illinois Policy's website (Ruckman, 2014). It is important for the municipality to assign specific employees to review posting requirements periodically, in order to ensure compliance. In addition, employees who post to the website must clearly understand their roles regarding posting responsibility. For instance, the clerk might be responsible for posting the board agendas and meeting minutes, while the treasurer might be responsible for posting the audit report disclosure.

Finding 3: In order to avoid stagnancy, it is suggested that a committee evaluate the website annually.

A website with sparse out-of-date information or a community calendar without community events convey a very negative image of a community. Furthermore, when a website does not provide visitors with relevant and up-to-date information, the public will not use it, and therefore it becomes a poor investment for the community.

Finding 4: The municipality should develop a policy for web conduct.

This ensures that employees clearly understand the information that public officials wish to share on the municipal website, avoiding the potential for inappropriate or uninformed posts.

Best Practices

The goal of this section is to discuss common features of effective municipal websites in Illinois. Setting up and maintaining a website demands significant resources. Following some basic best practices can protect that investment. There are a number of different features that represent innovations for municipal website deployment. A clear pattern can be found in the analysis. Rural Municipalities that adopt structures establishing responsibility for civic engagement are followed by significant increases in interaction and website activity. Websites that contain specific links that target public stakeholders through education and feedback tend to promote more interaction and engagement. With the advent of modern social media platforms, these types of interactions are expected by citizens.

The best practices chosen here focus on those aspects of municipal websites that are visible to both public and private sector stakeholders.

1. Provide updated information for important events in the city: social media links, updated events, and archives of city council meeting minutes.
2. Allow stakeholders to access to municipal services online.
3. Provide economic development information. Examples include city notices, tax information, and key economic and demographic data.
4. Use of video, city notices, and links to city services when possible.
5. Consistently update the website.

Conclusion

Rural municipalities in Illinois can benefit from the social, economic, and political advantages of website implementation. E-government can save time and money by reducing paperwork and decreasing demand on municipal employees, since it makes information electronically accessible, thereby improving municipal performance (Schwester, 2009). Not only is community information accessible to residents 24/7, it is also available to visitors, future residents, and consumers. A web presence can also help promote economic development. Companies and startups may use a municipality's website as a means to investigate the community. To attract business, industry, or visitors, a community must market itself beyond its geographic boundaries. An Internet presence is an affordable means for a community to present itself to companies looking to expand. Additionally, citizens who do not attend local board meetings are able to track government activity by reviewing agendas, minutes, and voting records. There is a positive effect on citizens' perceptions of their local government's accessibility when they have visited the government's website.

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The Role of Municipal Websites Within Rural Illinois Municipalities

Using data collected on 44 municipalities in the state of Illinois, in the United States, this paper examines the decision-making process that rural municipalities face relative to having a web presence. Although large local governments are more likely to have a website, many small local governments do not, due to perceived lack of both technical and capital resources. This study employs a cost benefit scorecard and finds that rural municipalities have affordable opportunities.

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INFORMATION FOR THE AUTHORS

ABOUT THE JOURNAL

E-mentor is an academic journal published both in printed (in 1200 copies distributed for free) and in the open access electronic form. Throughout the last 14 years, it became a well-established peer reviewed academic journal, officially listed by the Polish Ministry of Science and Higher Education as one of the highest ranked (15 points) scientific journals. It is distributed to the numerous university libraries and other educational institutions, as well as to individual subscribers from academia and business. Due to the growing interest and number of submissions from other countries e-mentor is now becoming an international journal with certain editions published fully in English. Creating high quality, peer-reviewed content that is used by researchers, students and practitioners around the world remains our commitment and ambition.

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E-mentor is an academic journal established in 2003 as an open access magazine addressed to the e-learning professionals from Polish Higher Education institutions. Throughout the last 14 years, it evolved in the peer reviewed, academic journal, officially listed by the Polish Ministry of Science and Higher Education as one of the highest ranked (15 points) scientific journals. Due to the growing interest and number of submissions from other countries it is now becoming an international journal with certain editions published fully in English.

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