A Comparative Analysis of the Usefulness of Moodle and MS Teams Platforms for Higher Education

Jarosław Kujawski
University of Gdansk
Gdansk. Poland   *jaroslaw.kujawski@ug.edu.pl*

Arleta Szadziewska
University of Gdansk
Gdansk. Poland   *arleta.szadziewska@ug.edu.pl*

Abstract

This paper describes the results of a questionnaire study conducted among accounting students at the Faculty of Management at the University of Gdansk, Poland, in May 2023. The questionnaires were physically distributed in classes and filled out on paper, yielding the response rate at 92.4% and totaling 97 respondents. The aim of the study was to compare students' perceptions of the usefulness and advantages of two digital educational platforms, namely Moodle and MS Teams. We found that, in the students' opinion, MS Teams garnered substantially more appreciation than Moodle as a very supportive tool for university-level education. Although both platforms are perceived as more supportive for general-purpose courses than specifically for accounting courses, MS Teams ranked higher in all categories of usefulness and advantages.

Keywords: education, accounting, MS Teams, Moodle, blended-learning.

1. Introduction

Nowadays, not only young people but also older individuals cannot imagine communication without the use of mobile phones, tablets, and web browsers. The Internet and digital technologies have permeated all areas of our lives, particularly contributing to a transformation in the approach to learning processes in higher education. New digital tools such as big data, digital platforms, interactive boards, and cloud computing not only impact teaching and learning processes but also enhance administrative procedures such as maintaining and circulating documentation, online registration, student services, and electronic grading systems [8].

Although the introduction of digitalization in higher education institutions (HEIs) has been observed since the end of the 20th century, its rapid acceleration occurred during the Covid-19 pandemic for obvious reasons. Since its onset, HEIs have had to transition from direct face-to-face interactions with students to online communication, encompassing both the provision of educational services and administrative support for universities. This transition presented a significant challenge for all HEIs and their employees, who were compelled to enhance their digital skills for teaching purposes.

As Gradišek and Polak [10] stated, teachers had to plan for distance learning, rationalize and adapt their course content, prepare teaching materials (text, video, audio), and devise creative solutions for assessing distance learning. Consequently, the ability to utilize digital educational platforms, such as Moodle or Microsoft Teams, has become a key issue in this altered reality. As Borawska-Kalbarczyk [6] argues, the use of such digital tools offers substantial opportunities for students to actively engage in the educational process, rather than merely passively receiving information from instructors. These platforms provide a range of configurable features to facilitate the creation of online courses, subject pages, workgroups, and learning communities [6].

Moodle and MS Teams belong to a broad group of Learning Management Systems (LMS) that are on-line tools designed to comprehensively manage educational processes

in terms of providing access to learning sources, administering training programs, facilitating progress analysis, knowledge dissemination, and organizing virtual classes.

The aim of the article is to present the results of a survey research on the usefulness of digital educational platforms in the higher education process. The survey, conducted among bachelor's and master's students of full-time and part-time studies at the Faculty of Management of the University of Gdansk in Poland, was intended to provide answers to the following issues:

1. What are the advantages and disadvantages of the Moodle Platform for supporting teaching classes at the University of Gdansk, according to students?
2. What are the advantages and disadvantages of the MS Teams Platform for supporting teaching classes at the University of Gdansk, according to students?
3. Which digital platform do students think is a better solution for conducting teaching classes at the University of Gdansk?

The choice of these two platforms for analysis stems from the fact that they are the only two official LMS tools supported by the university, even though they can be seen as serving different educational purposes and having different functionalities. The obtained survey results provide information on the usefulness of the digital platforms used at the University of Gdansk, both during the pandemic and currently, in the opinion of students.

The following research methods were employed in the work: analysis of literature on the usefulness of educational platforms in the higher education process, survey research, and selected methods of descriptive statistics.

The paper is organized as follows: the use of digital platforms in higher education institutions, research methods, analysis and discussion, and conclusions.

2.   The Use of Digital Platforms in Higher Education Institutions

As suggested by Annamdevula and Bellamkonda [3], higher education plays a vital role in the development of a country, as it enhances social, cultural, and economic development, promotes active citizenship, and instills ethical values in citizens. Therefore, improving the quality of education in higher education institutions through changes in curricula that reflect societal and technological advancements, particularly in the realm of dynamic digital technologies, is crucial.

Currently, the Internet and communication technologies directly participate in teaching and learning processes, either through online teaching or by supporting traditional teaching methods. Online teaching, or e-learning, involves distance learning using information and communication technologies. However, there are various ways of defining e-learning in the literature, considering the existence of its different forms [9, 13, 25]. A significant aspect to consider is accessibility during classes. Based on this criterion, e-learning modes can be distinguished [12], [25]:

– Synchronous: This mode enables students to work and consolidate knowledge in real-time (live) with immediate and real interactions through activities such as video lectures, teleconferences, discussion forums, and interactive virtual online classes.
– Asynchronous: This mode does not require the simultaneous presence of learners and the teacher. Examples include discussion forums, interactive multimedia courses, recorded lectures, or materials supporting independent learning.

Supporting traditional teaching, known as blended learning, combines face-to-face teaching with elements of virtual education. It is thus a modified form of e-learning conducted in an asynchronous mode. According to Szadziewska and Kujawski [22], "blended learning may take the form of simply distributing materials to participants or involving complex interactive workshops and training sessions that encourage participants to express their opinions in online discussions.".

Each of the teaching methods mentioned above utilizes digital platforms to conduct classes, which, as Piotrowski [18] states, "provide integrated support for six different activities: creation, organization, delivery, communication, collaboration, and assessment." Currently, the most popular platforms in higher education institutions, including those in Poland, are Moodle and MS Teams.

Moodle is an open-source Course Management System (CMS) accessible under the free GNU (General Public License). This means that Moodle can be downloaded at no cost and installed on as many servers as desired [22]. Due to its free license, ability to update without additional costs, and flexibility to adapt to users' current needs, Moodle is the most frequently used platform worldwide. According to information provided on the TOP LMS Software website (accessed in January 2024), Moodle boasts over 400 million users from 241 countries. Moreover, teachers utilize courses delivered via this platform in various ways, from merely distributing materials to organizing the entire teaching and learning process. This includes providing and collecting systematic knowledge, planning educational activities, checking participants' progress, and monitoring the entire course [22]. The effectiveness of Moodle in fulfilling these roles has been confirmed by numerous studies, the results of which indicate its abundant advantages as a tool enabling students [14], [17], [22], [23]:

– faster and improved communication with the teacher, leading to more effective learning of the content presented during classes,
– safer and easier access to materials covered during classes,
– more efficient use of time during classes.

MS Teams was originally designed for business needs as a collaborative workspace within Microsoft 365/Office 365. Due to the COVID-19 pandemic, it was quickly adapted for educational purposes. Currently, alongside the Moodle platform, MS Teams is one of the most frequently used tools in supporting higher education. As Stramkale [21] asserts, this popularity is attributed to MS Teams offering several unique features (such as creating channels, organizing group work, chatting, and sharing learning materials) that allow lecturers to create a diverse online learning environment for students. The effectiveness of MS Teams in teaching and learning processes is confirmed by numerous studies. For instance, in research by Annamdevula and Bellamkonda [3], students preparing to become teachers recognized the significant role of MS Teams in supporting interactive learning and facilitating feedback exchange [1]. Additionally, many students learning online report feeling more vocal and connected to their teachers and peers than they did in traditional classrooms. Teachers can utilize MS Teams apps and functions to support optimal working methods [1].

Results obtained by Rosak-Szyrocka et al. [20] confirmed easier and faster communication between course participants and lecturers, as well as improved access to materials. Similar outcomes were reported by studies conducted among students [3], [15], [17], [24]. The positive perception of MS Teams' importance in the educational process is influenced by its features, such as attractiveness, ease of use, user-friendliness, visual appeal, and access to digital information. Notably, functionalities like creating channels, organizing group work, conducting video meetings with students, and accessibility across various devices (phone, tablet, desktop, or browser) have increased MS Teams' popularity in teaching and learning processes during and after the Covid-19 pandemic.

However, it is important to acknowledge that the MS Teams platform also has disadvantages, including the necessity for teachers to possess digital skills to use the platform, potential costs associated with licensing, the requirement for appropriate infrastructure to conduct classes (ensuring each participant has suitable equipment and internet speed to minimize technical issues), and students' self-discipline and self-control in participating in classes and completing assignments [5], [21].

3. The Use of Digital Platforms at the University of Gdansk

The University of Gdańsk, as one of the largest universities in northern Poland, utilizes both platforms described above in the educational process. While the Moodle platform has been in use since 2004, MS Teams was introduced during the pandemic when conducting classes in university buildings was prohibited. By facilitating direct communication between teachers and students, MS Teams created learning conditions that closely resembled traditional face-to-face meetings. It is worth noting that the University of Gdańsk is one of the universities in Poland that received the prestigious title of "Microsoft

Cloud University" from Microsoft in April 2021. This designation signifies participation in a program dedicated to universities leveraging technological advancements in scientific, administrative, and research activities. Further details regarding courses supporting educational processes are provided in Table 1.

Table 1. Number of Academic Courses at the UG

Faculty/Year	Faculty of Management		University of Gdansk	
	2016	2023	2016	2023
Number of courses (Moodle)	495	760	1,684	3,801
Number of courses (MS Teams)	-	-	-	2,093
Number of teachers	149	146	1,711	1,788
Number of Moodle courses per teacher	3.3	5.2	0.98	2.13
Number of MS Teams courses per teacher	-	-	-	1.17

Data for Faculty of Management related to MS Teams was not collected

As depicted in Table 1, there was a notable increase in the number of courses conducted on the Moodle platform in 2023, with a rise of 265 courses, representing an increase of over 50%. Prompted by the spread of the Covid-19 virus in 2020, the University of Gdańsk swiftly initiated the use of the MS Teams platform for conducting classes and enabling real-time communication with teachers. We have since witnessed significant changes in education characterized by the adoption of digital methods to blend physical and online presence at our university. Now, this trend is evident not only in the increasing number of courses on the Moodle platform but also in the use of the MS Teams platform for conducting classes.

4.   Methods

The execution of the study involved a four-step procedure: review of relevant literature, preparation of questionnaire, conducting the questionnaire in paper form, and arranging the received responses along with preparing the final dataset in a working spreadsheet.

The questionnaire comprised 29 questions divided into 4 sections. The first section included 7 general questions concerning personal information. These questions aimed to identify the respondents and assess their familiarity with educational platforms used by the university. The second and third sections each contained 10 questions related to the students' knowledge and usage of the Moodle Platform and MS Teams, respectively. These questions had been earlier developed for the purpose of our previous studies on this subject described in [22[and [23] before the pandemic. The final 2 questions sought the students' perceptions regarding which platform they viewed as a better solution for education and their opinion on whether lectures and classes should be conducted online.

The survey was conducted during classes at the end of the spring semester in May 2023 at the Faculty of Management, University of Gdansk, Poland. Before distributing the questionnaire sheets to the students, the researcher briefly outlined the study scope and purpose, as indicated in the header. It took approximately 15 minutes for each student to respond to all questions. The filled-in paper sheets were then collected, and the answers were entered into a working spreadsheet for subsequent processing.

Descriptive statistics, descriptive narration, and final conclusions constitute the main body of the following two sections.

5.   Research Results and Discussion

A direct questionnaire method was employed as the primary research tool. The survey was conducted in May 2023 among three distinct groups of undergraduate and graduate students specializing in Accounting, as follows:
a) Full-time Bachelor in Accounting students (47 out of 51 persons participated).
b) Full-time MSc in ACCA Accounting students (16 out of 17 persons participated).
c) Part-time (extramural) MSc in Statutory Auditing students (34 out of 37 persons participated).

In total, 97 properly filled-out questionnaires were collected, representing 92.4% of all students in the respective groups. Further detailed information regarding these student groups is provided in Table 2.

Table 2. The Number of the Questionnaires Received and Response Rate

Type of students	Questionnaires received		
	Number of students	Number of the questionnaires received	The response rate
Full-time	68	63	92.6%
Part-time	37	34	91.9%
Total	105	97	92.4%

The responses were provided by 68 (70%) working students and 29 (30%) non-working students. Within the full-time student group, 35 (55.6%) were working students and 28 (44.4%) were non-working students, while in the part-time group, the distribution was 33 (97.1%) and 1 (2.9%), respectively. Overall, the dataset comprised 83 (85.6%) females and 14 (14.4%) males, with 94 students aged 20-30 (Generation Z) and 3 students aged 30-40 (Generation Y). Among the working students, there were: 2 trainees, 49 juniors (26 accountants and 23 assistants), 4 specialists, 2 salespersons, 1 tax consultant, 1 team leader, 4 in managing positions, and 2 in senior positions. Employment type was not revealed in 3 cases. Only 5 MSc students declared graduation from a university other than UG, with 3 cases not indicating their alma mater. Hence, we conclude that the remaining 89 students are familiar with the educational platforms operated by their current alma mater.

To assess the students' attitudes towards both educational platforms, we presented two multiple-choice questions on their advantages and drawbacks, each consisting of 8 suggested responses to choose from. Although the questions in Polish were originally phrased in full sentences in the questionnaire, their reduced English phrasing is provided in this paper for brevity.

Regarding the advantages of the Moodle Platform, both groups of students strongly agreed only on the aspect of easier access to teaching materials, which is consistent with previous studies by [4], [15], [19], [24]. This phenomenon is illustrated in Table 3.

Table 3. The Advantages of the Moodle Platform as Perceived by the Students

Type of advantage of the Moodle Platform	Full-time students (n=63)		Part-time students (n=34)		Total number of students (n=97)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Faster and better communication	26	41.3	11	32.4	37	38.1
Easier access to the teaching materials	51	81.0	23	67.6	74	76.3
Self-study of additional tasks	11	17.5	5	14.7	16	16.5
Effective use of lecture time	23	36.5	12	35.3	35	36.1
Better attention paid during lectures	22	34.9	14	41.2	36	37.1
Facilitates knowledge and skills acquisition	13	20.6	5	14.7	18	18.6
Better preparation for exams	16	25.4	11	32.4	27	27.8
Beneficial for self-development	13	20.6	7	20.6	20	20.6

Note: more than one answer was allowed!

Better communication, effective use of lecture time, and improved attention during lectures are considered the most important advantages of Moodle, while other aspects received less appreciation. Similar research results were obtained by Piotrowski [18]. However, in research conducted by Kazanidis et al. [14], respondents indicated that email or Facebook were better communication sources with teachers, although they found the Moodle platform to be a relatively easy and effective tool for distributing materials. Additionally, results from Hudrea et al. [11] confirmed the usefulness of Moodle in supporting various educational activities "due to its comprehensive suite of tools and features required to create and manage online courses," with 38.5% of respondents preferring to use this tool in their learning management system.

Regarding the MS Teams system, strong student support was observed for four main aspects: faster and better communication, easier access to the teaching materials, effective use of lecture time, and better attention paid during lectures. This is illustrated in Table 4.

Table 4. The Advantages of MS Teams as Perceived by the Students

Type of advantage of MS Teams	Full-time students (n=63)		Part-time students (n=34)		Total number of students (n=97)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Faster and better communication	59	93.7	32	94.1	91	93.8
Easier access to the teaching materials	62	98.4	30	88.2	92	94.8
Self-study of additional tasks	15	23.8	12	35.3	27	27.8
Effective use of lecture time	39	61.9	28	82.4	67	69.1
Better attention paid during lectures	38	60.3	19	55.9	57	58.8
Facilitates knowledge and skills acquisition	23	36.5	16	47.1	39	40.2
Better preparation for exams	28	44.4	19	55.9	47	48.5
Beneficial for self-development	22	34.9	14	41.2	38	37.1

Note: more than one answer was allowed!

What is worth emphasizing is that part-time students are more likely to appreciate the advantages mentioned above, but they also tend to value all the advantages of MS Teams more highly. Both groups of students are inclined to assign greater appreciation to MS Teams than to Moodle, which is not surprising considering the relative novelty of the former. As indicated by the data in Table 4, the benefits of using the MS Teams platform include faster and improved communication between participants in the teaching process. Moreover, this method of conducting classes allows for direct contact, creating the impression of face-to-face meetings. This is also corroborated by research conducted by [20], wherein students highly rated the ability to communicate using this platform both among themselves and with teachers. In contrast, results obtained by Rojabi [19] indicate that interaction between participants in online classes may be limited.

Subsequently, our comparison between the two platforms shifts to their disadvantages. Table 5 shows the perceived drawbacks of the Moodle Platform, and Table 6 depicts the perceived drawbacks of MS Teams.

Table 5. The Drawbacks of the Moodle Platform as Perceived by the Students

Type of drawback of the Moodle Platform	Full-time students (n=63)		Part-time students (n=34)		Total number of students (n=97)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Log-in problems	12	19.0	11	32.4	23	23.7
Download problems	5	7.9	3	8.8	8	8.2
Not enough materials available	25	39.7	16	47.1	41	42.3
No solutions to tests and tasks	40	63.5	21	61.8	61	62.9
User-unfriendly interface	24	38.1	12	35.3	36	37.1
Lower motivation to learn	1	1.6	2	5.9	3	3.1
Lower creativity in searching for knowledge	3	4.8	4	11.8	7	7.2
No direct communication with other participants	13	20.6	18	52.9	31	32.0

Note: more than one answer was allowed!

As shown in Table 6, download problems, not enough materials available, no solutions to tests and tasks, and no direct communication with other participants are the aspects of Moodle that receive the most negative connotations. Additionally, for part-time students, the absence of direct communication with other participants emerges as particularly important. The assessment outcomes of similar drawbacks of Moodle are presented in Table 6.

Table 6. The Drawbacks of the MST as Perceived by the Students

Type of drawback of MS Teams	Full-time students (n=63)		Part-time students (n=34)		Total number of students (n=97)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Log-in problems	16	25.4	7	20.6	23	23.7
Download problems	9	14.3	2	5.9	11	11.3
Not enough materials available	14	22.2	14	41.2	28	28.9
No solutions to tests and tasks	34	54.0	16	47.1	50	51.5
User-unfriendly interface	1	1.6	1	2.9	2	2.1
Lower motivation to learn	4	6.3	0	0.0	4	4.1
Lower creativity in searching for knowledge	2	3.2	2	5.9	4	4.1
No direct communication with other participants	3	4.8	4	11.8	7	7.2

Note: more than one answer was allowed!

The distribution of indications concerning MS Teams follows a similar pattern, though

with one major difference. For obvious reasons, the argument of the non-existence of direct communication with other participants cannot be valid for MST, as the underlying assumption of the platform is direct communication through pictures, voices, and cameras, provided that all students are active and online.

It should also be noted that one of the disadvantages of online teaching on each of the above-mentioned platforms are technical problems, such as Internet connection issues and insufficient technical equipment. This is confirmed by studies conducted by [10], [16], [21], [24].

To assess the perceived usefulness of both platforms in educational processes at UG, we employed a 5-step Likert scale, offering students the following assessment options: 1 - no, 2 - weak, 3 - medium, 4 - strong, 5 - very strong.

Table 7 presents the basic descriptive statistics for the usefulness of the Moodle platform in the educational process at UG, according to the students' opinions.

Table 7. The Usefulness of the Moodle Platform as Perceived by the Students

Perceived usefulness of the Moodle Platform	Full-time students (n=63)					Part-time students (n=34)					Total number of students (n=97)				
	Mn	Md	Ma	Mi	SD	Mn	Md	Ma	Mi	SD	Mn	Md	Ma	Mi	SD
Usefulness of the MP at UG in general	3.30	4	5	1	0.96	3.06	3	5	1	1.07	3.22	3	5	1	1.00
Usefulness of the MP at UG for accounting	2.83	3	5	1	1.16	2.91	3	5	1	1.08	2.86	3	5	1	1.13

Mn=Mean; Md=Median; Ma=Max; Mi=Min; SD=Standard Deviation

As suggested by the outcomes displayed in Table 8, the usefulness of the Moodle Platform for general educational purposes was slightly better assessed than that for accounting courses. There appears to be no significant dispersion in that opinion between the two groups of students, although full-time students are more inclined towards general usage and less inclined towards accounting usage of this platform at UG compared to part-time students.

Subsequently, Table 8 presents the basic descriptive statistics for the usefulness of MS Teams in the educational process at UG, according to the students' opinions.

Table 8. The Usefulness of the MS Teams as Perceived by the Students

Perceived usefulness of the MS Teams	Full-time students (n=63)					Part-time students (n=34)					Total number of students (n=97)				
	Mn	Md	Ma	Mi	SD	Mn	Md	Ma	Mi	SD	Mn	Md	Ma	Mi	SD
Usefulness of the MST at UG in general	4.43	4	5	3	0.53	4.41	4	5	3	0.61	4.42	4	5	3	0.56
Usefulness of the MST at UG for accounting	4.13	4	5	2	0.73	4.35	4	5	2	0.73	4.21	4	5	2	0.74

Mn=Mean; Md=Median; Ma=Max; Mi=Min; SD=Standard Deviation

The data in Table 8 shows that the dispersion of answers given by the students is even more reduced compared to the assessment of the former platform. It can be stated that there is strong acceptance for MST in education at both the UG level and for accounting courses only. Once again, part-time students are more likely to acknowledge the usefulness of MST for accounting courses compared to full-time students.

6. Conclusions

Currently, digitalization determines the future direction of the development of higher education in all its aspects, with particular emphasis put on educational processes. This is because conventional teaching and learning methods are insufficient in an increasingly digital world. Educational platforms play an important role in these processes, in which, as Rosak-Szyrocka et al. [20] states, "both teaching professionals and students are virtually connected with each other." This method of communication allows both institutions and educators to adapt both to crisis situations in which direct contact (face to face) between teachers and students is impossible as well as ordinary circumstances in which traditional teaching is not commercially desirable.

The purpose of the paper was to assess the usefulness, advantages, and disadvantages

of the only two official educational platforms used at the University of Gdańsk (UG), namely MS Teams and Moodle, from the perspective of finance and accounting students. A questionnaire study was conducted, resulting in 97 responses. The study revealed that faster and better communication, easier access to teaching materials, effective use of lecture time, and better attention paid during lectures are the four principal advantages of MS Teams, significantly surpassing those of the Moodle platform. Both platforms were criticized for login problems, insufficient availability of materials, and solutions to tests and tasks. Additionally, the Moodle platform was heavily negatively perceived due to the lack of direct communication with other participants.

This study contributes to a better understanding of students' opinions on the use of the two popular educational platforms and the degree to which students accept their usage. The results suggest a widely accepted need for using MS Teams in the educational process for university courses, particularly for finance and accounting majors.

This study can also be the basis for further research into the use of both platforms simultaneously for the same educational purpose. The aspects of using them in conjunction for the purpose of same educational effects are not widely existent in current literature.

However, the research has several limitations. These include the size of the surveyed sample, as only 97 students from selected specialties of one university participated. Therefore, the results cannot be generalized to the entire Faculty of Management of the University of Gdańsk or the entire university. Further research is needed to expand the study to other faculties of the University of Gdańsk and other universities in Poland. Additionally, the study only included students, not academics. Determining the usefulness of selected digital platforms in the learning and teaching process requires examining the opinions of all participants. Thus, further studies on the usefulness, availability, and use of the Moodle and MS Teams platforms are needed from both national and worldwide perspectives.

References

1. Alfailakawi, A.: MS Teams' Development Application Trends as a Quality Education in Light of the Epidemiological Challenges (Covid-19) in Kuwait. In: Global Journal of Educational Studies 8 (2), 144-167 (2022)
2. Almodaires, A. A., Almutairi, F. M., Almsaud, T. E. A.: Pre-Service Teachers' Perceptions of the Effectiveness of Microsoft Teams for Remote Learning. In: International Education Studies 14 (9), 108-121 (2021)
3. Annamdevula, S., Bellamkonda, R. S.: Effect of student perceived service quality on student satisfaction, loyalty and motivation in Indian universities Development of HiEduQual. In: Journal of Modelling in Management 11 (2), 488-517 (2016)
4. Baker, L. A., Spencely, C.: Blending Microsoft Teams with Existing Teaching Environments to Increase Access, Inclusivity and Engagement. In: Journal of the Foundation Year Network 3, 3-20 (2020)
5. Bączek, M., Zagańczyk-Bączek, M., Szpringer, M., Jaroszyński, A., Wożakowska-Kapłon, B.: Students' perception of online learning during the COVID-19 pandemic: A survey study of Polish medical students Medicine, (2021)
6. Borawska-Kalbarczyk, K.: Proces kształcenia w cyfrowej rzeczywistości – wybrane kierunki zmian, Wyd. Uniwersytetu w Białymstoku, pp. 97-115 (2021)
7. Costa, C., Alvelosa, H., Teixeira, L.: The use of Moodle e-learning platform: a study in a Portuguese University. In: Procedia Technology 5, 334–343 (2012)
8. Glushenkova, M., Zagato, M.: Effect of COVID-19 on digitalisation of higher education. A tale of one business school. In: Journal of University Teaching & Learning Practice 20 (6) (2023)
9. Grabania-Mukerji, M.: E-learning w edukacji, https://www.ejournals.eu/ZG/2011/Zeszyt-3/art/5778/ Zeszyty Glottodydaktyczne, Zeszyt 3 (2011)
10. Gradišek, P., Polak, A.: Insights into learning and examination experience of higher education students during the Covid-19 pandemic. In: Journal of Contemporary Educational Studies 72 (138), 286-307 (2021)

11. Hudrea, A., Spoaller, D., Urs, N.: Digital Tools in Romanian Higher Education: The Influence of the COVID-19 Pandemic on the Digitalization of Universities. In: Transylvanian Review of Administrative Sciences 69, 44-63 (2023)

12. Huynh, T., Tran, L. T.: Digitalisation of the Teaching and Learning for International Students in Higher Education: A Systematic Review. In: Journal of Comparative & International Higher Education 15 (3), 63-80 (2023)

13. Jodłowski, Ł.: Wykorzystanie platformy edukacyjnej Moodle do prowadzenia zdalnych szkoleń bibliotecznych w Bibliotece Uniwersyteckiej we Wrocławiu (2015)

14. Kazanidis, I., Pellas, N., Fotaris, P., Tsinakos, A.: Facebook and Moodle Integration into Instructional Media Design Courses: A Comparative Analysis of Students' Learning Experiences using the Community of Inquiry (CoI) Model. In: International Journal of Human-Computer Interaction 34 (10), 932–942 (2018)

15. Khidir, M. L. B. M., Sa'ari, S. N. B., Mohammad, A. S. B.: Effectiveness of online learning with Microsoft Team Applications in Polimas. IN: EPRA International Journal of Environmental Economics, Commerce and Educational Management (2022)

16. Pertiwi, W. A., Taufiq, A., Meganingtyas, D. E. W., Meiningdias, C. Y.: Student Perspectives on Using Microsoft Teams as an Alternative to the Implementation of Science Practicum. In: Journal of Physics: Conference Series, (2022)

17. Petrovic, N., Jeremic, V., Cirovic, M., Radojicic, Z., Milenkovic, N.: Facebook versus Moodle in practice. In: American Journal of Distance Education, 28 (2), 117-125 (2014)

18. Piotrowski, M.: What is an e-learning platform? In: Learning management system technologies and software solutions for online teaching: tools and applications, I. Global, Editor (2010)

19. Rojabi, A. R.: Exploring EFL students' perception of online learning via Microsoft Teams: University level in Indonesia. In: English Language Teaching Educational Journal, 3 (2), 163- 173 (2020)

20. Rosak-Szyrocka, J., Żywiołek, J., Zaborski, A., Chowdhury, S., Hu, Y.-Ch.: Digitalization of Higher Education Around the Globe During Covid-19. In: IEEE Access (2022)

21. Stramkale, L.: University Students' Perspectives on Online Learning via the Microsoft Teams Platform. In: Journal of Education Culture and Society No. 1, 400-414 (2023)

22. Szadziewska, A., Kujawski, J.: The Usefulness of the Blended-learning Method in the Opinion of Full-time Students of the Gdansk University. In: Proceedings of EDULEARN 2016 Conference, 1792-1801 (2016)

23. Szadziewska, A., Kujawski, J.: Advantages and Disadvantages of the Blended-learning Method Used in the Educational Process at the Faculty of Management at the University of Gdansk In the Opinion of Undergraduate Students. In: Proceedings of ICERI 2017 Conference, Seville, Spain (2017)

24. Wea, K. N., Kuki, A. D.: Students' perceptions of using Microsoft Teams application in online learning during the COVID-19 pandemic. In: Journal of Physics: Conference Series, 1842, (2020)

25. Wodecki, A.: Po co e-learning na uczelni? In: E-learning w kształceniu akademickim. Ed. M. Dąbrowski, M. Zając. In: 2nd National Conference Rozwój e-edukacji w ekonomicznym szkolnictwie wyższym (in Polish). Fundacja Promocji i Akredytacji Kierunków Ekonomicznych, Warszawa (2006)