

BLENDING LEARNING TECHNOLOGIES FOR A FOREIGN LANGUAGE TEACHING THE STUDENTS OF NON-PHILOLOGICAL MAJORS

Zelenskyi M.^a, Nesterenko I.^a, Volovik N.^a, Mytsenko D.^{a1}

^aKiev Institute of Business and Technology, Ukraine

Abstract

Modern theories of foreign language teaching are getting developed. The constant society digitalization influences it. Generation Z students closely associate their lives with technology. Moreover, teachers must find ways to apply effectively information and communication technologies in the learning process. In our opinion, one of the ways is the concept of blended learning. It implies the optimal combination of traditional pedagogical technologies and distance, online learning. The purpose of our research is to examine the effectiveness of the concept of blended learning in the process of learning a foreign language for students of non-philological majors. For this purpose, we conducted a pedagogical experiment. It assumes the introduction of the concept of blended learning in the educational process of higher education. The research was carried out with Ukrainian students of non-philological majors during the study of English (offline and online). Also, international students who are studying Ukrainian as a foreign language were involved. Comparative analysis of students' readiness to learn using different blended learning tools was used. Methods of mathematical statistics (nonparametric Kruskal-Wallis and Mann-Whitney criteria) were utilized to analyse and process the experimental data. The results of the study indicate the effectiveness of blended learning technology usage in the process of foreign language teaching. Nevertheless, they show that the proposed tools help students better master a foreign language. Besides, students are both in active learning and passively reinforcing their knowledge using digital technologies during education. The authors consider it indisputable that blended learning tools should be used to some extent for students of all majors. The authors understand that the proposed tools are not exhaustive and definitive. Their list should be extended, and the use of specific tools depends on the teacher, students, the course, and other factors.

Keywords: learning management system; computer-supported collaborative learning; computers and learning; pedagogical experiment.

ТЕХНОЛОГІЇ ЗМІШАНОГО НАВЧАННЯ ДЛЯ ВИКЛАДАННЯ ІНОЗЕМНОЇ МОВИ СТУДЕНТАМ НЕ ФІЛОЛОГІЧНИХ СПЕЦІАЛЬНОСТЕЙ

Зеленський М.^a, Нестеренко І.^a, Воловик Н.^a, Миценко Д.^{a1}

^aКиївський інститут бізнесу та технологій

Анотація

Сучасні теорії викладання цілому та окремо у сфері мовної підготовки отримують новий поштовх для розвитку. Цей поштовх дає постійна діджиталізація суспільства. Учні покоління «Z» тісно пов'язують своє життя з технологіями. І викладачі мають знайти шляхи ефективного застосування інформаційно-комунікаційних технологій у процесі навчання. Одним з таких шляхів є, на нашу думку, концепція змішаного навчання (blended learning), згідно з якою традиційні педагогічні технології оптимально поєднуються з дистанційним, онлайн-навчанням. Метою нашого дослідження є перевірка ефективності застосування концепції змішаного навчання в процесі вивчення іноземної мови студентам нефілологічних спеціальностей. Для цього обрано такий метод дослідження як педагогічний експеримент з впровадження концепції змішаного навчання в навчальний процес закладу вищої освіти. Проведена робота з українськими студентами нефілологічних спеціальностей під час навчання англійської мови в аудиторії та зі студентами з інших країн під час вивчення ними української мови як іноземної. Ці дві групи студентів дозволили провести компаративний аналіз готовності студентів навчатися за допомогою різних інструментів змішаного навчання. З метою аналізу та обробки експериментальних даних використані методи математичної статистики (непараметричні критерії Крускала-Уолліса та Манна-Уїтні). Результати дослідження свідчать про ефективність застосування технології змішаного навчання в процесі вивчення іноземної мови. Та показують, що запропоновані інструменти введені у процес навчання іноземної мови допомагають студентам краще її опанувати. Окрім цього студенти знаходяться як у активному навчанні так і пасивно підкріплюють свої знання користуючись цифровими технологіями під час навчання. Автори вважають беззаперечним той факт, що інструменти змішаного навчання в тій чи іншій мірі мають застосовуватися для студентів всіх напрямів підготовки. Автори розуміють, що запропоновані інструменти не є вичерпними та остаточними. Їх перелік має бути продовжений та використання тих чи інших інструментів залежить від викладача, студентів, дисципліни, що викладається та інших чинників.

Ключові слова: система управління навчанням; навчання за допомогою комп'ютерних технологій; комп'ютери та навчання, педагогічний експеримент.

¹ Corresponding author.

E-mail address: d.mytsenko@kibit.edu.ua

Introduction

The digitalization of society has led to the emergence of new challenges for language teachers. The newest technologies that surround Generation Z are stimulating the emergence of new requirements for foreign language classes. Teachers are continually implementing the latest technologies into the classes. The way based on modern technologies to modernize the educational process is blended learning (Allen, 2007; Smith & Hill, 2019; Hrastinski, 2019). According to which traditional pedagogical technologies are optimally combined with distance and online learning.

The definition of «blended learning» is given by K. J. Bonk and C. R. Graham. «Blended learning» is a learning system that combines traditional face-to-face learning with computer-mediated technology (Bonk and Graham, 2006).

Teachers and scientists around the world research this topic (Moskal et al., 2013; DeBoer et al., 2014; Paulsen & McCormick, 2020). Huge study says the computer technology usage helps students in learning (Tamim et al. 2011), computer-supported collaborative learning were analysed by Chen et al. (2018),

Our interest is in the peculiarities of applying the blended learning technologies in the process of foreign language teaching (Fomyna, 2014; Aynutdinova, 2015; Chilingaryan and Zvereva, 2017).

The modern vector of Ukraine's development determines a progressive transition from traditional teaching methods focused on the passive audience to more technological ones focused on the active audience (Vogler et al., 2019; Zydney et al., 2019; Money & Dean, 2019). At the forefront is the formation of students' soft skills and the introduction of computer and digital literacy.

Applying information technology in foreign language teaching methodology dates back to the 80s of the last century. Ray Clifford, director of the Brigham Young University Institute for the Humanities and the Center for Linguistic Research, notes that technology will never replace a teacher. However, teachers who do not use technology will be replaced (Healey et al. 2008). Teachers of Ukrainian educational institutions use information and communication technologies to help students master the material much faster for more than 20 years (Kukhareno, 2016).

Our study aims to test the effectiveness of blended learning technologies in the process of foreign language teaching for students of non-philological majors.

We understand information and communication technologies (ICT) as a set of software, hardware, communication tools, and ways of their application to ensure high efficiency and informatization of the educational process (Facer, 2013; Ruliene, 2017; Asarta & Schmidt, 2020). ICTs are particularly

useful in working with students who belong to Generation Z. Those are born from late 1990 to 2010 in the era of digital progress (Popov, 2018; Rospigliosi, 2019) («Digital natives» or «Gen Z»). They, digital natives, cannot feel comfortable without the Internet and gadgets. Hence, the use of information and communication technologies positively affects the educational process (Helm et al., 2020).

The active usage of information and communication technologies in education is indeed one of the essential steps in transforming a higher education institution into a University 3.0 (Kushnir et al., 2019).

The development of ICT facilitates the determination of channels of learners' information perception (Morris et al., 2019). A student-centered approach claims to choose the right (verbal, audio, kinesthetic, visual) channels of information flow (Kyreev, 2018; Romadhon et al., 2019; Brook & Pedler, 2020). The use of ICT helps better information assimilation by students. In our opinion, a language teacher of the XXI century should be an innovator in his teaching style and operate with educational ICT.

Analysis of pedagogical research allows us to conclude that one of the most influential and well-known educational approaches to ICT use is blended learning (Mitsenko, 2019). Traditional learning technologies are combined with distance, e-learning and mobile learning to harmoniously combine the theoretical and practical components of the learning process (Boelens et al., 2018; MacLeod et al., 2018; Singh & Miah, 2020).

Blended learning technologies are especially useful in foreign language teaching, as it provides the opportunity for live communication, online communication, reading, watching videos, and more (Hubackova et al., 2011; Lee et al., 2017; Nalimova & Valeev, 2019).

To date, there are several dozen models (options) for the implementation of blended learning technology. They differ in accents, purpose, goals, costs, and others. Simultaneously, the classification of the American researcher MB Horn is generally accepted, which identifies six models of blended learning (Horn, Staker, 2011).

- Face-to-Face Driver (Driver – Full-time education). The teacher personally teaches the main amount of educational material in the classroom. The required amount of online training is added to the classroom course, which is thus additional and complements the traditional one.
- Rotation model. There is a rotation of classroom classes and independent work of students online.
- Flex model. The training course is mainly conducted online. The teacher coordinates the activities of students through the network. «Live» contacts occur as needed.

- Online Lab. The course is taught online in an equipped classroom under the guidance of a teacher.
- Self-Blend Model. Students independently choose training courses to study online.
- Online Driver Model (Driver – Online education). Learning takes place online through an educational platform. Contacts with the teacher are also carried out in the mode of remote access, face-to-face classes and meetings are not provided, but can be added as needed.

The teacher's work in the blended learning model begins with creating a course and structuring it. It is necessary to determine the material for classwork and distance learning.

1) The materials for distance learning are posted on the chosen online platform. These materials include practical work, recommended references, projects for group work. The teacher sets checkups and self-control tasks.

2) Webinars, individual, and group online consultations should be used for online learning. The teacher here advises, coordinates, and directs student's cognitive activity and motivation (Vanslambrouck et al., 2017). Online learning activities involve the simultaneous (at one time) work of students with the teacher. Note that there are options for implementing a blended learning model that does not include an online learning unit. The main difference from the distance learning is synchronization between student and teacher.

3) The traditional «face-to-face» learning includes discussions, debates, interviews, and defending students' projects. This model is the most dialogical / polylogical communication.

The teacher evaluates a student's work in three blocks of the course. It is true that, depending on the specifics of the course, the teacher can evaluate a particular block of the course higher.

To identify the best ways to implement blended learning technologies in the process of foreign language teaching, to identify pros and cons, we conducted a pedagogical experiment. Its relevance is due to the need to establish the most effective means of blended learning a foreign language teaching.

Methods and Materials

The experiment was carried out during the 2019-2020 first semester, based on the Kyiv Institute of Business and Technology and the College of Economics and Technology. The experimental study included three experimental (EG) and three control groups (CG). A total of 87 students of control and experimental groups and three teachers participated in the pedagogical experiment.

Kyiv Institute of Business and Technology provides education using the Google Classroom – a free online educational platform. In the

university, we use Google Classroom as a Learning Management System (LMS) since 2016. So we continued to use Google Classroom for both and CG and EG.

At the first stage of the experiment, we selected the three experimental groups (EG) and three control groups (CG), around 15 students in each. We had the grades for the previous semester for this class, and we took the percentage of the number of students for every grade as an initial point (Table 1).

Every teacher had two groups – one experimental and one control. Each teacher decided what models and technologies to use in the EG. All of their courses included the same learning sections – Listening, Reading, Speaking, and Writing. Furthermore, each pair of CG and EG had the same level of language they were studying.

The experiment started in September 2019 and was carried out until the end of the first semester. We wanted to proceed until the end of the second semester, but the COVID-19 pandemic stopped us. We had to change all the learning process from offline to only online.

We used the nonparametric Kruskal-Wallis and Mann-Whitney U-test to identify the difference in academic performance of the EG and CG on the initial level. The computer program SPSS Statistics 22 was used for calculations.

Teachers who took part in the pedagogical experiment used several blended learning models depending on the didactic purpose in foreign language teaching in the EG. Using the capabilities of Google Classroom, teachers developed their courses, created tasks of various types, added the necessary links, manuals, tutorial videos, diagrams, and more. Teachers invited students to take the course, set deadlines for tasks, check their performance, and evaluate. We emphasize that according to the variant of blended learning «Face-to-Face Driver», the tasks placed in Google Classroom were a supplement to the classroom work.

Such a variant of «rotation model» as «Flipped Classroom» was widely used in EG's educational process. According to Gelgoot et al. (2020) flipped classrooms are more important to motivate students then to increase their academic achievements. According to this approach, what in traditional education usually relies on students' classroom work (acquaintance with new material) was performed independently. Consolidation of self-studied material took place in the classroom, with the teacher's support and interaction with classmates. Students' classroom work during practical classes (traditional learning unit) complements their independent work using the educational platform Google Classroom (distance education unit).

The educational process in the CG was carried out within the traditional organizational forms and methods of foreign language teaching during

classroom and independent work in the Google Classroom.

Results

Evaluation of students' academic achievements at the end of the main stage of the experiment confirmed our hypothesis about the effectiveness of the use of blended learning technology in the process of learning a foreign language (see Table 1, Fig. 1-4).

Discussion and Conclusion

Based on the calculations, the difference in academic achievements in a foreign language of EG and CG is not statistically significant ($p \leq 0.05$) at the beginning of the experiment.

During the main stage of the experiment, we implemented blended learning technologies into EG' educational process. We had a traditional educational process in CG. We measured the level of academic achievement at the end of the experiment. Based on the application of nonparametric criteria of Kruskal-Wallis and Mann-Whitney U-test in the analysis of the experiment results, we saw the level of academic achievement in EGs (by «listening»,

«reading» and «writing») was higher than in the CG. The difference in the academic achievements of CG and EG is statistically significant ($p \leq 0.05$) (see Table 1, Fig. 1, 2, 4). Simultaneously, it was found that the «speaking» section shows no statistically significant difference in the educational achievements of CG and EG (see Table 1, Fig. 3). Finally, the identification of differences in the academic achievements of EG and CG proves its statistical significance.

The results of the experiment show that blended learning is appropriate and effective in foreign language teaching. Also, in the «speaking» section, blended learning showed the same effectiveness as traditional methods. In our opinion, this is due to the specific features of the communication process itself. We consider it appropriate to supplement blended learning with various communication forms in a foreign language through online services and social media (Crilly & Kayyali, 2019; Lopez-Carril et al., 2020; Manca, 2020). We use Google Hangouts primarily, as it is already integrated with the Google Classroom platform. Furthermore,

Table 1

| Learning sections | Groups | Students' academic achievements in percentage | | | | | | | |
|-------------------|--------|---|-------|----------|-------|----------|-------|---------------|-------|
| | | Satisfactory (D) | | Good (C) | | Good (B) | | Excellent (A) | |
| | | initial | final | initial | final | initial | final | initial | final |
| Listening | EG | 34 | 22 | 39 | 27 | 22 | 39 | 5 | 12 |
| | CG | 32,5 | 26 | 39 | 35 | 22 | 28 | 6,5 | 11 |
| Reading | EG | 27 | 17 | 46 | 34 | 20 | 34 | 7 | 15 |
| | CG | 24 | 19,5 | 41 | 35 | 26 | 32,5 | 9 | 13 |
| Speaking | EG | 29 | 24 | 42 | 29 | 22 | 32 | 7 | 15 |
| | CG | 28 | 22 | 37,5 | 26 | 28 | 39 | 6,5 | 13 |
| Writing | EG | 29 | 20 | 42 | 29 | 24 | 39 | 5 | 12 |
| | CG | 30,5 | 24 | 41 | 32,5 | 22 | 32,5 | 6,5 | 11 |

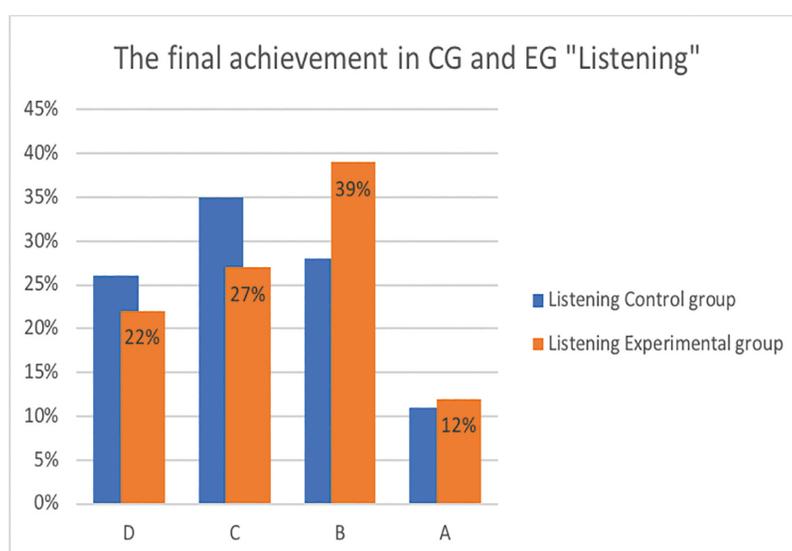


Fig. 1. The final achievement in CG and EG "Listening"

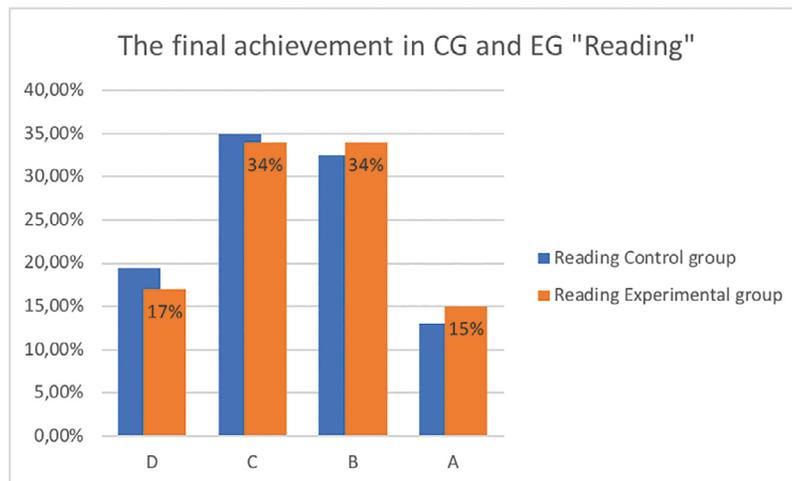


Fig. 2. The final achievement in CG and EG «Reading»

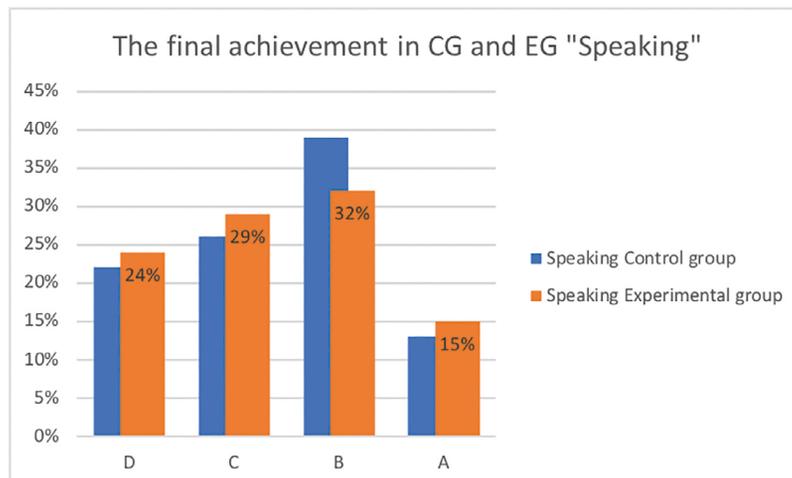


Fig. 3. The final achievement in CG and EG «Speaking»

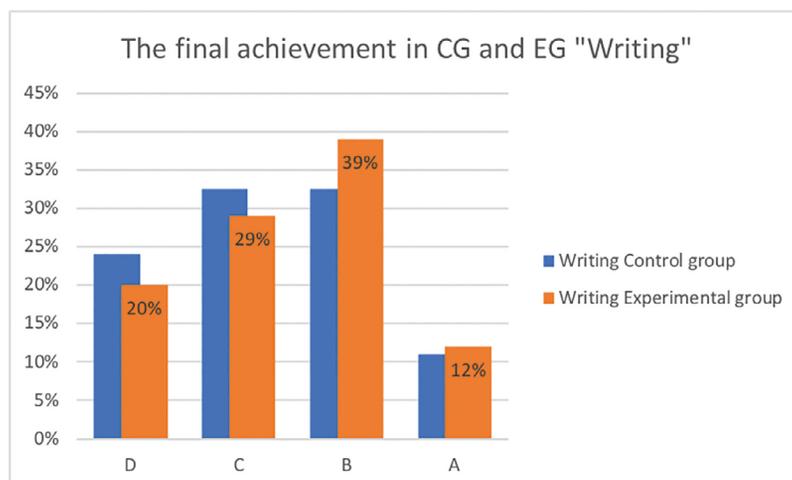


Fig. 4. The final achievement in CG and EG «Writing»

standard services such as Skype, Zoom, and others can be used.

However, ICTs have certain shortcomings that can cause difficulties in their implementation into the education. First, both the teacher and the student must be able to use ICT. Second, online learning does not provide an immediate teacher response.

On the one hand, we need to continue to apply blended learning technologies to perform educational tasks and sets of exercises to acquire speech competence and learn the rules and regulations of communication in a foreign language environment. On the other hand, the ultimate goal of applying blended learning to teaching is to form competitive, creative, and talented individuals who can respond efficiently to modern society's challenges.

The article focuses on the need for the application of blended learning. It considers some educational technologies that can be implemented in the pedagogical activities of language teachers. Based on the results of experimental research, the authors concluded the effectiveness and feasibility of using blended learning technology in foreign language teaching.

REFERENCES

1. Allen I. (2007) Blending in: The Extent and Promise of Blended Education in the United States. <https://www.onlinelearningsurvey.com/reports/blending-in.pdf>
2. Asarta, C. J., & Schmidt, J. R. (2020). The effects of online and blended experience on outcomes in a blended learning environment. *The Internet and Higher Education*, 44, 100708. <https://doi.org/10.1016/j.iheduc.2019.100708>
3. Aynutdinova I.N. (2015). Topical issues of using blended learning technology in teaching foreign languages at a university. *Society: sociology, psychology, pedagogy*, (6), 74-77. (In Russian)
4. Boelens, R., Voet, M., & De Wever, B. (2018). The design of blended learning in response to student diversity in higher education: Instructors' views and use of differentiated instruction in blended learning. *Computers & Education*, 120, 197-212. <https://doi.org/10.1016/j.compedu.2018.02.009>
5. Bonk C. J., Graham Ch. R. (2006) *The Handbook of Blended Learning: Global Perspectives, Local Designs* / foreword by M.G. Moore, J. Cross. John Wiley & Sons Ltd. 624 p.
6. Brook, C., & Pedler, M. (2020). Action learning in academic management education: A state of the field review. *The International Journal of Management Education*, 18(3), 100415. <https://doi.org/10.1016/j.ijme.2020.100415>
7. Chen, J., Wang, M., Kirschner, P. A., & Tsai, C.-C. (2018). The Role of Collaboration, Computer Use, Learning Environments, and Supporting Strategies in CSCL: A Meta-Analysis. *Review of Educational Research*, 003465431879158. <https://doi.org/10.3102/0034654318791584>
8. Chilingaryan, K., & Zvereva, E. (2017). Methodology of Flipped Classroom as a Learning Technology in Foreign Language Teaching. *Procedia – Social and Behavioral Sciences*, 237, 1500–1504. <https://doi.org/10.1016/j.sbspro.2017.02.236>
9. Crilly, P., & Kayyali, R. (2019). The use of social media as a tool to educate United Kingdom undergraduate pharmacy students about public health. *Currents in Pharmacy Teaching and Learning*. <https://doi.org/10.1016/j.cptl.2019.11.012>
10. DeBoer, J., Ho, A. D., Stump, G. S., & Breslow, L. (2014). Changing “Course.” *Educational Researcher*, 43(2), 74–84. <https://doi.org/10.3102/0013189x14523038>
11. Facer, K. (2013). The problem of the future and the possibilities of the present in education research. *International Journal of Educational Research*, 61, 135–143. <https://doi.org/10.1016/j.ijer.2013.03.001>
12. Fomyna A. S. (2014) Blended learning at a university: institutional, organizational, technological and pedagogical aspects. *Theory and practice of social development*. №21. 272–279.
13. Gelgoot, E. S., Bulakowski, P. F., & Worrell, F. C. (2020). Flipping a Classroom for Academically Talented Students. *Journal of Advanced Academics*, 1932202X2091935. <https://doi.org/10.1177/1932202x20919357>
14. Healey, D., Hegelheimer, V., Hubbard, P., Iannou-Georgiou, S., Kessler, G. and Ware, P. (2008) *TESOL Technology Standards Framework*, Alexandria, VA: TESOL Publications.
15. Helm, F., Arens, A. K., & Möller, J. (2020). Perceived teacher unfairness and student motivation in math and German: An application of the generalized internal/external frame of reference model. *Learning and Individual Differences*, 81, 101891. <https://doi.org/10.1016/j.lindif.2020.101891>
16. Horn M. B., Staker H. (2011) *The Rise of K-12 Blended Learning*. Innosight Institute – Charter School Growth Fund – Public Impact, 2011. 17 p.
17. Hrastinski, S. (2019) What Do We Mean by Blended Learning? *TechTrends* 63, 564–569. <https://doi.org/10.1007/s11528-019-00375-5>
18. Hubackova, S., Semradova, I., & Klimova, B. F. (2011). Blended Learning in A Foreign Language Teaching. *Procedia – Social and Behavioral Sciences*, 28, 281–285. <https://doi.org/10.1016/j.sbspro.2011.11.054>
19. Kukharenko V. M. (2016) *Theory and practice of blended learning: Monograph* Kharkiv: Miskdruk, NTU «KhPI». 284 p. (In Ukrainian)
20. Kushnir O., Pilipenko V., Yakovleva O. (2019) *The Formation of Students Motivation: Problem or Opportunity*. Herald of Kiev Institute of Business and Technology. 3 (42). 5-10 <https://doi.org/10.37203/kibit.2019.42.01>
21. Kyreev B.N. (2018) An overview on some results of the experiment on the use of blended learning in higher education institution. *Teacher in XXI century*. V. 3-1. 48-60 (In Russian)
22. Lee, C., Yeung, A. S., & Ip, T. (2017). University English language learners' readiness to use computer technology for self-directed learning. *System*, 67, 99–110. <https://doi.org/10.1016/j.system.2017.05.001>
23. Lopez-Carril S., Anagnostopoulos Ch., Parganas P. (2020) Social media in sport management education: Introducing LinkedIn. *Journal of Hospitality, Leisure, Sport & Tourism Education* 27 (2020) 100262 <https://doi.org/10.1016/j.jhlste.2020.100262>
24. MacLeod, J., Yang, H. H., Zhu, S., & Li, Y. (2018). Understanding students' preferences toward the smart classroom learning environment: Development and

- validation of an instrument. *Computers & Education*, 122, 80–91. <https://doi.org/10.1016/j.compedu.2018.03.015>
25. Manca S. (2020) Snapping, pinning, liking or texting: Investigating social media in higher education beyond Facebook *The Internet and Higher Education*. Volume 44, 100707 <https://doi.org/10.1016/j.iheduc.2019.100707>
26. Mitsenko, D. (2019). «Blended learning» – the essence and features of implementation in higher education. *Herald of Kiev Institute of Business and Technology*, 42(3), 33-38. <https://doi.org/10.37203/kibit.2019.42.05>
27. Money, W. H., & Dean, B. P. (2019). Incorporating student population differences for effective online education: A content-based review and integrative model. *Computers & Education*. <https://doi.org/10.1016/j.compedu.2019.03.013>
28. Morris, N. P., Swinnerton, B., & Coop, T. (2019). Lecture recordings to support learning: A contested space between students and teachers. *Computers & Education*, 103604. <https://doi.org/10.1016/j.compedu.2019.103604>
29. Moskal, P., Dziuban, C., & Hartman, J. (2013). Blended learning: A dangerous idea? *The Internet and Higher Education*, 18, 15–23. <https://doi.org/10.1016/j.iheduc.2012.12.001>
30. Nalimova I., Valeev A. (2019) Possibilities of information technologies in blended learning for professionally oriented language at non-linguistic faculties. *Azimuth of Scientific Research: Pedagogy and Psychology*. V. 8. No 2(27). 168-171
31. Paulsen, J., & McCormick, A. C. (2020). Reassessing Disparities in Online Learner Student Engagement in Higher Education. *Educational Researcher*, 0013189X1989869. <https://doi.org/10.3102/0013189x19898690>
32. Popov N. P. (2018) Russian and American generations of the 20th century: where have Millennials come from? *Monitoring of Public Opinion: Economic and Social Changes*. No. 4. P. 309–323. <https://doi.org/10.14515/monitoring.2018.4.15>. (In Russian)
33. Romadhon, M. S., Rahmah, A., & Wirani, Y. (2019). Blended Learning System Using Social Media for College Student: A Case of Tahsin Education. *Procedia Computer Science*, 161, 160–167. <https://doi.org/10.1016/j.procs.2019.11.111>
34. Rospigliosi, P. asher. (2019). The role of social media as a learning environment in the fully functioning university: preparing for Generation Z. *Interactive Learning Environments*, 27(4), 429–431. <https://doi.org/10.1080/10494820.2019.1601849>
35. Ruliene L.N. (2017) Integration of technologies of electronic and classroom training as a factor of modern educational process development. *PNRPU Linguistics and Pedagogy Bulletin No. 4 2017* <https://doi.org/10.15593/2224-9389/2017.4.9>
36. Singh, H., & Miah, S. J. (2020). Smart education literature: A theoretical analysis. *Education and Information Technologies*. <https://doi.org/10.1007/s10639-020-10116-4>
37. Smith K. & Hill J. (2019) Defining the nature of blended learning through its depiction in current research, *Higher Education Research & Development*, 38:2, 383-397, <https://doi.org/10.1080/07294360.2018.1517732>
38. Tamim, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C., & Schmid, R. F. (2011). What Forty Years of Research Says About the Impact of Technology on Learning. *Review of Educational Research*, 81(1), 4–28. <https://doi.org/10.3102/0034654310393361>
39. Vanslambrouck, S., Zhu, C., Lombaerts, K., Philipsen, B., & Tondeur, J. (2017). Students' motivation and subjective task value of participating in online and blended learning environments. *The Internet and Higher Education*, 36, 33–40. <https://doi.org/10.1016/j.iheduc.2017.09.002>
40. Vogler, J. S., Munsell, S. E., & Knutson, D. (2019). LOLsquared: When laughing-out-loud and learning-on-line intermingle in a computer-mediated classroom discussion. *Computers & Education*, 140, 103597. <https://doi.org/10.1016/j.compedu.2019.103597>
41. Zydney, J. M., Warner, Z., & Angelone, L. (2019). Learning through experience: Using design based research to redesign protocols for blended synchronous learning environments. *Computers & Education*, 103678. <https://doi.org/10.1016/j.compedu.2019.103678>
-