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WHAT WE KNOW AFTER THE PANDEMIC. ONLINE AND FACE-TO-FACE TESTING IN COMPARATIVE PERSPECTIVE

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Abstract. *The article aims to find out the impact of online education on on-site education by analyzing the results achieved by the respondents in the tests. We used descriptive statistical methods to analyze the data. The reason was that such methods allow us to better understand the correlation between the results obtained in traditional testing and online testing. The research was conducted in the summer semester of the academic years 2020/2021 and 2021/2022. 2508 students of the University of Economics in Bratislava participated in the research. The respondents were first-year Bachelor's degree students at the University of Economics in Bratislava whose first foreign language was professional English. When analyzing the data we took into* For *account the test results, the number of students who did not take the test, the number of students who had to retake the test, and the number of students who did not take the test. The results confirmed that students who took the test in the home environment performed significantly better than students who took the test in person at the university. The results of on-site education were influenced by the online learning process. As students adapted to the online environment, they changed their study*

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habits, which had a negative impact on learning. This negative impact was also reflected in the results of the on-site testing. The solution to this situation is to better prepare teachers for online learning and to ensure that schools are equipped with the latest technology.

Keywords: *pandemic, e-test, Moodle, formative assessment, summative assessment, online, on-site*

1. INTRODUCTION

In the article, we focused the research on two different environments, an online and on-site environment, and their impact on the educational outputs. The literature review confirmed that it is essential to address the issue of online learning. Even before the pandemic, several authors had already explored the use of modern communication technologies in the didactic process (Arquero, Romero-Frías, 2013; Hrdličková, 2018; Ifinedo, 2018; Sokolova, Ševečková, 2019; Štefančík, Stradiotová, 2020; Blokhovtsova et al., 2016). However, the pandemic COVID-19 accelerated the use of information and communication technologies to a greater extent. With the use of technology in the online education process, the scope for research on the impact of this educational process has opened up. Testing the students' knowledge in online education has been addressed by several researchers. The gap in the research is seen when comparing the impacts of online learning to on-site learning. In the paper, we look at the impact of the covid-19 pandemic on the results of the educational process by analyzing the results achieved by the respondents in the tests.

The COVID-19 pandemic broke out in 2019 and caused virtually all educational institutions to move from face-to-face to online learning. Schools and universities were physically closed to prevent the spread of COVID-19. It was a transformation that no one was prepared for (Organisation for Economic Co-operation and Development [OECD], 2020; United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020).

Teachers had to change their teaching practice from day to day to online, which resulted in the situation in which teachers had to adapt to new conditions, change their teaching methods, and find alternative ways of monitoring students' learning processes (König et al., 2020; OECD, 2020; Zubro, 2018). This sudden shift especially affected older teachers whose digital skills were not at a sufficient level. It even affected those whose digital skills were at a good level but were not prepared for learning through Web 2.0 applications such as ZOOM, MS Teams, Google meet, Google forms, iSpring Learn, WebTutor, Teachbase, Memberlux, Moodle open-source platform or other platforms (Van der Spoel et al., 2020; Tarasova et al., 2022; Milenkova, Manov, 2022; Morozova et al., 2020; Sivakumar, 2019; Basetty et al, 2020).

Teachers had to become familiar with the communication applications and the possibilities that these applications allowed them in the online learning process in a short period. In addition to educating themselves on online communication applications, they also had to introduce these applications to the students. Learning in the online space is a major challenge for teachers who have to find ways to get as close as possible to face-to-face

learning, especially in terms of involving all students in the learning process, guiding and monitoring student learning (König et al., 2020; Frehywot, 2013) and they also have to change their assessment practices (OECD, 2020).

Assessment, according to Brown (1990), refers to a series of measures used to collect and interpret information about a student's educational attainment and achievement of educational goals.

Assessment, whether formative or summative, should be designed in such a way that through assessment we can find out how students understand the discussed topics and what they know about the topics, and how they can apply the critical thinking, acquired knowledge, and skills in practice (Svensäter, Rohlin, 2022; Oltra-Massuet et al, 2022; Anziani, 2008). We can measure the results of the learning process in several ways. The most common ways of measuring knowledge are formative and summative assessments. Formative assessment is seen as a means that allows the teacher to guide and monitor the learning process in both face-to-face and online spaces (Veugen, Gulikers, den Brok, 2022; Anziani et.al., 2008).

Formative assessment refers to tools used during a class or course that identify misconceptions, problems, and gaps in learning while assessing ways to eliminate those gaps. Formative assessment can help a student take responsibility for his or her learning if he or she understands that the goal is to improve learning, not to increase final grades. Examples of formative assessment are discussion, homework, research, group work, and quizzes (Trumbull, Lash, 2013).

Summative assessment, unlike formative assessment, assesses student learning, knowledge, skills, or achievement after a project, lesson, course, or program. Summative assessments are almost always formally graded and, along with formative assessments, identify where a student is on the path to achieving a goal and whether they can apply the knowledge they have gained in practice. Based on the results of the assessments, the student learns whether his or her knowledge is sufficient, and gains motivation for greater learning engagement (Bath, Bath, 2019).

Literature review

The coronavirus pandemic has threatened not only the global economy but also societies around the world and specific institutions, including schools. The COVID-19 pandemic has greatly affected the entire education system. It has affected all types of schools, from kindergartens to universities, and has had a serious impact on the course of the educational process, which has moved from schools to the home environment. Abudalfa and Salem (2022) argue that the COVID -19 pandemic has ushered in a new era of education which is called "e-learning" that provides flexible, low-cost, user-centered, and easily updated learning via information and communication technology (Ruggeri et al., 2013; Hijril. et al., 2020). We agree with this assertion, but only to the extent that e-learning became the dominant form of the educational process during the pandemic. E-learning has been in use since the last century, but the challenges arising from the pandemic kick-started the use of e-learning to a greater extent. The goal of online learning was not only to educate but also to

limit the spread of COVID-19 (Almossa, Alzahrani, 2022; Ali, H. A., Mohamed, 2023, Omar, Musa, Mohamad, Che Cob, Othman, Ramli, 2022; Zhou, Zhu, Zhou, 2022).

Assessment is important feedback for students and has an impact on the development of the skills needed to become successful learners. Well-designed assessment task is essential to students' experiences and their developing perceptions of themselves as learners and potential future graduates (Kearney, 2013). These experiences have tremendous potential to influence students' self-confidence (Gill, 2015). Questions of how to ensure the quality of online learning and also how to provide an assessment of knowledge that truly reflects what students know have come to the forefront among practitioners (De Santos-Berbel, Hernando García, De Santos-Berbel, 2022). The reason for these questions and consequent discussions was the rapid transition from face-to-face instruction to online instruction that took place in a virtual classroom in a home environment. Experts were concerned that the change might lead to less satisfactory learning outcomes, not only because of the rapid change in the learning environment but also because of online technologies that were not mastered by either teachers or students, i.e. these online technologies might not be used in the right way (Ali, Mohamed, Abdelhamid, Ourdani, Alami, 2022; Shaaban, Jalambo, 2022; Amer & Abu Jaber, 2012).

Teaching in virtual classrooms during the pandemic had an impact on the development of new assessment practices (Cahapay, 2020; Gikandi et al., 2011; Khalaf, 2020). Recent studies have shown that teachers used more formative assessments in online teaching during the pandemic (Cahapay, 2020; Zou et al, 2021). This is because formative assessment as a continuous process of gathering information about learning, analyzing and interpreting that information, and making better decisions for further learning (Black, Wiliam, 2009) allows for improving the online learning process. Formative assessment provides teachers with important information about what students need to focus on in online learning and based on this, the teacher can tailor instruction and lesson plans to meet these needs. In other words, it has offered teachers the ways to engage, guide, and monitor students in online learning (Chen et al., 2021). Another reason why teachers used formative assessment more than other assessments in online teaching was to overcome the difficulties experienced when using summative assessment online. Not only did teachers face problems with the reliability and validity of online summative assessments (Gikandi et al., 2011), but they also often struggled with how to interpret the results of summative assessments due to the often inappropriate home environment and organizational challenges (Kinzie, 2020). Shifts in assessment practice are likely to change future assessment practices, with formative assessment taking a more prominent place in monitoring student learning (Cahapay, 2020; Veugen et al., 2021).

2. METHODS

The researchers used quantitative data analysis methods in examining the testing. The reason was that such a method allows for a better understanding of the correlation between the results obtained in traditional testing and online testing.

We established H0 (null hypothesis): Students will achieve better results when they take the e-test via moodle platform in the home environment

H1 (alternative hypothesis): Students will perform better results when they take the e-test via moodle platform on-site at the university

The **aim** of the research was to find out what impact had online education on learning outcomes by analysing the results of testing conducted via e-test in two different environments, a home environment, and a university environment.

2.1 Participants

Participants in the research were 1453 students out of 1729 enrolled students in the summer term (ST) in the academic year 2020/2021 and 1055 students out of 1254 enrolled students in the academic year 2021/2022 (ST). In the academic year 2020/2021 (ST), online testing was conducted via MS Teams and via e-test. In the summer term 2021/2022, testing via e-test was conducted on-site at the university. The respondents were first-year Bachelor's degree students at the University of Economics in Bratislava whose first foreign language is English. Students were studying professional English.

2.2 Apparatus and materials

The testing was conducted in two contrast modes - online and on-site. The tests that were used had the same form in the on-site and the online testing so that we could compare the test results. The test consisted of 3 parts. The first part was aimed at testing the respondents' knowledge of English grammar. The second part of the test focused on the respondents' knowledge of vocabulary. The exercises that were used in this part are sentence completion, matching, and short answer. The final part focused on the respondents' ability to work with the text, i.e. here we tested reading comprehension. We used the exercise drag and drop into text exercise.

2.3 Procedure

In the research, we focused on comparing the test scores achieved by students in two different environments, an online and an on-site environment. In both cases, we kept the same rules in testing. The test had the same format. It was conducted via the e-test in the platform Moodle. The respondents had the same time to complete the test, 70 minutes. Each student had the opportunity to take the test twice, one in the due period and the second in case he/she failed the test. The difference was in the environment in which the test took place. In the summer term of 2020/2021, the testing was conducted online. Students took the e-test in a home environment. They connected to the exam via the Microsoft MS Teams application. Before the actual exam, a teacher checked student attendance. The student was also required to show his/her ISIC student card to ensure that she/he was registered for the exam. Students were not allowed to use headphones or cell phones during the test. This was due to possible cheating attempts. In Table 1 we see the numbers of respondents and the results they achieved during the testing.

In the summer term 2021/2022, students and teachers return to the university. The educational process continued on-site. The testing was conducted in lecture halls. Students brought computers to the exam. If a student did not have a computer, a school computer was loaned to them. The test was administered via the e-test application. The format of the test was the same as the test that was conducted in the summer term 2020/2021, i.e. the test consisted of 3 parts that were aimed at testing students' knowledge in grammar, vocabulary, and reading comprehension. Table 2 shows the number of students who took part in the testing and the results obtained.

3. RESULTS

The research was conducted in the academic years 2020/2021 and 2021/2022 in the summer semester. We investigated the test scores of students' performance in a professional English language exam that was administered in two different environments, online and on-site. To maintain the validity of the research, we used data from AIS and examined the results of the respondents from the 2 summer semesters 2020/2021 and 2021/2022. The exam in the summer semester of 2020/2021 was conducted online and the exam in the summer semester of 2021/2022 was conducted in an on-site setting.

In analyzing the data, we took into account the number of students who were enrolled in the English language course, the number of students who took the test, the number of students who passed the test in the due period, the number of students who passed the test in the resit, the number of students who did not attend the class and were not admitted to the exam. Such students were given a grade of X. In addition to the number of students who took the exam, we also compared achievement through the grades awarded.

In the summer semester of 2020/2021, 1453 respondents took the test in the Professional English Language. The exam was conducted online via the platform e-test. During the testing, students were not at the university premises. They took the exam at home. The students who sat for the exam in the summer semester of 2020/2021 were admitted to the university without an admission procedure, which was cancelled due to the pandemic and had more than one year of experience with online learning. This situation was reflected not only in the number of students who enrolled at the university but also in the number of students (1729) who chose professional English as their first language. Collected data achieved from AIS we can see in Table 1. There is information about the number of students and exam results.

Table 1. Online testing 2020/2021

semester	number of st-s	in due time	resit	X	A	B	C	D	E	FX
ST 2020/ 2021	1729/ 1453	1215	238	276	143	303	381	322	179	125
	84%	83,6%	16,4%	15,9%	9,8%	20,9%	26,3%	22,1%	12,3%	8,6%

In the summer semester 2021/2022, 1055 respondents sat for the test in professional English. They took the test on-site at the university premises. The exam was conducted online via the platform e-test. These students were admitted to the university on the basis of the results of the admission process, which was conducted online due to the pandemic. Respondents who were admitted to the university had virtually 2 years of experience in online education and examination. They experienced an on-site examination for the first time after two years of online education. These factors influenced their test results which we see in Table 2.

Table 2. On-site testing 2021/2022

semester	number of students	in due time	resit	X	A	B	C	D	E	FX
LS 2021/ 2022	1254/ 1055	947	307	199	107	170	232	228	96	222
	84,1%	75,5%	24,5%	15,8%	10,1%	16,1%	22%	21,6%	9,1%	21,1%

The data presented in the tables were the basis for the statistical evaluation of the data obtained. We used descriptive statistical methods to analyze the data. We focused on evaluating the median, quartiles, mean absolute deviation, and standard deviation for both environments in which the testing took place, i.e., in both the online and on-site environments. The aim of statistical evaluation of the data is to confirm or refute H0. The results can be seen in Table 3 (Online testing) and 4 (On-site testing)

Table 3. Online testing

	ni	**Ni**	**xi´**	**xi´*ni**	**|xi´- x̄ |*ni**	**(xi´- x̄)^2*ni**	**fi**
0-20	446	446	10	4460	12658,66483	359287	0,306951
20-40	381	827	30	11430	3193,792154	26772	0,262216
40-60	322	1149	50	16100	3740,784584	43458	0,22161
60-80	179	1328	70	12530	5659,504474	178938	0,123193
80-100	125	1453	90	11250	6452,167928	333044	0,086029
	1453	x	x	55770	31704,91397	941499	1

AVERAGE NUMBER OF POINTS

$\bar{x} = \Sigma (xi´*ni)/n$

$\bar{x} = 1453/55770 = 38,382$

The average score obtained by students in this form of testing is 38.38.

MEDIAN

The median represents the middle value of an ordered statistical set. The Median is the point that divides the entire data into two halves. One-half of the data is less than the median, and the other half is greater than the same. Half of the students have a score of 58.19 or less, and half of the students have a score of 58.19 or more.

$\tilde{\boldsymbol{x}} = \boldsymbol{a}_{\tilde{x}} + \boldsymbol{h}_{\tilde{x}} * \frac{\boldsymbol{r}-\boldsymbol{N}_{\tilde{x}-1}}{\boldsymbol{n}_{\tilde{x}}}$

$\boldsymbol{r} = \frac{\boldsymbol{k}}{\boldsymbol{\alpha}} * \boldsymbol{n} \ \rightarrow \ \boldsymbol{r} = \left(\frac{\boldsymbol{1}}{\boldsymbol{2}}\right) * \boldsymbol{n}$

r = $\left(\frac{\boldsymbol{1}}{\boldsymbol{2}}\right) * \boldsymbol{n}$ = (1/2)*1453 = 726,5

Med (x) = 60+20*((726,5-827)/322) = 33,757

Half of the students have 33.76 points or less and half of the students have 33.76 points or more.

QUARTILES (Q1, Q3)

r1=k/α*n → r=(1/4)*n = (1/4)*1453 = 363.25

r3=k/α*n → r=(3/4)*n= (3/4)*1453 = 1089.75

Q1 =a_$\tilde{x}$ +h_$\tilde{x}$ *(r-N_($\tilde{x}$-1))/n_$\tilde{x}$ = 20+20*((363.25-446)/381) = 15.656

Q3 = a_$\tilde{x}$ +h_$\tilde{x}$ *(r-N_($\tilde{x}$-1))/n_$\tilde{x}$ = 51+9* ((1089.75-1149)/179) = 53, 379

Lower quartile (Q1) - 25% of students scored 15.66 or less and 75% of students scored 15.66 or more. Upper quartile (Q3) - 75% of students scored 53.38 points or more and 25% of students scored 53.38 points or more. The lower quartile, or first quartile (Q1), is the value under which 25% of data points are found when they are arranged in increasing order. The upper quartile, or third quartile (Q3), is the value under which 75% of data points are found when arranged in increasing order.

Average Absolute Deviation ($\bar{d}$)

The Absolute Deviation from the Mean (MAD), describes the variation in the data set, in the sense that it tells the average absolute distance of each data point in the set. In the on-site testing, it is 19,97.

$\bar{d} = \frac{1}{n} * \sum|x_i' - \bar{x}| * n_i$

$\bar{d}$= (1/1453)* 31704,91397 = 21,820

The scores of individual students differ from the mean by an average of 21.82 points.

MODERATE DIFFERENCE (s)

Standard deviation (s)

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S^2=(1/n)*∑(x_i^'-x ̅)^2*n_i
s = √((s^2))

s^2 = (1/1453)*941499 = 647,969
s = √((s^2)) = √((647,969)) = 25,455

Students' scores during online testing varied by an average of 25.46 points.

BOXPLOT

	Med.	**Diff.**
Q0 (Min.)	0	0
Q1	15,65617	15,65617
Q2 (Med.)	33,75776	18,1016
Q3	53,37989	19,62212
Q4 (Max.)	100	46,62011

This row represents the difference between datasets:
i.e. 15,65617– 0 = 15,65617;
33,75776 - 15,65617 = 18,1016; etc.

- **Minimum (Q_0)** represents the lowest data point in the data set excluding any outliers
- **Maximum (Q_4)** represents the highest data point in the data set excluding any outliers
- **The Median (Q_2)** represents the middle value in the data set
- **The lower quartile (Q_1)**: is the median of the lower half of the dataset
- **The upper quartile (Q_3)**: is the median of the upper half of the dataset
- **Interquartile range (IQR)** is the distance between the upper and lower quartiles

$\boldsymbol{r1} = \frac{\boldsymbol{k}}{\boldsymbol{\alpha}} * \boldsymbol{n} \rightarrow \boldsymbol{r} = \left(\frac{\boldsymbol{1}}{\boldsymbol{4}}\right) * \boldsymbol{n}$ = (1/4)*1453 = 363,25
r2 = $\left(\frac{\boldsymbol{1}}{\boldsymbol{2}}\right) * \boldsymbol{n}$ = (1/2)*1453 = 726,5
$\boldsymbol{r3} = \frac{\boldsymbol{k}}{\boldsymbol{\alpha}} * \boldsymbol{n} \rightarrow \boldsymbol{r} = \left(\frac{\boldsymbol{3}}{\boldsymbol{4}}\right) * \boldsymbol{n}$ = (3/4)*1453 = 1089.75

Q_0 (Min.) = 0
$Q_1 = \boldsymbol{a_{\tilde{x}}} + \boldsymbol{h_{\tilde{x}}} * \frac{\boldsymbol{r}-\boldsymbol{N_{\tilde{x}-1}}}{\boldsymbol{n_{\tilde{x}}}}$ = 20+20*((363,25-446)/381) = 15,656
Q2 = Med (x) = $a_{\tilde{x}} + h_{\tilde{x}} * \frac{r-N_{\tilde{x}-1}}{n_{\tilde{x}}}$ = 60+20*((726,5-827)/322) = 33,757
Q3 = $\boldsymbol{a_{\tilde{x}}} + \boldsymbol{h_{\tilde{x}}} * \frac{\boldsymbol{r}-\boldsymbol{N_{\tilde{x}-1}}}{\boldsymbol{n_{\tilde{x}}}}$ = 51+9* ((1089.75-1149)/179) = 53, 379
Q_4 (Max.) = 100

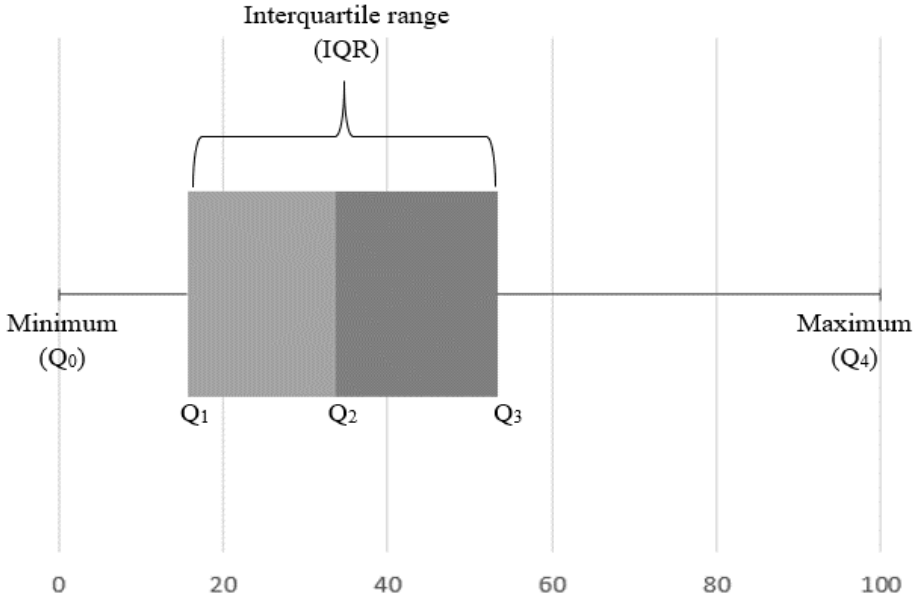


Table 4. On-site testing

	ni	Ni	xi´	xi´*ni	lxi´- x̄ l*ni	(xi´- x̄)^2*ni	fi
0-20	277	277	10	2770	9788,208531	345881	0,262559
20-40	232	509	30	6960	3558,066351	54568	0,219905
40-60	228	737	50	11400	1063,279621	4958,6	0,216114
60-80	96	833	70	6720	2367,696682	58396	0,090995
80-100	222	1055	90	19980	9915,298578	442852	0,210427
	1055	x	x	47830	26692,54976	906656	1

MEDIAN

$\tilde{x}=a_{\tilde{x}}+h_{\tilde{x}}*(r-N_{(\tilde{x}-1)})/n_{\tilde{x}}$
r=k/α*n → r (med)=(1/2)*n = (1/2)*1055 = 527.50
$\tilde{x}=a_{\tilde{x}}+h_{\tilde{x}}*(r-N_{(\tilde{x}-1)})/n_{\tilde{x}}$ = 40+20*((527.5-509)/228) = 45.336

Half of the students have 45.34 points or less and half of the students have 45.34 points or more.

QUARTILES (Q1, Q3)

Quartile: $\tilde{x}=a_{\tilde{x}}+h_{\tilde{x}}*(r-N_{(\tilde{x}-1)})/n_{\tilde{x}}$
r1 =k/α*n → r=(1/4)*n = (1/4)*1055 = 263.75
r3 =k/α*n → r=(3/4)*n= (3/4)*1055 = 791.25
Q1 = $a_{\tilde{x}}+h_{\tilde{x}}*(r-N_{(\tilde{x}-1)})/n_{\tilde{x}}$ = 20+20*((263.75-277)/232) = 18.857

Q3 = a_$\tilde{x}$ +h_$\tilde{x}$ *(r-N_($\tilde{x}$-1))/n_$\tilde{x}$ = 60+20*((791.25-737)/96) = 71.302

Lower quartile (Q1) = 25% of students have 18.86 points or less and 75% of students have 18.86 points or more. Upper quartile (Q3) = 75% of students have 71.30 points or less and 25% of students have 71.30 points or more.

AVERAGE ABSOLUTE DEVIATION

$\bar{d} = \frac{1}{n} * \sum|x_i' - \bar{x}| * n_i$

$\bar{d}$= (1/1055)* 26692,54976 = 25,301

The scores of individual students differ from the mean value by an average of 25.30 points.

STANDARD DEVIATION

$S^2 = \left(\frac{1}{n}\right) * \sum(x_i' - \bar{x})^2 * n_i$

s = $\sqrt{(s^2)}$

S^2=(1/1055)* 906655,545 = 859,389

s = $\sqrt{(s^2)}$ = $\sqrt{(859{,}389)}$ = 29,315

The scores of students during the full-time course differ on average by 29.31 points.

BOXPLOT

	Med.	Diff.
Q0 (Min.)	0	0
Q1	18,85776	18,85776
Q2 (Med.)	41,62281	22,76505
Q3	71,30208	29,67928
Q4 (Max.)	100	28,69792

- **Minimum (Q_0)** represents the lowest data point in the data set excluding any outliers
- **Maximum (Q_4)** represents the highest data point in the data set excluding any outliers
- **The Median (Q_2)** represents the middle value in the data set
- **The upper quartile (Q_1)**: is the median of the upper half of the dataset
- **The lower quartile (Q_3)**: is the median of the lower half of the dataset
- **Interquartile range (IQR)** is the distance between the upper and lower quartiles

$\mathbf{r_1} = \frac{k}{\alpha} * n \rightarrow r = \left(\frac{1}{4}\right) * n$ = (1/4)*1283 = 320,75

$r_3 = \frac{k}{\alpha} * n \rightarrow r = \left(\frac{3}{4}\right) * n =$ ***(3/4)*1283 =*** 962,25

$r\ (med) = \left(\frac{1}{2}\right) * n$ = (1/2)*1283 = 641,5

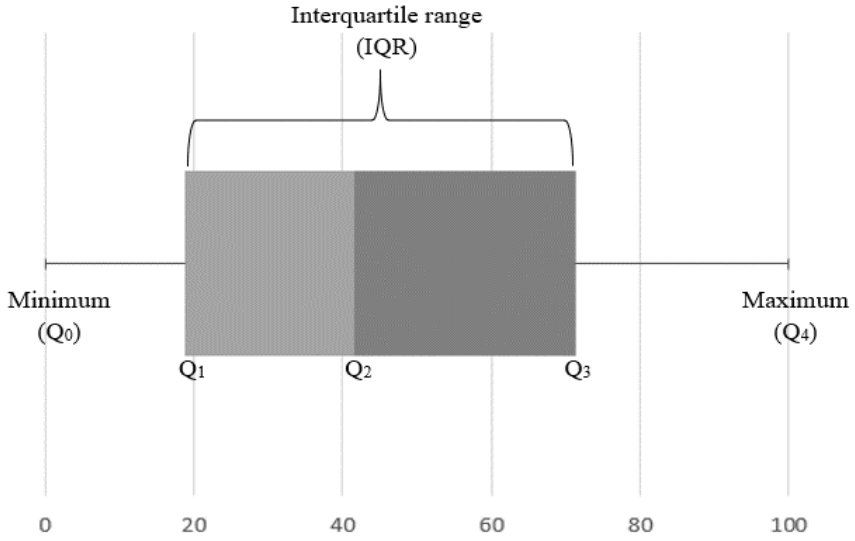
Q_0 (Min.) = 0

$Q1 = a_{\tilde{x}} + h_{\tilde{x}} * \frac{r - N_{\tilde{x}-1}}{n_{\tilde{x}}}$ = 20+20*((263,75-277)/232) = 18,857

Q_2 = Med (x) = $a_{\tilde{x}} + h_{\tilde{x}} * \frac{r - N_{\tilde{x}-1}}{n_{\tilde{x}}}$ = 40+20*((527,5-509)/228) = 45,336

$Q3 = a_{\tilde{x}} + h_{\tilde{x}} * \frac{r - N_{\tilde{x}-1}}{n_{\tilde{x}}}$ = 60+20*((791,25-737)/96) = 71,302

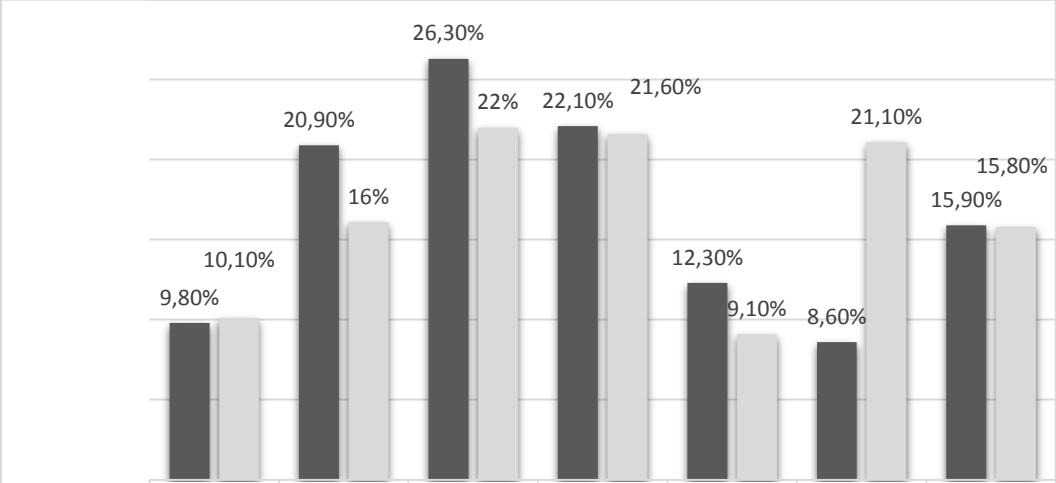
Q_4 (Max.) = 100



In both the online and on-site testing, the average student grade is a D. The difference is in the average number of points students scored. Surprisingly, in the on-site testing, students scored an average of 3.35 more. There are differences in other parameters as well. The standard deviation of the number of points scored by students who took the test in person is 23.28. The standard deviation of the number of points scored by students who took the test online is 22.98.

Bar graph 1 shows grades achieved in online and on-site testing in percentage. The graph shows that the FX scores are significantly higher in the on-site testing when students were physically at the university than in the online testing. The difference is 12.5 percent. We hypothesize that this negative trend resulted from the change in the testing environment.

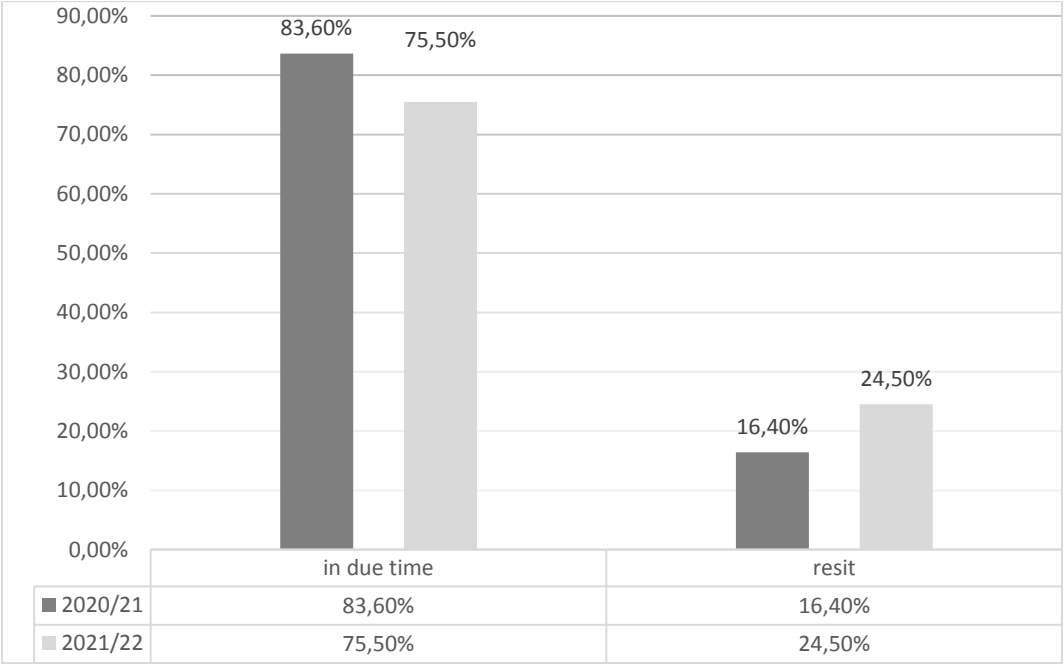
Figure 1. Comparison of results in %



	A	B	C	D	E	FX	X
2020/21	9,80%	20,90%	26,30%	22,10%	12,30%	8,60%	15,90%
2021/22	10,10%	16%	22%	21,60%	9,10%	21,10%	15,80%

In bar graph 2 we see a comparison of the number of students who passed the test in due time with the number of students who had to resit the test. The result, given the scores that students received, is not surprising. The students who took the online test at home performed better. 83,6% of the students who sat for the exam were successful and passed the test and only 16,4% of the students had to resit the test. However, only 75,5% of the students who took the exam on-site passed the test in due time and 24,5% of the students had to resit the test.

Figure 2. Examination in the due period versus resit



	in due time	resit
2020/21	83,60%	16,40%
2021/22	75,50%	24,50%

4. DISCUSSION

The research was conducted during the academic years 2020/2021 and 2021/2022. The aim of the research was the impact of online education on on-site education. We used quantitative data analysis methods in the research.

Based on the analysis of the results of online and on-site testing, we confirmed hypothesis H0: We established H0 (null hypothesis): Students will achieve better results when they take the e-test via Moodle platform in the home environment and we refuted the hypothesis H1 (alternative hypothesis): Students will perform better results when they take the e-test via Moodle platform on-site at the university.

The results confirmed that students who took the test in the home environment performed significantly better than students who took the test in person at the university. We see this not only in the grades that students achieved but also in the number of students who had to resit the test. Only 16.4% of the students who took the test in the home environment had to take the test again, as opposed to the 24,5% of students who took the test on-site and had to resit the test.

Bachman (1997) believes that the following four factors determine test performance: candidates' language ability, testing methods, personal characteristics, and random factors. We agree with this assertion. Students' language skills have a major influence on their scores, but they are influenced by the aforementioned factors. In our case, random factors played a major role. They arose from the situation we were all in due to the COVID-19 pandemic. The students participated in online instruction from February 2020 until March 2022. Both the instruction and the testing were conducted entirely in the home environment. The home environment can have a positive impact on the student in the sense that they are in a familiar environment, and the student does not have to rush anywhere to take part in the educational process. The disadvantage of the home environment is that students were often engaged in other activities during seminars and lectures. They often turned off their cameras, reasoning that they had a problem with their internet connection, their camera was not working, their microphone was not working, or they were just logged in but they were somewhere else. These factors legitimately affected the quality and level of the educational process. Teachers were demotivated, frustrated, and affected by this situation. They often complained that they felt they were talking to themselves because the students did not respond to questions. This situation was also influenced by the technology available to the participants. For example, the platform MS Teams offers a limited number of students that can be seen on the screen. At the beginning of the pandemic, it was 9 students. At the end of the pandemic, Microsoft expanded the number from 9 to 49.

In mid-March 2022, students at the University of Economics returned to the university. The educational process continued on-site. The examination was conducted after 2 years on-site too. This was a big change for the first-year students. Not every student could handle this situation. We assume that a number of students cheated during the examination period in the winter semester, despite the lecturers' efforts to limit possible cheating attempts, which was

reflected in the relatively low number of students who failed the examination. In the summer semester, students had to write tests on-site and this was reflected in the result. As we already mentioned, 21,10% of students did not pass the test.

We have to agree with researchers who argue that formative assessment is preferable to summative assessment in online learning. This is because, with summative assessment, it is very difficult to ensure that students do not cheat during a test in the online space. The results of our research confirm this view. This was reflected in the number of students who failed the test they took on-site.

We hypothesize that students will gradually develop study habits that they have lost in online learning. These changes in study habits should help improve the learning process. In traditional classroom teaching, we should continue to use information and communication technologies to improve the learning process and increase student motivation.

5. CONCLUSIONS

In this paper, we have examined the results of testing in two different environments. In the first case, it was testing the language skills of students of the University of Economics in Bratislava who studied online during the academic year 2020/2021. The testing of the student's knowledge of professional English took place in an online environment. The students were at home during the lessons. In the second case, the instruction that preceded the testing was conducted from March on-site, i.e. the students attended the class in person.

The question is to what extent the education system has been affected by the pandemic. We had students in primary school, secondary school, and at universities who had taken part in education from home for 2 years. Students' educational habits have changed. They did not have to get up in the morning, get dressed, and go to school. They often made excuses for non-functioning devices so that they did not have to be active in class. The quality of the educational process has declined despite the best efforts of teachers. This has been reflected in the results they achieved in on-site testing.

Today, we do not know when we will be able to reverse this negative trend in the decline in the quality of education. It is very important that the learning process will continue on-site so that students can re-establish proper study habits. This does not mean that we should not use technology. On the contrary, technology should become part of the learning process. Today, we can teach from home and every teacher is aware of the benefits of communication technologies. We should continue to use technology as a supplement to traditional classroom teaching.

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