Autori: Antonia Bralić

Datum: 30.05.2019.

**A14.11.** Dissemination of project results on conferences and meetings, publishing of scientific papers, PhD thesis defense

A14.11. Diseminacija rezultata projekta na konferencijama i skupovima, objava znanstvenih radova, obrana disertacija

# D14.11.5. Literature review

# D14.11.5. Pregled literature

Contents

[1. Blended learning: definition and scope 2](#_Toc10547689)

[1.1. Benefits and challenges of blended learning 4](#_Toc10547690)

[1.2. Perspectives on blended learning 5](#_Toc10547691)

[1.3. Considerations when building blended learning environment 9](#_Toc10547692)

[2. Approaches to learning 16](#_Toc10547693)

[2.1. Definitions and scope 16](#_Toc10547694)

[2.2. Considerations on approaches to learning 18](#_Toc10547695)

[3. Approaches to learning in a blended learning environment 21](#_Toc10547696)

# Blended learning: definition and scope

Thorough changes in technology, educational practices, and society have impacted the development of learning supported by information and communication technology, also defined as e-learning. (Begičević & Divjak, 2006) define e-learning as “type of learning supported by information and communication technology (ICT) that improves quality of teaching and learning“. (Bolliger & Wasilik, 2009) claim that online teaching has become an expectation and an element of instructors’ regular teaching loads”, a fact that is still true today, ten years from publishing their work. Still, research has shown that e-learning alone often cannot address the needs and challenges of students, who prefer the face to face component of their learning experience, particularly when it comes to communication and building interpersonal relationships (Paechter & Maier, 2010). With that, researchers have been focusing on blended learning, its success factors, and impact it can make on students and teachers.

(Graham, 2006) states:

“The foundational challenge of blended learning research is seeking to understand (1) what humans do very well and (2) what machines do very well, so that the strengths of both can be maximized as they are blended in the service of learning. “

Knowing the above, blended learning has become the prevalent way of teaching in modern educational institutions, and yet, does not have only one definition. Generally, there is an agreement on blended learning involving a combination of face to face and online learning (Graham, 2013).

(Graham, Woodfield, & Harrison, 2013) highlight four key issues related to definition of blended learning:

1. **“What is being blended?”** In his previous work, (Graham, 2006) identified three most common answers to the question: blending online and face to face instruction (most commonly used), blending delivery media, and blending instructional methods.

2. **Seat time** - researchers have been debating whether defining a learning environment as blended automatically means reduced time in seat; i.e. less face to face time. This would mean that the online component is not simply added on top of traditionally taught courses but in fact replaces some of it.

3. **Proportion of online learning** - the question posed is: what proportion of a traditionally taught course must be online for it to be defined as a blended course? Having a threshold on a criterion that is not easily quantifiable is challenging; a difference in one percentage point might differentiate a traditional course from a blended one while in practice there might not be a significant difference in the way the course is delivered.

4. **Quality** - the transformational impact of new technology and way of teaching can only be achieved if it is implemented in a “thoughtful” way (Garrison & Kanuka, 2004). The challenge is to implement blended learning in a way that in fact advances the educational practice.

Here, the term “blended learning” is used to describe “learning activities that involve a combination of face-to-face interactions and technologically mediated interactions between students, teachers and learning resources” (Bliuc, Goodyear, & Ellis, 2007; Caravias, 2015). In fact, many blended learning programs today are built around traditionally taught courses now enriched with the online component, “leveraging the positive impact of blended learning on teaching and learning“ (Bralić & Divjak, 2018; Gilbert & Flores-Zambada, 2011; Morris, 2014; Sharpe, Benfield, Roberts, & Francis, 2006).

When analyzing blended learning in Croatian institutions, it is useful to look at the wider context of embedding information-communication technology in class and related findings. Ministry of Science, Education and Sport (MSES) and University Computing Centre (SRCE) conducted a national survey on applying ICT and e-learning technologies in educational processes in HEIs, between March and May 2013, results of which were made available to the research team of project “Development of a methodological framework for strategic decision making in higher education - a case of open and distance learning implementation”, analyzed and published in (Bralić, 2016).

Some of the key results include (Bralić, 2016):

* 76% of participating institutions’ governance says that the contribution of ICT to improving the educational process is crucial or essential
* Overall attitude of teachers towards the above is extremely positive or positive (64%)
* 83% of participating institutions’ governance feel that attitude of students towards e-learning is positive or extremely positive
* Majority of HEIs questioned do have an LMS in use. However, LMS usage varies between constituent units in different universities

However, “the emphasis in a Croatian HEI is still on the static component of e-learning (such as delivery of material) and often providing a supplement for traditional classroom teaching, rather than opening new aspects of teaching and collaboration that e-learning offers” (Bralić, 2016).

### Benefits and challenges of blended learning

The categorization of blended learning benefits is adapted from (Caravias, 2015) and expanded:

* **Greater flexibility of time** (when applicable and supported) (Bouhnik & Marcus, 2006; Demetriadis & Pombortsis, 2007; Sitzmann, Kraiger, Stewart, & Wisher, 2006), specifically in research on benefits of integrating MOOCs (Brahimi & Sarirete, 2015; Caravias, 2015; Edginton & Holbrook, 2010; Graham, 2006; Lock, 2006)
* **Time for reflection, freedom for students to express thoughts and ask questions** (Caravias, 2015; Chamberlin & Moon, 2005; Liaw, Huang, & Chen, 2007)
* **Meeting different needs and learning styles** (Caravias, 2015; Ho, Lu, & Thurmaier, 2006)
* **Reducing drop-out rates** (López-Pérez, Pérez-López, & Rodríguez-Ariza, 2011; Moskal, Dziuban, & Hartman, 2013)
* **Positive impact on performance, exam marks, and learning outcomes** (Baepler, Walker, & Driessen, 2014; Caluza & Funcion, 2018; Kiviniemi, 2014; López-Pérez et al., 2011; Means, Toyama, Murphy, Bakia, & Jones, 2009; Ravenscroft & Boyle, 2010; Sergis, Sampson, & Pelliccione, 2018)
* **Increased satisfaction and motivation to learn** (Baepler et al., 2014; Kim, Kim, Khera, & Getman, 2014; Kiviniemi, 2014; Klein, Noe, & Wang, 2006)
* **Increased faculty satisfaction** (Moskal et al., 2013)

When compared to fully online learning experience, blended learning brings the richness of interaction from the face-to-face part of the learning (Graham, 2006; Paechter & Maier, 2010; Tayebinik & Puteh, 2013).

It is important to acknowledge that blended learning, as anything, comes with a set of **challenges** that need to be addresses to ensure a good implementation and strategic benefits. For example, (Hogan & Mcknight, 2007) conducted a study on burnout among online instructors within a university and found that online instructors achieve “an average score on the emotional exhaustion subscale, high degree of depersonalization, and low degree of personal accomplishment“, indicating that the online element of the blended learning environment needs to be carefully examined in regards to the impact to teachers. Indeed, without a full institutional support, the full benefits of blended learning might go uncovered. Not all teachers have the possibility to introduce this format, depending on the type of content, available technology, time, and institutional support. To make a blended program work, it is necessary to have these aligned.

(Graham, 2006) has highlighted two areas of blended learning that require further attention: (1) student and faculty satisfaction with blended learning has been demonstrated in multiple studies, but more research is needed to connect the satisfaction with specific features of blended learning, and (2) flexibility and access are often cited as reasons for adopting blended learning but little research has actually quantified the impact of blended learning.

Finally, there is research that did not support the earlier mentioned claims on blended learning being the superior form of a learning environment. For example, (Price, Arthur, & Pauli, 2016) explored student satisfaction across online, hybrid, and traditional courses and found that there was no significant difference among these courses, in terms of the satisfaction and performance, which is unforeseen. The authors claim that it is possible that earlier studies that found hybrid comparing favorably with online courses were in fact showing differences in instructor, text, or course design. Similar result is obtained by (Olitsky & Cosgrove, 2014); results of their research on effect of blended coursework on student learning outcomes indicate no significant effects of blending on student learning.

### Perspectives on blended learning

Blended learning has been relatively well researched. Overview of previous research here is categorized in three groups: blended learning and its relation with (1) students, (2) institutions, and (3) faculty/teachers, as these groups tend to be main actors in building, deploying, leveraging, and evaluating blended learning environment. Similar classification has been shared by authors researching the frameworks for evaluating blended learning (Chmiel, Shaha, & Schneider, 2017).

#### Students

In previous sections, key benefits of blended learning for students were outlined: greater flexibility (when the course unit and curriculum structure among other elements allow it), time for reflection, meeting different needs and learning styles, reducing drop-out rates, positive impact of exams and marks, stronger learning outcomes, and increased satisfaction and motivation to learn.

Significant amount of research focused on elements and prerequisites that make a blended learning environment successful for students. Indeed, with its growing popularity, it is important to deeply understand why a blended learning environment is/would be a better solution than a traditionally taught course or a fully online learning environment. (Zhao, Lei, Yan, Lai, & Tan, 2005) compared the effectiveness of web based training and a blended course and found that the involvement of instructor in blended learning environment makes a significant impact on the effectiveness, making blended environment more favorable. Further, (Means et al., 2009) found that classes with online learning (either fully online or blended) on average “produced stronger student learning outcomes than did classes with solely face-to-face instruction“. Still, (Graham, 2006) who analyzed the above articles is rightly saying that it is unclear what aspects of instructor's role in these types of environments are most important.

Several authors emphasize the importance of communication and/or collaboration among students and teachers as one of the key elements in achieving learning goals, satisfaction, and/or creating a deep learning experience (Bates, 2015; Hacker & Niederhauser, 2000; Jones DeLotell, Millam, & Reinhardt, 2010; Lee & Rofe, 2016; So & Brush, 2008).

(Barnard, Lan, To, Paton, & Lai, 2009) built an instrument that measures “a student's ability to self-regulate their learning in environments that are wholly or partially web based“. Elements of this instrument are: environment structuring (time and place), goal setting, time management, help seeking, task strategies (strategy for approaching resolving a task), and self-evaluation (self-awareness, communication). There are several elements of self-regulation in this instance; all researched with the importance of self-regulation for students in learning contexts in mind, with significant paths.

Commonly mentioned example of integrating technology in learning processes is flipped classroom, with similar benefits for students. (Kim et al., 2014) define a typical flipped classroom approach as providing students the access to online materials prior to coming to class to ensure time spent in classroom is spent on higher-order activities. (Kim et al., 2014) have applied the Revised Community of Inquiry framework and analyzed three flipped classroom designs, showing different potential designs of a flipped classroom program. Research showed that students were overall satisfied with the activities, with many acknowledging the value of the class time interaction, as well as that “the flipped classroom activities were more student oriented than traditional class activities.” Further, (Sergis et al., 2018) investigated the impact of flipped classroom environment on students’ learning outcomes, as well as satisfaction and self-determination for their learning. They found that implementing the flipped classroom model lead to an increase in the cognitive learning outcomes of students, as well as that the students in the experimental group (exposed to flipped classroom) had significantly higher level of satisfaction and self-determination., compared to the control group.

Regardless of which technology is chosen for creating a blended learning environment or how it is built, the principles of building the environment for active learning and leveraging technology to meet the students' requirements, remain the number one priority (Bower, Dalgarno, Kennedy, Lee, & Kenney, 2015).

#### Faculty/teachers

(Fryer & Bovee, 2016) state:

“Perceived teacher support had a broad array of adaptive effects on future motivations for studying online.”

For teachers, the experience of implementing a blended learning environment, as well as their satisfaction with it, depends on several factors. (Chmiel et al., 2017) highlight several aspects important when evaluating blended learning, from a teacher’s point of view: faculty development, time investment, usability of tools, and quality of support.

(Bolliger & Wasilik, 2009) have studied faculty satisfaction with course redesign. Authors found that instructor-related factors (for example promoting positive student outcomes, recognition, intrinsic motivation, access to technology) directly impact instructor satisfaction but were less important than student related factors (for example student performance and satisfaction, interaction). The third set of factors, institutional factors (for example institution valuing the online teaching and has policies to support the faculty) had a low reliability in the study. (Vo, Zhu, & Diep, 2017) have studied the instructors' perceptions of elements of blended learning through a semi-structured interview and a questionnaire. Authors found that collaborative facilitation and general communication are more important when blended learning was more intensively implemented. There was no difference in the importance of blended learning components between hard and soft disciplines. However, there was a difference based on gender, with male instructors placing more importance to instructor-student interaction and feedback to groups (this can be biased because of a higher number of male instructors employing higher levels of blended learning in the sample).

Furthermore, the effort that a teacher has to put to build a blended learning environment and enrich the current learning practice is not insignificant, and the impact on teachers and instructors might be large, also mentioned in section on challenges with blended learning. Still, there are authors that worked on strategies for staff to implement the environment in a consistent matter and outlined that, in fact, “any short-term increase in workload can be offset by longer term efficiencies, along with potential improvements to student understanding and satisfaction (Willis, Kestell, Grainger, & Missingham, 2015).

#### Institutions

It is important to consider the role of an institution in the overall blended learning framework.

Significant changes in societal demands, funding, competition, technology, and student demographics pose a challenge to higher education institutions, administrators, and policymakers (Garrison & Kanuka, 2004). When observing blended learning as a means to enhance the teaching and learning process, a clear institutional policy and direction is needed to ensure its successful adoption (Garrison & Kanuka, 2004).

(Graham et al., 2013) list a few elements of blended learning structure within higher education institutions that impact the adoption and implementation of blended learning: technology, ownership, definitions and seat time, incentives, and evaluation. Same authors have also built the three stages of adoption of blended learning on institutional level: awareness/exploration, adoption/early implementation, and mature implementation/growth. The case made is that blended learning implementation often starts on faculty level. However, to truly benefit from the impact it can have on institution, teachers, and students, an institution level strategy needs to be in place, to address policy, structures, and support (Graham et al., 2013). Similarly, (Moskal et al., 2013) highlight that successful implementation of a blended learning program requires ”alignment of institutional, faculty, and student goals“ (...) “Operationalizing blended learning must resonate with the context of the institution and aligns with its goal and objectives while at the same time maintaining consistency with organizational capacity.”

(Betts, Hartman, & Oxholm, 2009) have laid out demographic and financial factors that are confronting colleges and universities in the United States of America (USA) that drive online and blended learning. Although some of these factors are related to specificities of the USA educational systems, some can be observed globally, such as demographic changes in student population, population shifts, diversity (for example gaps in attainment), increasing number of adult learners, global competition, and employment expectations.

(Weaver, Spratt, & Nair, 2008) have researched students’ and teachers’ use of a learning management system and found that, “due to a perceived lack of institutional support and adequate resourcing, many staff are forced to adopt a teacher centered approach in their online teaching.”

Finally, (Ginns & Ellis, 2009) conclude in their research that the more e-learning in general is integrated in the university structure, the more challenging it might become to identify which parts of the university correlate to the students’ perception on their experience with e-learning, showing again the importance of synergy and institutional strategy and action.

With this, it is clear that students, teachers, and institution have their own priorities, challenges, and interests in implementing blended learning and leveraging its power; these go hand in hand.

### Considerations when building blended learning environment

After reviewing the literature, there are several elements and phenomena that emerged in various research, across all three groups of stakeholders (students, teachers, and institutions); these were either ways of building and deploying a blended learning environment, or ways of assessing student experience with this type of learning environment.

Among other ways, blended learning environments can be created by embedding custom educational videos and off the shelf videos (for example massive open online courses) in curriculum. The created blended learning environment is often distributed through a learning management system. It is important to evaluate the experience with e-learning that students have, and address the challenges of controlling the learning experience as well as leveraging the advantages of online available resources.

With that, the following topics are here further considered.

From a technological standpoint:

* Educational videos
* Massive open online courses
* Learning management system

From users’ point of view:

* Experience with e-learning
* Learner control

#### Educational videos

When enriching the classroom teaching with online elements, instructors/teachers (from now on “teachers”) might decide to develop educational videos that are then made available to students. These videos can follow the curriculum and be an additional way for students to understand the content of the course unit and access all relevant information, potentially anywhere, any time. According to (Koumi, 2006), video can add value in education by leverage its distinctive strengths, grouped in three categories: assisting learning and skills development, providing experiences, and nurturing motivations and feelings.

For a teacher, it is important to consider three elements to make sure that the video is used effectively as an educational tool: managing cognitive load, maximizing student engagement, and promoting active learning from the video (Brame, 2016). (Kay, 2012) conducted literature review on use of video podcasts (includes multiple video files used in education) between 2002 and 2011, reviewing 53 articles. Key benefits of using video podcasts included: control over learning, positive attitudes of students (useful, helpful, stimulating, easy to use), and increased learning performance. (Kelly, Lyng, McGrath, & Cannon, 2009) have researched the use of educational videos developed for class in an undergraduate module and found that the overall feedback is that the videos are best used in conjunction with, not as a replacement for lecturer demonstration. Some core topics emerged from open ended questions and are aligned with other research highlighting the upsides and the challenges of using video in class: students highlighted the option to watch the content repeatedly until they can understand it, as well as learning/watching it in their own time. Students also mentioned the videos in context of preparation for class. One of the challenges students reported was not being able to ask questions, an observation that the authors use to support having a tutor/expert present (Kelly et al., 2009), which is also aligned with the benefits of having face to face time in blended learning setting, highlighted above. (Lloyd & Robertson, 2012) have studied the effect of screencast tutorials on learning outcomes and found “positive gains for students using a supplemental screencast tutorial in an undergraduate statistics course, especially on higher-order conceptual knowledge.”

(Brame, 2016) has laid out examples of ensuring high success with learning on video, along with key recommendations to maximize the benefits from educational videos, including: keeping videos brief and targeted on learning goals, using audio and visual elements to convey key messages, and using a conversational, enthusiastic style to enhance engagement. Similar guidelines were provided by (Thomson, Bridgstock, & Willems, 2014); to create an effective video, one must: give context and align purpose, tell a story, present with authenticity, and keep it short and to the point.

Some of the challenges in developing and using educational videos can be technical problems, some students having preference for lectures, and reduced class attendance in some cases (Kay, 2012). Further, developing, deploying, and updating custom material takes time and resources, both often limited in higher education world.

#### Massive Open Online Courses

In certain situations, integrating an existing material to enrich learning experience and achieve learning goals might be more prudent. Teachers have been incorporating massive open online courses (MOOCs) with more or less success in a traditional classroom setting to support various learning preferences, introduce this new way of learning to students, and to make learning available to those who might not be able to follow traditional instructions (Bralić & Divjak, 2018). Some of the benefits of creating a blended learning environment with MOOCs include “replaying lectures, augmenting or replacing secondary materials, filling gaps in expertise, exposing students to other styles of teaching and class discussion, reinforcing key skills, and teaching students how to teach online” (Griffiths, Mulhern, Spies, & Chingos, 2015). Further, including MOOCs formally in a traditionally taught course can help diminish downsides usually reported by researches, such as low completion rate (Koller, Ng, Do, & Chen, 2013).

Series of research describing the integration of a MOOC in a classroom course has been published in recent years (Bralić & Divjak, 2018; Bruff, Fisher, McEwen, & Smith, 2013; Firmin et al., 2014; Ghadiri, Qayoumi, Junn, Hsu, & Sujitparapitaya, 2013; Griffiths et al., 2015; Holotescu, Grosseck, Crețu, & Naaji, 2014), generally outlining good impact on students.

Recommendations on embedding MOOCs in traditionally taught course include (Bralić & Divjak, 2018):

* “sourcing several interesting MOOCs for students and allowing them to choose one they are most interested in, which positively affects motivation
* ECTS load should be carefully examined before suggesting and finalizing online portion of the content to ensure reasonable workload and expectations from students
* learning outcomes should be taken into considerations to properly connect online and offline learning and to create an environment that ensures achieving those outcomes
* if completion of a MOOC is required, it tackles the problem of high drop-out rates in online learning, which could also motivate students and empower them to complete further MOOCs. “

Objections to embedding MOOCs in class are various. Some research has found that teachers do in fact believe in the ability of technology to transform education but do not appreciate the commercial considerations of platform such as MOOCs (Brahimi & Sarirete, 2015), embedding material that was originally built as a standalone material carries its challenges, and finally, all the challenges of creating a blended learning environment are replicable when it comes to integrating MOOCs as well.

#### Learning management system

Learning management system (LMS) is a web-based application consisting of several tools that enable centralization and automatization of different aspects of learning (Morrison, 2003) in (Ćukušić & Jadrić, 2012). LMSs have multiple capabilities, including communication, content development and delivery, assessment, user management (Coates, James, & Baldwin, 2005). Many higher education institutions have implemented these systems to manage the learning processes, despite high complexity of this implementation. For example, one national research in Croatia showed that 75% of surveyed institutions does have an LMS (Bralić, 2016).

Based on (Coates et al., 2005) main drivers for LMS implementation include opportunities to:

* increase the efficiency of teaching
* enrich the learning experience for students
* address new student expectations
* stay competitive.

An existing challenge however is the fact that detailed analysis of ways in which an LMS is used and how it benefits the students and teachers on an institution level is often missing. Indeed, “it is vital to maintain the educational perspective rather than emphasize any technological determinism which takes specific characteristics of online systems or teaching for granted“ (Coates et al., 2005).

It makes sense therefore to include the use of these systems when analyzing blended learning environments as it is expected that a significant portion of developed blended learning environments are in fact built by leveraging the LMS.

(Weaver et al., 2008) surveyed teachers and students on the use of LMS in their institution and found that students reflect on the use of technology by teaching staff. For example, students who experienced a well-designed unit, feedback, and good interaction with staff reported a positive experience with the technology.

(Simeonova, Bogolyubov, Blagov, & Kharabseh, 2014) applied Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003) to identify and test the underlying factors influencing students' acceptance and use of Virtual Learning Environments (VLE): performance expectancy, attitude towards using technology, social influence, facilitating conditions, self-efficacy, and anxiety. (Raman, Don, Khalid, & Rizuan, 2014) have also looked at UTAUT and LMS use and found that performance expectancy, social influence, and facilitating conditions have positive effect on behavioral intention. Same results were obtained by (Ain, Kaur, & Waheed, 2015) whose research also supported the hypothesis on the influence of performance expectancy, social influence, and facilitating conditions on behavioral intention to use the LMS; authors have also introduced a new construct, learning value, to address the perceived value of LMS and also found that it influences the behavioral intention. (Saadé & Kira, 2006) have researched anxiety in regards to using an online learning system as a part of an extended technology acceptance model. Authors found that anxiety negatively influences the perceived ease of use of the online learning system as well as that students feel affect and anxiety in the same time when using the online learning system in mandatory setting. Findings of (van Raaij & Schepers, 2008) were similar: there is a direct negative effect of anxiety on perceived ease of use. This research is interesting because it includes and confirms positive effect of personal innovativeness in the domain of information technology on anxiety. (Chuo, Tsai, Lan, & Tsai, 2011) have also confirmed the influence of anxiety on perceived ease of use, as well as on perceived usefulness. Finally, (Alenezi, Abdul Karim, & Veloo, 2010) found that computer anxiety, among other predictors, significantly influenced the students' intention to use e-learning.

#### Experience with e-learning

E-learning, whether it is a custom educational video, a MOOC, or another mode, that has been embedded in building blended learning environments can have impact on other elements of learner journey. It is important to understand the complementary role of e-learning in students’ university experience and ensure there is appropriate place and contribution to developing student understanding (Ginns & Ellis, 2009).

(Ginns & Ellis, 2007) have researched the quality of e-learning, when online activities are used to complement face-to-face teaching and learning and outlined four distinct dimensions of an e-learning experience: good e-teaching, good e-resources, appropriate workload, and student interaction. Authors found that positive perceptions of key aspects of the learning environment tend to be correlated with deeper approaches to learning. Further, (Ginns & Ellis, 2009) have researched the matter further and explored combining the e-learning scale with the Student Course Experience questionnaire to evaluate the quality of student e-learning experience when learning is predominantly on campus.

(Kassab, Al-Shafei, Salem, & Otoom, 2015) have examined the relationships between different aspects of students’ course experience (experience with e-learning), self-regulated learning, and academic achievement of medical students in a blended learning curriculum. Authors have used the e-learning scale (Ginns & Ellis, 2009) and found that the experience with e-learning “affected students’ peer learning and critical thinking and indirectly affected metacognitive regulation”.

When it comes to blended learning, (Ginns & Ellis, 2009) suggest that to evaluate the blended learning quality, one must relate the part of the online learning to the whole of student experience. No matter how a blended learning environment is built, the usefulness, purpose, and value to students and teachers should be a priority.

#### Learner control

Learner control is an important element of the student experience with online and blended learning and is found to have direct benefit on online learning (Taipjutorus, Hansen, & Brown, 2012). Majority of the research looks at control in e-learning, which fits in this research knowing that blended learning has the online or e- component. (Sorgenfrei, Smolnik, Hertlein, & Borschbach, 2013) outline: “E-learning has the ability to provide learners with control of not only how and what they learn, but also of when and where to learn – a perspective that has seldom been conceptualized”. Similarly, (Kay, 2012) outlined key elements of control when using video podcasts as reported by students: students enjoyed control over where and when they learned, what they needed to learn, and the pace of learning. In her doctoral thesis, (Taipjutorus, 2014) looked at learner control through several components: browsing, searching, connecting, collecting, generating (in this order, these represent levels of learner control, from the lowest to the highest level) and found that there is a positive relationship between learner control and online learning self-efficacy; learner control embedded in online learning program positively influenced learner self-efficacy. Also, learner control turned out to be a good predictor of self-efficacy. Furthermore, the relationship between learner control and online learning self-efficacy was stronger for distance learners than for internal learners meaning that distance learners studied with higher levels of learning control.

(Sorgenfrei et al., 2013) have studied learner control and have derived a “conceptual framework as a reference model, based on cognitive and motivational learning theories.” The authors aimed to answer two research questions: “What is the role of learner control regarding the effectiveness of e-learning systems? Which factors determine the effectiveness of learner control in e-learning?” The authors conducted a literature review and have identified two categories of articles related with the research questions: the first one covered the research on “effectiveness of learner control in e-learning by evaluating the relationship of learner control and perceived learner control, learning activities, and learning outcomes” and the second category “extended the capacity of learner control effectiveness and included individual and contextual characteristics as moderators of the learning process”. The study was further presented in a journal article by (Sorgenfrei & Smolnik, 2016), outlining more detailed results, paricularly around positive relations between learner control dimensions and some of the learning processes and outcomes. In this research, the learner control dimensions were derived from e-learning dimensions: control over time and pace, control over location, control over navigation and design, control over interaction, control over content and task selection. Same authors claim that “there is strong evidence that learner control is associated with positive emotional reactions toward a course and the e-learning system, irrespective of the level and dimensions of control provided” (Sorgenfrei & Smolnik, 2016).

(Van Laer & Elen, 2017) studied “attributes of blended learning environments that support learners’ self-regulatory abilities” and have conducted a literature review on 95 articles to source these attributes. The authors found seven attributes, one of which is learner control. 18 articles that covered learning control were studied by the authors; the publications consider learner control as a concept that “describes the degree of control that learners have over the content and activities within the learning environment”. Some of the examples of learner control are control over the pace of the course, the content used, learning activities in which the content is presented and content sequencing which allows the learner to determine the order in which the content is provided.

(Price et al., 2016) explored factors affecting student performance and satisfaction with instructional format across three delivery methods: online, hybrid, and traditional courses. The authors found that higher levels of perceived learner control are associated with higher levels of student satisfaction and performance, across all delivery methods and across all instructors and disciplines. Also, there was no significant difference in the perceived learner control between online, hybrid, and traditional courses.

Finally, (Hung, Chou, Chen, & Own, 2010) developed a scale to evaluate learner control as a part of assessing overall learner readiness for online learning. There are several key findings from this research, including the fact that teachers might need to help students develop self-directed learning and learner-control skills and attitudes, particularly when it comes to online learning context (in which this research was conducted).

# Approaches to learning

In this section, definitions and scope of approaches to learning are covered, including some of the most highlighted perspectives in research to date.

### Definitions and scope

Approaches to learning are one of the key concepts and theories describing learning. Ference Marton and his research team were investigating this concept by asking students to read an academic article and then asking them questions about it. Students were first asked to describe the author’s main message, with responses varying from misunderstanding to a good understanding. After, they were asked how they have gone around the task. The outcomes indicated two approaches to learning, deep and surface approach (Entwistle, 2009, p. 33). The researchers claim that “students who did not get the point failed to do so simply because they were not looking for it” (Entwistle, 2009, p. 33; Marton & Säljö, 1997, p. 43). Other research on approaches to learning include the work of Noel Entwistle (Entwistle & Ramsden, 1983) and John Biggs (Biggs, 1987) whose work has primarily been focused on the student component and their experience and strategies in learning.

The early research on approaches to learning employed various methods, one of which was interview: Noel Entwistle and Paul Ramsden, pioneers in approaches to learning research, have conducted a series of interviews to explore approaches to learning among 57 students. The authors claimed that “a potentially richer and more accurate picture of the links between student learning and its context and content” would be the main reason for working with qualitative approach (Entwistle & Ramsden, 1983, p. 131), while also recognizing the weaknesses of this approach, mainly the danger of bias. The authors examined the relationship between “content and perceived context of the students’ work and their approaches to academic tasks, as well as between approaches and degree results” (Entwistle & Ramsden, 1983, p. 132). For the interviews, the authors have chosen students with extreme scores on the approaches to studying inventory, e.g. students with an expressed strong deep approach to learning. Three groups of questions were developed: the focus of the first group was on reading and essay writing (for arts and social science students) and on problem-solving and report writing (for science students), the second covered assessment strategies and the perceived outcome of the course, and third covered the learning context (teaching, assessment, relationships) (Entwistle & Ramsden, 1983, p. 133). (Entwistle & Ramsden, 1983) developed *Approaches to study inventory (ASI)*, a questionnaire to evaluate approaches to learning.

Based on this and other research, deep and surface approaches were defined.

Overview of deep and surface approach below is taken from (Entwistle, 1997, 2009, p. 36):

**Deep approach to learning** assumes “seeking meaning by:

* Relating ideas to previous knowledge and experience
* Looking for patterns any underlying principles
* Checking evidence and relating it to conclusions
* Examining logic and argument cautiously and critically
* Using rote learning where necessary”

The result is being aware of one’s own understanding and becoming more actively interested in the course content.

**Surface approach to learning** assumes “reproducing by:

* Treating the course as unrelated bits of knowledge
* Routinely memorizing facts or carrying out set procedures
* Studying without reflecting on either purpose or strategy”

The result is finding difficulty in making sense of new ideas, seeing little value or meaning in either the courses or the tasks set, and feeling undue pressure and worry about work.

In interviews conducted by (Entwistle & Ramsden, 1983, p. 137), **deep approach** was categorized by:

* Personal experience: *“integrating task with oneself”,* comparing the task with personal experience, indicating interest to learn, see a task with as a part of one self’s personal development, indicating a wish to “use the knowledge forming part of the task outside its immediate context”.
* Relationships: *“integrating the parts into a whole”*, relating the parts of the task to each other, thinking about relationships between different parts of the material, relating material from different sources, seeing connections between materials that are previously studied and the materials studied now.
* Meaning: *“integrating the whole with its purpose*”, showing intention to establish meaning, thinking about the intention of the whole task, thinking about the underlying structure.

In interviews conducted by (Entwistle & Ramsden, 1983, p. 137), **surface approach** was categorized by:

* Unrelatedness; *“defining the task as separate of its parts”,* express the intention to treat a task as an isolated bit, approaching materials as separate from other ideas and materials, focus on the elements of the task rather than the whole
* Memorisation: *“defining the task as a memory task*”, indicating the intention to memorize the material
* Unreflectiveness: *“defining the task in an external way*”, passive approach to a task, indicate no intention to seek and extract meaning, see the subject matter as external to one self.

The third approach, called **strategic or organized**, was added in years to come, taking into consideration the formal assessment aspect. It was noted that there was a strong impact of assessment on approaches to learning and the strategic (or organized) approach was added to the equation, characterized by the intention to achieve high grades, driven by motivation or responsibility (Entwistle, 2009, p. 38). It is also important to note that some researchers have debated that the term “approach” is actually not appropriate for strategic or organized behavior as organized effort can be applied to either a deep or a surface approach to learning by the same student (Entwistle, 2009, p. 38). For the purpose of this research, three approaches to learning are studied, with implications for further research highlighted at the end of this thesis.

It is important to note that the same student can adopt different approach to learning in different situations/course units/when dealing with a task. The adopted approach depends on a variety of external and internal factors at a given moment.

### Considerations on approaches to learning

Approaches to learning have been well researched by using the original instrument *Approaches to study inventory* (ASI) or using the later developed variations of it, for example *Revised approaches to study inventory (RASI) and Approaches and Study Skills Inventory for Students (ASSIST)* (Entwistle, Tait, & McCune, 2000)*.*

Much research addressed the approaches to learning focusing on influencing factors of the approaches and repercussions the approaches might have on educational practice. For example, it was found that the approach to learning is influenced by motivation, threat, anxiety, where intrinsic motivation, absence of threat, and absence of anxiety are associated with the deep approach, while threat, anxiety, and absence of intrinsic motivation are associated with the surface approach (Fransson, 1977; Marton & Säljö, 1997).

The approaches to learning concept has been a popular research topic globally too. (Valadas, Gonçalves, & Faísca, 2010) have administered a Portuguese version of ASSIST and obtained results consistent with the existing theory on approaches to learning. (Jukić Matić, Matić, & Katalenić, 2013) studied approaches to learning in Croatia with ASSIST; results showed that majority of students in this course unit chose strategic approach, as well as that teaching and course types that support understanding correlated positively to deep and strategic approaches to learning. In Serbia, (Lazarević & Trebješanin, 2013) focused on Biggs’s research and found that deep approach is more represented than the surface one. (Parpala, Lindblom-Ylänne, Komulainen, & Entwistle, 2013) examined the use of a modified Experiences of Teaching and Learning Questionnaire (ETLQ) in the Finnish context; ETLQ appeared to be sufficiently robust and reliable, similar as (Diseth, 2001) who looked at adapting ASSIST for Norway.

Based on the above mentioned research, it is clear that several elements impact the approach to learning.

#### Approaches to learning and teaching-learning environment

Earlier mentioned project “*Enhancing Teaching-Learning Environments in Undergraduate Courses“ (ETL)* was focused on approaches to learning and experience with teaching-learning environment. Several questionnaires were developed during this project: *Learning and Studying Questionnaire (LSQ)* and *Experiences of Teaching and Learning Questionnaire (*ETLQ), and finally *Shortened Experiences of Teaching and Learning Questionnaire (SETLQ)* (ETL Project, Universities of Edinburgh, 2005). These questionnaires, in a more or less detailed way, examine the experience with teaching and learning environment and approaches to learning in a single instrument.

One of the key findings of the earlier mentioned ETL project is that “the students’ perceptions of the teaching and assessment procedures, rather than the methods themselves, that affect student learning most directly (Entwistle et al., 2002)“. Teaching and learning environment has been one of the key perspectives in researching approaches to learning. Earlier, (Trigwell et al., 1999) have developed a questionnaire for evaluating the approaches to teaching and have noticed the relationship between approaches to teaching and approaches to learning: when teachers describe their approach to teaching as teacher-focused, students are more likely to report that they adopt the surface approach. When teachers report adopting the student-focused teaching, students report adopting the deep approach. Some of the common elements of a teaching and learning environment examined in the context of approaches to learning are aims and congruence, teaching for understanding, choice in learning, feedback, assessing understanding, staff enthusiasm and support, student support, and interest and enjoyment (ETL Project, Universities of Edinburgh, 2005).

Indeed, the relationship between the learning environment and approaches to learning has been widely researched. (Fryer & Ginns, 2018) looked at the relationship between students’ perceptions of the learning environment and their approaches to learning. The results supported reciprocal relationships between perceptions of teaching quality and approaches. Authors further conclude that, combined with other findings, diminishing the surface approaches might be a way to improve learning and learning outcomes, rather than seeking to promote deep approaches. (Campbell et al., 2001) conducted a research on approaches to learning and perceptions of their classroom environment and found that students with deep approaches to learning generally demonstrated a more advanced understanding of available learning opportunities and teaching strategies influenced students’ perceptions. When teachers focused on engaging students, students with both approaches to learning focused on student-centered aspects; when teachers focused on traditional explanatory methods, students with both approaches focused on reproducing knowledge.

(Lizzio, Wilson, & Simons, 2002) looked at relationship between approaches to learning and a number of other factors including the teaching-learning environment and concluded that:

* Perceptions of heavy workload and inappropriate assessment impacts students to adopt a more surface approach to study. Perceptions of workload were not systematically related to students’ deep approach.
* Perceptions of a good teaching and learning environment impact students to move towards deep approach, while students’ perceptions of a poor teaching and learning environment influence the surface approach.

The relationship between approaches to learning and examination was also examined by (Karagiannopoulou & Milienos, 2013); it was found that students who score high on deep approach to learning seem to prefer the open-book exam but seem to be unorganized in their study to a similar degree as students who adopt a surface approach to learning.

#### Student characteristics

Under “student characteristics”, year of study, gender, and area of study is looked at in this review.

Several authors have concluded that students move towards adopting a deep approach to learning as they progress through their studies (Asikainen, Parpala, Lindblom-Ylänne, Vanthournout, & Coertjens, 2014; McDonald, Reynolds, Bixley, & Spronken-Smith, 2017; Richardson, 1995; Senemoğlu, 2011). Still, there is research that found that there is no change in approach to learning based on year of study. For example, (Asikainen & Gijbels, 2017) conducted a systematic review on how students’ approaches to learning evolve during higher education, given the assumption in some studies that the approaches develop to a more deep approach throughout higher education. Authors found that “there is no clear empirical evidence for the assumption that students develop towards more deep approaches during higher education”.

(Cebeci, Dane, Kaya, & Yigitoglu, 2013) looked at approaches to learning among different groups of students (law and medicine); authors found that both law and medicine students scored higher on the deep and strategic scores than on surface score, as well as that third year students preferred surface approach more than first and second year students did (not aligned with similar research). Authors claim that surface approach can be undertaken when students might feel overwhelmed by class demands and when they feel like it is the right approach given other inputs. (Senemoğlu, 2011) looked at approach to learning across different disciplines and found a difference in scores on deep approach to learning based on area of study with humanities students scoring higher on deep scale than pre-school and math and science students. (Smith & Miller, 2005) have also studied and acknowledged the difference in approach to learning based on discipline.

(Andreou, Vlachos, & Andreou, 2006) found that there is an effect of gender on strategic approach, where male students perceive themselves as having clear goals related to their studies. (Senemoğlu, 2011) on the other hand found that female students are more inclined to strategic approach. (Lazarević & Trebješanin, 2013) found that female students score higher on deep approach scale, while male students score higher on the surface approach scale. (Cebeci et al., 2013) found no statistically significant difference in approach to learning between male and female students in their research.

# Approaches to learning in a blended learning environment

There has been some research on approaches to learning in a blended learning environment, often including the role of an instructor/teacher and the teaching-learning environment, given the importance of these in the adopted approach to learning.

(Mimirinis & Bhattacharya, 2007) focused on the relationship between approaches to learning and studying, and perceptions of use of a virtual learning environment (VLE). Authors found a correlation between strategic approach and use of the VLE. A weak correlation between deep approach and the willingness to attend other modules that use VLE and a preference towards face to face contact were also established. On the contrary, surface approach was slightly correlated with the idea of having a tutor replaced by a VLE. A few years later, (Mimirinis, 2016) conducted three case studies on students’ approaches to learning in blended learning environments and computed correlations between the overall scores on the three scales of approaches to learning and the usage of LMS functions. Although there were some correlations on individual course level (for example strategic approach moderately correlated with the use of LMS in the Management module), there were no consistent patterns identified. Author suggests that the variability itself is an indicator that approaches to learning in a blended learning experience depend on the level and quality of the face to face and online instruction.

Further, (Jelfs & Colbourn, 2002) studied students’ perception of using ICT for a virtual seminar series, as well as adopted approaches to learning and how this affected their adoption of the electronic medium. Findings include a weak correlation between approaches to learning and perception of ICT. There are also examples of creating specific environments that would support a deeper learning approach. For example, (Gibbs, 2002) studied *coMentor*, a virtual learning environment developed to support debate, discussion, group work and resource sharing among students. Results showed that students who used *coMentor* more than others scored higher on deep and strategic learning scales.

(Karaoğlan Yilmaz, Öztürk, & Yilmaz, 2017) looked at approaches to learning in a structured and flexible-structured flipped classroom model, as well as in a traditional learning environment, and included the analysis of their academic success. Authors found that there was “no significant difference between the academic achievement scores of the students with deep and surface learning approach in structured and flexible-structured environments.”

Networked learning has also been studied in the context of approaches to learning and blended learning. (Goodyear, Asensio, Jones, & Steeples, 2003) looked at relationships between students’ views of the experience with networked learning courses and their conceptions of learning and approaches to study; authors found that there were no strong links between these concepts, indicating that it might be reasonable to expect students might have positive experience with well-done networked learning course, regardless of their conceptions and approaches. (Buckley, Pitt, Norton, & Owens, 2010) looked at the same relationships; this group of authors however found significant positive associations between deep and strategic approaches to study and students’ perceptions of networked learning, and negative associations with a surface approach, suggesting that engaging surface approach students in networked environments can be facilitated by developing insights into the ways they interact online and providing support mechanisms for effective online communication.

Considering the role of a teacher and general learning environment, it is not surprising that some research has been directed in that direction. (Ellis & Bliuc, 2016) worked on developing measures to understand the exchange between student approaches to inquiry (term that encompasses a number of approaches that include problem-based, case-based, project based learning and more) and their approaches to using online learning technologies (includes approaches to learning framework). Authors found that there are “positive and logical associations among the pairs of deep variables, and the pairs of surface variables across both questionnaires”. This is a good step forward to connecting the two concepts, particularly for teachers who need to consider the students’ approaches when developing inquiry based learning within a new learning environment. (González, 2012) developed a questionnaire on approaches to e-teaching to study teachers’ experiences of teaching using e-learning, concluding that the analysis showed it can be used as a preliminary instrument to evaluate the teachers’ approaches, as well as that “student-focused approaches to teaching are needed for significant use of digital technology to emerge“. Earlier mentioned work of (Ginns & Ellis, 2007) was expanded in this area as well, outlining that student focused teaching methods are indeed possible in blended learning and that the key aspects: “quality of online teaching, resources, workload, and student interaction” are related with students’ approaches to study.