



Understanding and interpretation of the terminology of ‘blended learning’ and ‘blended teaching’

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Abstract— The terminology of ‘blended learning’ is widely used, but the content and the definition behind might vary among actors and countries. Thus, it is of highest importance to find a common understanding and interpretation how can we define the term and what key elements can we identify when using it. The paper is aimed at presenting the blended learning in terms of state of the art, at defining the modalities of blended learning with alternation between face-to-face, distance, online, hybrid and flipped learning, paying attention to student’s spatial-temporal environment. Literature review on blended learning was implemented: to collect and to analyze the views and interpretations of the term ‘blended learning’ and characterize them in terms of intended learning outcomes and associated pedagogical approaches.

Keywords—digital learning and teaching, blended learning, terminology

I. Introduction

Formal education traditionally means face-to-face education in classrooms. As the demand for individual, independent learning appeared and then increased, new ways of education were developed.

Distance learning previously viewed with some reluctance, it was merely considered as a solution for the ones who cannot come to the educational facility. Then the COVID pandemic locked down millions of pupils and students, their teachers and their professors. Now that most countries have opened up, one should use the coming period to reflect on how to take benefit of distance learning’s specificities to make it an innovative, beneficial and sustainable way of teaching. The COVID-19 pandemic has a huge impact on education methods worldwide, and which is clear that it cannot be taught as it was before the pandemic. Today there is a huge demand for distance learning, when the teacher and the student are in different space, even at different times. Educational methods need to change and incorporate digital tools into their everyday practice.

As Skulmowski and Günter stated, “as a result of the COVID-19 outbreak, teaching in universities needed to be quickly transitioned from regular on-campus classes into technology-

enhanced teaching formats"[1]. They emphasized that the crisis caused by the pandemic shows the need and urgency of the digitalization in the education generally and in the tertiary education specially. [1]. The mixed method they offer is named "hybrid campus".

What seems to be one of the best solutions is blended learning. This paper proposes to investigate, to present the content and the definition of "blended learning", and to find a common understanding and interpretation.

Computers, mobile devices, networks, really and virtual spaces are increasingly important in the background of blended learning. These interfaces blend into the everyday teaching and learning processes. One of the main goals of Cognitive Infocommunications [2,3,4] is to address the human machine interactions and achieved a lower level of cognitive load. There have been a number of positive results regarding the capabilities of 3D VR for enhancing teaching activities [5-18], the effectiveness of new teaching methodologies [11,12,19] and reducing the cognitive load and digital workflow in 3D VR [10,13]. Our studies aligns with CogInfoCom [2,3,4] principles that focus on the benefit from IT supported cognitive improvements.

Blended learning and teaching combines in-person training with online learning, including distance learning, e-learning and micro-learning to benefit from the advantages of each of these methods. The investigation is based on literature review, collecting and analyzing the views and interpretations of the term 'blended learning', comparing with traditional, online, and flipped classes.

The paper is structured as follows. In the second chapter, the term "blended learning" is interpreted. In the third chapter online, distance, flipped and hybrid learning will be compared with blended learning.

The paper concludes that the digitalization of university teaching has greatly accelerated and a hybrid campus can be conceivable in the future.

1. Blended Learning

The term blended learning is commonplace in educational practice, but is often used synonymously with the concepts of online learning and digital learning. The common use of world wide web in the education transformed both the teaching and learning method. Among the several type of teaching methods, the blended learning became one of the commonly used. In this program, student's spatial-temporal environment is the same as their teachers'. Any variation of internet from the student or from the teacher side belongs to the blended learning. This assumes that all the teachers and students have the right tools and they can also use them. The flipped learning method is similar in that, but the students' spatial-temporal environment is not the same as their teachers'. Students prepare for lessons at home using the internet [20].

From its first occurrence in 1999, great number of blended learning frameworks and models have emerged. Report on defining blended learning written by Norm Friesen gives an overview and summary of the meaning of "blended learning" which has changed overtime. He suggested a composite definition: "Blended learning designates the range of possibilities presented by combining Internet and digital media with established classroom forms that require the physical co-presence of teacher and students" [21].

The blended method combines the best elements of online and face-to-face learning. This seems to be one of the best ways to combining both face-to-face and online learning materials, and the teachers and students are in the same spatial-temporal environment.

That is, online education is not the same as distance learning as many interpret it, namely online learning materials are also used for attendance education.

Blended learning means many things to many people. Blended/hybrid learning, in general terms, combines online delivery of educational content with classroom interaction and live instruction. The aim of this mixed method is to make the education personalized and flexible [22]. Several researchers interpret that "blended learning" is a combination of online and face-

to-face teaching or a combination of face-to-face instruction and computer-mediated instruction [23, 24].

The results regarding the effectiveness of these forms of education could not prove and underpin clearly the highest effectiveness neither the face-to-face/traditional education nor blended/flipped classrooms. The combination of these methods are the best [25].

Examining the topic, Youping focused on the following five fundamental attributes: complexity, self-organization, adaptability, dynamism, and the ability to co-evolve. According to her, the blended learning is an adaptive, dynamic, self-organizing, co-evolving complex system that seamlessly fuses face-to-face with technology-mediated learning. [26,27].

Although there is a difference of interpretations, it is clearly seen that (a) blended learning/teaching combines in-person training with online learning to benefit from the advantages of each of these methods, and (b) the benefits of blended learning are numerous. Highlighting the most significant:

- Personalization: by adding self-training and virtual classes to in-class teaching, blended learning is training delivered at right amounts, at right moments. Training can now fit in a pocket and is becoming more and more convenient for us to travel. The training can therefore be consulted anywhere and at any time;
- It favours memory anchoring. By allowing shorter learning sessions distributed over time, it is much more effective than concentrated sessions;
- It promotes back-and-forth moves between knowledge acquisition and practical application during virtual class interclasses;
- It facilitates quality assessment: blended learning learners no longer simply acquire knowledge, but develops skills, making it easier to assess the rise in the skill level;
- It suits digital natives and is adapted to increasingly technology-oriented learning methods;
- Social learning is encouraged, and a micro-community can be created around the training.

2. Online, Distance, Flipped and Hybrid Learning

There are a number of terms that are often used as synonyms of blended learning. In this chapter, we list and interpret some typical ones.

E-learning often regarded as “distance learning”, although we also can use Internet-based teaching and learning materials in attendance education, as well.

Originally, the first distance education course was provided in the 19th century, where distance education, also called distance learning means the education of students who may not be physically present at a school. [28]. In the modern sense, a distance learning can be completely distance learning, or a combination of distance learning and traditional classroom instruction [29].

Scholars see flipped learning as a form of blended learning. It is said that flipped classroom is a type of blended learning, an instructional strategy aiming to increase student engagement, when students work a lot in their home, for preparing the lessons and in the classroom for discussing the different problem solving or way of thinking in the classroom. In the “Blended learning vs flipped classroom – What’s the difference?” article the author concludes that a blended learning provides a more effective learning experience for the students, because of the rich online available contents. In this case, both the teacher and students are in the same time in the same place. Unlike in a flipped classroom, when the content is viewed online at home by the students, preparing them for lessons [30].

Surfing on the internet, many of papers can be found positively evaluating flipped education. Quoted the key words from the titles of some below: improvements, fruits of active learning, improve student performance and satisfaction, enhance engagement and promote active learning, the answer to future abstract learning, active, effective and increased learning

It was a great pressure on higher education to adapt to the demand of students 'which means more flexible, effective, active, and student-centered teaching method [31].

According to some authors, blended learning and hybrid learning are similar but not same methods. The difference came from the fact that blended learning is a mix of distance and traditional learning methods, however hybrid learning combines any of online or offline methods [32]. "Hybrid learning is a hybrid approach that builds on the successes of flipped, blended, distance and online learning to intentionally create learner-centered experiences that are profoundly personalized, relevant and engaging" [33].

3. Digital Future

The COVID-19 situation has greatly affected the teaching and learning methods forcing the educational institutions at all level to turn to the digitalization. There is also a great demand for flexibility and autonomy for students as well as educators [1].

Any of the practices, including blended/hybrid learning, online learning, flipped, distance learning can be considered as digital in its nature applying world wide web technology and contents for learning. Even, the virtual reality, augmented reality, mixed reality are mentioned as learning strategy of the future [34]. Today, we can see many positive experiences in the field of VR and AR education [8-12]. The Difference between Virtual Reality, Augmented Reality and Mixed Reality is as follows: Virtual reality (VR) immerses users in a fully artificial digital environment (User needs to wear a special VR headset to experience virtual reality). Augmented reality (AR) overlays virtual objects on the real-world environment (In augmented reality, users see and interact with the real world while digital content is added to it). Mixed reality (MR) not just overlays but anchors virtual objects to the real world (It has two types: Mixed reality that starts with the real world vs. Mixed reality that starts with the virtual world) [35].

Conclusion

The paper presented the interpretations of blended learning, and defined its modalities with alternation between face-to-face, distance, online, hybrid and flipped learning, aiming to find a common understanding and interpretation how can we define the term when using it. By reviewing and interpreting the philosophical and theoretical background, the article connects to CogInfoCom research fields and establishes the extending of blended learning to VR, AR, and Mixed reality-based education as well.

References

- [1] Skulmowski A., and Rey G.D., "COVID-19 as an accelerator for digitalization at a German university: Establishing hybrid campuses in times of crisis". *Human Behavior and Emerging Technologies*. 2020, 2(3): pp. 212–216. doi:10.1002/hbe2.201. PMC 7283701. PMID 32838228.
- [2] P. Baranyi, A. Csapo, Gy. Sallai, "Cognitive Infocommunications (CogInfoCom) ", Springer International Publishing Switzerland, p.191.
- [3] P. Baranyi and A. Csapo, "Definition and Synergies of Cognitive Infocommunications", *Acta Polytechnica Hungarica*, vol. 9, pp. 6783, 2012. (978-3-319-19607-7, <http://www.springer.com/us/book/9783319196077#aboutBook>.
- [4] Á. Csapó, P. Baranyi, P. Várlaki, "A Taxonomy of CogInfoCom Trigger Types in Practical Use Cases", in 3th IEEE International Conference on Cognitive Infocommunications (CogInfoCom). IEEE, 2012, pp.21-25.
- [5] Á. Csapo, I. Horváth, P. Galambos, P. Baranyi VR as a Medium of Communication: from Memory Palaces to Comprehensive Memory Management In Cognitive Infocommunications (CogInfoCom), 2018 9th IEEE International Conference, Budapest
- [6] B. Berki, "Better Memory Performance for Images in MaxWhere 3D VR Space than in Website", 9th IEEE International Conference on Cognitive Infocommunications (CogInfoCom), pp. 000281-000284, 2018.
- [7] B. Berki, "2D Advertising in 3D Virtual Spaces", *Acta Polytechnica Hungarica*, pp. 175-190. Vol.15, No.3. 2018

- [8] F. Bellalouna, "Case Study for an Operation-based Topology Optimization Using the Digital Twin Approach", 28th CIRP Conference on Life Cycle Engineering, ScienceDirect, 2021.
- [9] F. Bellalouna, "Industrial Use Cases for Augmented Reality Application", 11th IEEE International Conference on Cognitive Infocommunications, pp.11-18. 2020
- [10] I. Horváth, Anna Sudár, "Factors Contributing to the Enhanced Performance of the MaxWhere 3D VR Platform in the Distribution of Digital Information", Acta Polytechnica Hungarica, pp. 149-173. Vol. 15, No. 3, 2018
- [11] I. Horváth: "Personalized Learning Opportunities in 3D VR", 11th IEEE International Conference on Cognitive Infocommunications
- [12] Gy. Molnár, Z. Szűts, K. Biró, "Use of Augmented Reality in Learning," Acta Polytechnica Hungarica, vol. 15, no. 5, pp. 209-222, 2018.
- [13] I. Horváth, "MaxWhere 3D capabilities contributing to the Enhanced Performance of Trello 2D software", Acta Polytechnica Hungarica Volume 16, Issue Number 6. pp. 55-71. 2019.
- [14] M. Konczosné Szombathelyi; P. Waldbuesser; R. Tench. "Digital age: Information and communication technologies, tools and trends for communication management". 6th IEEE Conference on Cognitive Infocommunications CogInfoCom 2015 Proceedings; pp. 229-234. ISBN: 978-1-4673-8128-4; Coginfo conference 2015. October 19-20-21. Győr, <https://ieeexplore.ieee.org/document/7390596>
- [15] M. Konczosné Szombathelyi; Sz. Rámháp; E. Májer, "Special coginfo application by non-business organizations (Case study on marketing communication of a higher education institution)." 6th IEEE Conference on Cognitive Infocommunications CogInfoCom 2015 Proceedings; pp. 483-488. Coginfo conference 2015. October 19-20-21. Győr; ISBN: 978-1-4673-8128-4
- [16] Z. Kvasznicza, G. Maza, J. Kovács, B. Péli, "VR based Duale education at E.ON - The win-win-win situation for companies, graduates and universities", 10th IEEE International Conference on Cognitive Infocommunications, Naples, Italy, 2019
- [17] Vicsi, K., Roach, P., Oster, A., Kacic, Z., Barczikay, P.,Tantos, A., et al. "A multimedia multilingual teaching and training system for children with speech disorders", International Journal of speech technology 3, 289-300, 2000.
- [18] C. Vogel, and A. Esposito., "Interaction analysis and cognitive infocommunications", Infocommunications Journal 12, 2-9, 2020.
- [19] A. Kővári, "Adult education 4.0 and Industry 4.0 challenges in lifelong learning," PEDACTA, vol. 9, no. 1, pp. 9-16, 2019
- [20] Rosell, C. D., Introducing Blended Learning into a Traditional Classroom <https://www.cae.net/how-to-introduce-blended-learning-to-a-traditional-classroom/>
- [21] Friesen, N., Report on defining blended learning https://www.normfriesen.info/papers/Defining_Blended_Learning_NF.pdf, 2012
- [22] Watson, J., Blending Learning: The Convergence of Online and Face-to-Face Education, <https://files.eric.ed.gov/fulltext/ED509636.pdf>, 2008
- [23] Wong, L., Tatnall, A. and Burgess, S., "A framework for investigating blended learning effectiveness", Education + Training, 2014, Vol. 56 No. 2/3, pp. 233-251. <https://doi.org/10.1108/ET-04-2013-0049>
- [24] Suwarna, Rani and Balakrishnan Muniandy, "The Effect of Flipped Classroom on Students' Engagement", Technology, Knowledge and Learning, 2019, 24(6), pp. 355-372, DOI: 10.1007/s10758-017-9343-y
- [25] Jacot, M. T., Noren, J., Berge, Z. L., The Flipped Classroom in Training and Development: Fad or the Future? Performance Improvement, 2014, 53(9), pp. 23-28., <https://doi.org/10.1002/pfi.21438>
- [26] Yuping, W., X. Han, Yang, J., Revisiting the Blended Learning Literature: Using a Complex Adaptive Systems Framework. Educational Technology & Society, 2015, 18(2):380-393
- [27] Bruff, D. O., Fisher, D. H., McEwen, K. E., and Smith, B. E., "Wrapping a MOOC: Student perceptions of an experiment in blended learning". Journal of Online Learning and Teaching, 2013, 9(2), 187-199.
- [28] Kaplan, A. M., and Haenlein, M., "Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster". Business Horizons. 2016, 59 (4): pp. 441-50. doi:10.1016/j.bushor.2016.03.008.
- [29] Vaughan, N. D. "Blended Learning". In Cleveland-Innes, MF; Garrison, (eds.). An Introduction to Distance Education: Understanding Teaching and Learning in a New Era. Taylor & Francis. p. 165. ISBN 978-0-415-99598-6. Retrieved 23 January 2011.
- [30] "Blended learning vs flipped classroom – What's the difference?" <https://www.moovly.com/blog/blended-learning-vs-flipped-classroom-whats-the->
- [31] Nouri, J., "The flipped classroom: for active, effective and increased learning – especially for low achievers". International Journal of Educational Technology in Higher Education, 2016, 13(33), <https://doi.org/10.1186/s41239-016-0032-z>
- [32] Reed, M., A Guide to Hybrid and Blended Learning in Higher Education, October 8, 2020, <https://www.wwt.com/article/guide-to-hybrid-blended-learning-higher-ed>

- [33] Understanding the Difference between Hybrid Education and Blended Learning
<https://www.schoolology.com/blog/understanding-difference-between-hybrid-education-and-blended-learning>
- [34] The Difference between Virtual Reality, Augmented Reality and Mixed Reality
<https://www.forbes.com/sites/quora/2018/02/02/the-difference-between-virtual-reality-augmented-reality-and-mixed-reality/?sh=640ac6992d07>
- [35] Gleb, B., VR vs AR vs MR: Differences and Real-Life Applications, Jan 04, 2020
<https://rubygarage.org/blog/difference-between-ar-vr-mr>