

Article

Digital University: A Study of Students' Experiences and Expectations in the Post-COVID Era

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Abstract: In 2020, the education process at universities started to be redefined, parting with the traditional face-to-face form. The article presents the conclusions of exploratory study conducted at the Jagiellonian University in Kraków (Poland) on the students' experiences of remote education as well as their expectations for the future. The study was conducted in the form of an online survey addressed to the entire population of science recipients at the Jagiellonian University, around 800 respondents completed the questionnaire. The obtained results show that most students rate remote education relatively high, although there are statistically significant differences in specific questions (e.g., theoretical classes are more suitable for online learning than practical classes). The authors paid special attention to the differences in the attitudes of students depending on their characteristics, the approach to remote education differs, in particular, depending on the gender and field of study. Students of social and humanist faculties view remote education most positively, and science students opinions are mostly negative. It has also been observed that some students are uncritically satisfied with most aspects of distance learning (the so-called "Tiggers"), while others are strong supporters of face-to-face education, reluctant to accept any changes (so-called "Eeyores"), so regardless of the scope of pro-quality activities undertaken, both criticism and praise of remote education can be expected. The obtained results open the field for further studies that would allow to confirm the covariance of multidimensional characteristics of students and their attitudes towards the digital university, and on the other hand would allow planning activities aimed at different and perhaps mutually contradictory expectations of the recipients of education.

Keywords: digital university; online learning; perception of remote education



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1. Introduction

You never let a serious crisis go to waste. Furthermore, what I mean by that it's an opportunity to do things you think you could not do before. Rahm Emanuel [1]

In the old days, applications for student dormitories were submitted on paper. Then, in front of the university offices at 6 am on frosty winter mornings, queues were formed to sign up for classes, and after the exams, students played a field game to get all professors' signatures certifying their exam grades. Still, even before 2020, quite a lot of university matters could already be dealt with remotely. Some processes could be moved towards digital future faster, others slower. Many habits of students and employees seemed impossible to overcome and digitization was simply a transfer of procedures from the real world to the virtual space on one-to-one basis. Then, March 2020 came and it suddenly turned out that even the rector (chancellor) of a six-hundred-year-old university can be elected through the IT system.

The study was conducted two years after the global pandemic was declared. The future was not yet known—whether remote teaching would be a necessity or a possibility in years to come. Carrying out similar studies in different countries, at a different universities but in the same moment and in the same pandemic context seemed an interesting and valued task in the face of future education, regardless of the situation with COVID-19. Certainly, not all experiences of the pandemic period need to be revisited, but for sure many solutions have proved to be successful and should be maintained in the post-pandemic realm. This reasoning initiated the exchange of experiences between students and employees of the Jagiellonian University in Kraków and Université Paris 1—Panthéon-Sorbonne.

In the spring of 2022, a group of students and employees of the Jagiellonian University in Kraków gathered to reflect on what these two years had taught them and what inspiration they brought for the future. The team undertook to create a survey addressed to students and doctoral students, which would allow to better understand their perception of changes taking place at the university. The questions were supposed to concern what a “digitized university” means for the students and how they imagine its future, not focusing on the evaluation of the classes itself, but rather on such aspects as experienced ailments, contacts with other students and household members, or ideas about the future of the university. Gradually, questions were selected and, using the survey system existing at the Jagiellonian University, they were combined into the questionnaire. After the tests, an invitation to take part in the survey was sent to all students of the university.

In this paper, the authors summarize the results of the study and reflect on the conclusions for the future. Hoping that another pandemic would not hit the world for some time, the authors think, as in quote above, that one should not waste the opportunity, but rather treat it as a starting point for changes for the better. At least at the university level.

2. Research Justification

Along with the popularization of distance learning, it has become important to define the desired direction of change in academic education. The pace of this process was particularly rapid as a result of the forced changes in the daily functioning of societies, introduced by their governments in connection with the declared pandemic. Prepared or not, various institutions, including universities, had to implement new digital solutions overnight. Thus, publications and studies on digital universities and distance education created before 2020 have acquired very practical importance, while at the same time providing the basis for more recent research.

Numerous publications and research provided many valuable suggestions, although the specificity of the issue, strongly related to the rapid changes in the technical sphere and the local characteristics of the university, prompts to pose new research questions. The multifaceted nature of the term “digital university” [2,3], research on factors influencing online learning outcomes [4,5], new ethical challenges [6], meta-analysis of data from several years [7], cross-county studies of perceptions on distance education [8] are just a few examples of publications expanding knowledge about digital university and remote learning. Focusing on the changes that took place in the last two years during the “emergency remote education” [9], the authors do not discuss the extensive achievements of the research carried out in previous years, but it should be emphasized that this does not diminish their importance in shaping the framework of the current studies.

For obvious reasons, after 2020, COVID-19 has become the context for research conducted by teams of scientists at many universities. The scale and importance of the observed changes in the approach to broadly understood education are emphasized by attempts to call the phenomenon, perhaps somewhat exaggerated, the “Great Online Transition” [10]. Numerous studies cover a wide range of issues, incl. educational management [11], technological factors of distance learning [12], teaching resources and methodologies [13], online learning effectiveness [14], learning achievements and motivation [15], socioeconomic situation of students [16]. Not all conclusions formulated in publications should be generalized to other levels of education than those on which the study was conducted, as these popula-

tions differ in organizational conditions, the content of education and the characteristics of the actors. For this reason, when planning this study, attention was focused mainly to the literature on academic education, which, although less numerous, allows to avoid inference errors resulting from the specificity of the studied subject.

According to the authors, it is too early to perform a meta-analysis of the results, although attempts to conduct comparative analyzes deserve attention. A cross-sectional study of a large sample of students from 62 countries provided valuable data on the impact of the first wave of COVID-19 on various aspects of students' lives, including socio-demographic factors as important predictors of their perceptions [17]. The authors of another study from three geographically distant universities highlight some positive effects of the pandemic, seeing the future of higher education in more flexible, hybrid learning modes [18]. Another comparative study, also conducted at three distant universities, took Hofstede's Cultural Dimensions Theory as a starting point to explain the different perceptions and attitudes of students' experiences of the "emergency online learning" [19]. Three other universities were compared focusing on the assessment of ensuring the development of digital literacy as a key point in new learning scenarios [20]. A slightly different approach to comparing digital skills presents the results of the internal evaluation of the remote study process in the context of external statistics such as the Digital Economy and Society Index [21]. Another comparative aspect was used in the study which considered psychological factors—student motivation, self-efficacy and anxiety—as key factors in their engagement and online learning performance [22].

A number of publications dealt with a problem similar to the subject of the present study, that is, the perception of distance learning among students. Some of the results showed that online education is less effective than traditional classes [23]. A similar conclusion is confirmed with varying intensity depending on the specificity of the university and the type of classes, the perception of online learning may also be influenced by the student's gender [24]. The way of conducting online classes is also important, synchronous modes are more satisfying and motivating for students than asynchronous ones [25]. A certain degree of responsibility for the way students perceive remote classes rests with the university, which must develop optimal ways of dealing with the transition to online or blended learning [26,27]. The preferences of students with special needs were also examined, obtaining inconclusive results, preferences of online or face-to-face learning are individual and determined by the nature of the disability [28]. An additional dimension is time, in 2022 a much higher percentage of students preferred online classes than in 2020 [29]. It is worth noting that most studies of this type did not attempt to categorize participants or were limited to one-dimensional categorization, which leaves cognitive gaps that deserve recognition. On the other hand, formulating general conclusions may facilitate future meta-analyses of research material collected by many authors.

At the Jagiellonian University level, on a local scale, two university-wide studies had been carried out, the aim of one of them was to assess the level of student satisfaction with remote classes, the other focused on determining the quality indicators of distance learning. The current study fills the remaining gap, revealing students' experiences and expectations regarding the ongoing digitization. The goal of this paper, however, is not only to explore their perceptions of changes taking place at the university, but also to explain the sources of similarities and differences in expectations towards digital university formulated by individuals.

3. Research Questions and Methodology

The study was planned and carried out by a working team composed of employees of the Jagiellonian University in Krakow responsible for the implementation of the tasks provided for in the OpenU project and students of various faculties of the university, actively involved in the activities of the student government. Initial brainstorming and literature analysis became the basis for formulating the following research questions:

- Did students who learned remotely from the beginning perceive remote learning differently than their older colleagues who had already experienced classroom learning?
- Is there a relationship between the gender of students and their perception of remote learning?
- Do students of different faculties perceive remote learning in the same way?
- What problems (physical and mental) do students complain about in relation to remote learning?
- Were the academic teachers well prepared for classes in a modified form, were they able to adapt?
- How do students, after two years of distance learning, perceive the idea of a digital university? Do they allow such functioning on a permanent basis?
- How accurate, according to students, are the organizational solutions supporting remote learning?

Due to the exploratory nature of the study, the working team decided to conduct a study using an online survey as a tool to learn about the views of a wide range of respondents. During the survey review, several meetings were held between students and employees of the Jagiellonian University in Kraków and Université Paris 1—Panthéon-Sorbonne. The numerous questions initially proposed, which would reveal how students perceive different aspects of the digital university, have been reduced and grouped into four blocks:

1. perception of distance learning (subjective distant learning experiences in terms of equipment, organization and health);
2. perception of digitization of administrative matters (in terms of technical and substantive solutions);
3. perception of the impact of distance learning on the comfort of studying (the pros and cons of online learning);
4. opinions on the use of new forms of teaching in distance learning.

In addition, basic data—gender, age, field of study and year of study—of the participants was collected in the questionnaire to identify the user groups.

The survey has been conducted from 21 June to 10 July 2022 using an anonymous online service, available to all active students of the Jagiellonian University in Kraków. The platform of choice was “Ankieter” (“Pollster”), which allows for voluntary participation of respondents from among eligible persons. The questionnaire was addressed to the entire population of learning recipients at the Jagiellonian University, including students, doctoral students and participants of other forms of education, as of 20 June 2022 (people who graduated before that date were excluded from the study).

The questionnaire was completed by 753 out of 38,305 people, so the obtained response rate was about 2%. This sample allows to achieve the exploratory objective, however, its size and method of selection are not sufficient to formulate confirmatory conclusions. The collected data was statistically analyzed using SPSS Statistics and MS Excel.

The results are interpreted and presented in aggregated form only, with absolute ethical and practical care for the personal interests of the participants: only anonymous data provided voluntarily by participants was used in the study; the participants entered the study voluntarily and were informed about its purpose, their behavior was not influenced in any way; the subject of the study does not include controversial issues that would require special sensitivity; the course of the study was not physically or mentally exhausting for the participants and it was possible to withdraw at any time.

4. Results

4.1. Characteristics of the Sample

Almost 65% of respondents were female, 34% male and remaining 1% identified themselves as other or choose not to disclose that information. More than half (52.3%) of the survey participants are undergraduate students, slightly less (40.5%) are graduate students.

PhD students constitute 7.2% of the respondents. The proportions of undergraduate and graduate students are inverted to the proportion in the population, where over 50% are graduate students. Over 80% of the respondents are participants of full-time studies, the proportions obtained are close to the proportions in the population. Almost half of the respondents are first-year students, their percentage is slightly higher than the percentage of first-year students in the population (see Table 1).

Table 1. Demographics of the survey. The studied group was consistent with the distribution of the population in terms of gender, study type, similar in terms of the study level, while an overrepresentation of younger students (born in 2001 and later) can be observed.

		Sample	Population
Gender	Female	65.6%	67.1%
	Male	34.4%	32.9%
Study level	Bachelor	52.3%	37.1%
	Master	40.5%	46.3%
	PhD	7.2%	4.8%
	Other	0,0%	11.9%
Study type	full-time	82.8%	80.6%
	half-time	17.2%	19.4%
Year of study	1	47.7%	55.1%
	2	27.1%	26.9%
	3	12.2%	4.6%
	4	7.3%	12.0%
	5	5.1%	1.1%
	6	0.5%	0.4%
Born in 2001 and later		40.0%	25.5%

Due to the COVID-19 restrictions introduced in 2020, people studying for the first time in the 2020/21 and 2021/22 cycles had the opportunity to experience remote forms of education implemented throughout the University. Based on a typical education scenario, it was assumed that for the people born in 2001 and later (40% of respondents) it was their first encounter with university education, therefore they may have different experiences than those who studied in the previous years.

The study program declared by the respondents (see Figure 1) was reduced to the main field. The specificity of education in individual fields may diversify the experiences related to education in the stationary and remote form. The largest percentage of respondents (50%) study in the field of social sciences (see Table 2).

Table 2. Composition of the respondent groups. Most of the participants study in the field of social sciences.

Field of Study	Sample
Social studies	50%
Science	26.7%
Humanities	16.8%
Health Studies and Medicine	6.5%

A fourth of the respondents are involved in the activities of various types of student organizations. There are no data on such involvement for the entire population.

4.2. Perception of Distance Learning

Most respondents declared that both their equipment and the internet connection are sufficient for remote learning. Less than 10% of respondents indicated difficulties resulting from poor efficiency of the internet connection.

In the multiple-choice question, the respondents were asked to indicate ailments they have experienced in connection with remote learning. About 43% of respondents did not experience any symptoms, and among the remaining people the most frequently mentioned ailment was eye fatigue. Based on the answers provided, two main components were distinguished (see Table 3):

1. physical complaints (neck pain, back pain, headache, eye fatigue, visual impairment),
2. mental ailments (problems with sleep, loss of energy, worsened mood, loss of motivation, loss of interest, stress, apathy, weight fluctuations).

Table 3. Most of the students had some sort of physical or mental health problem. Among them most have complained about both. However, it should be noted that over 40% did not report any complaints.

Field of Study	Sample
No ailment	42.7%
Physical ailments	12.5%
Mental ailments	10.1%
Mental & physical ailments	34.7%

According to this division, the responses were reduced to one variable, the distribution of which is presented below. Over third of the respondents experienced both physical and mental ailments (see Table 3).

It is worth mentioning that there is a linear relationship between the number of ailments indicated by the students and the answers to most of the survey questions, the more ailments indicated, the more critical is the perception of distance learning overall (see Figure 2).

Remote learning allowed students to save time on commuting (95%). They were used to the web space and it was easy for them to find their place in it (88%). The students did not lack the knowledge and skills to use the tools used in distance learning (92%), they also had adequate space to study at home (86%). Remote learning allowed students to manage their time more flexibly (83%) and the vast majority had no problems with access to necessary sources such as libraries or reading rooms (79%). However, for almost half of the respondents (49%) it was a problem to stay focused on classes.

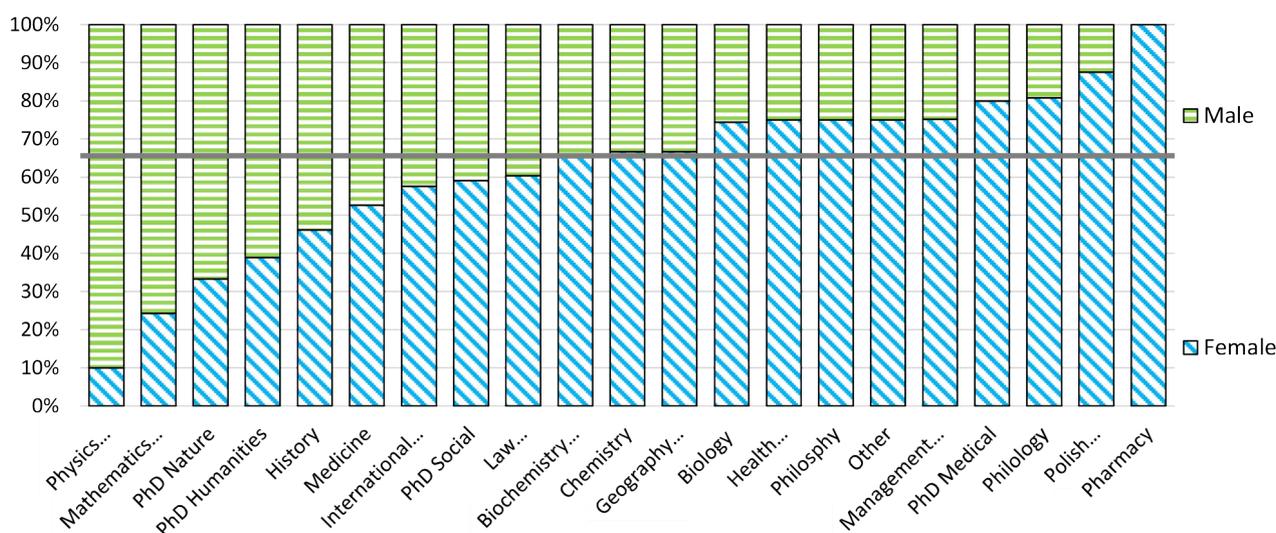


Figure 1. Distribution of gender of respondents in faculties. The horizontal line serves as a benchmark showing the gender proportions across the sample.

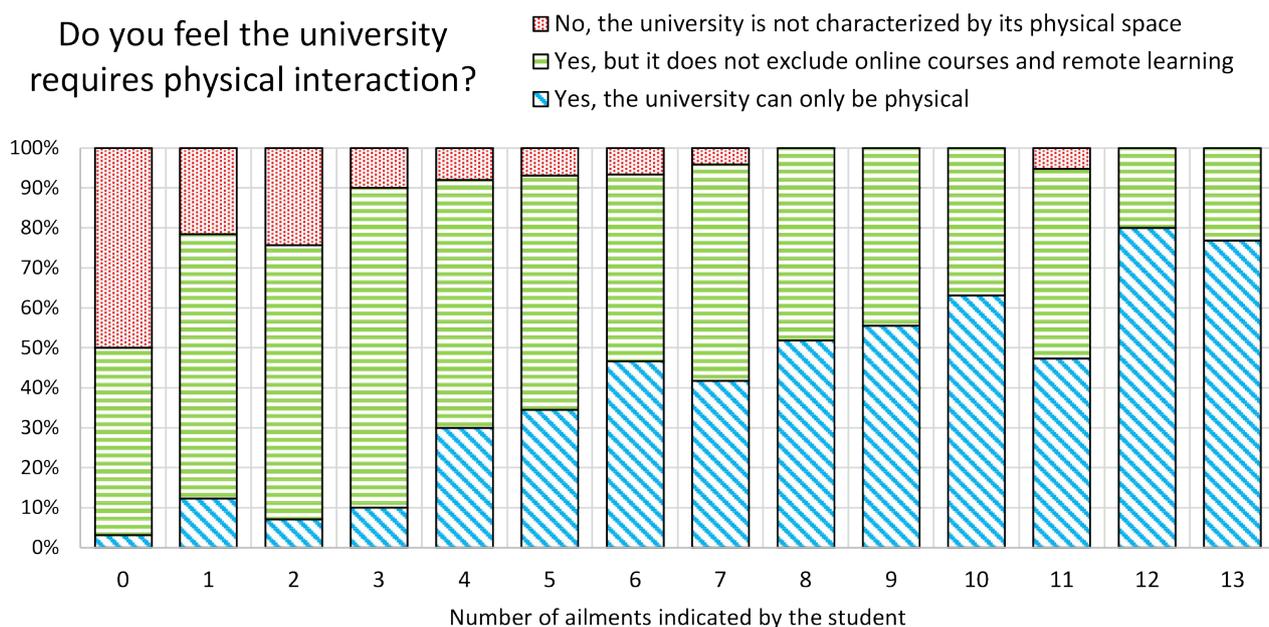


Figure 2. Perception of the university in groups with different numbers of ailments.

There is a noteworthy statistically significant relationship ($\chi^2 = 104.626$; $p < 0.001$) between difficulties with maintaining attention during remote classes and the teachers' proficiency with digital tools during online learning. Students who did not experience difficulties with concentration rate their lecturers higher than students who experienced such difficulties. The reasons for this may lie on both sides - in the inadequate preparation of online classes as well as in the inappropriate attitude of students to the classes in which they participate. Additionally, Figure 3 shows the differentiation of answers to both questions by gender and field of study.

Students had different opinions about preferred mode of conducting classes depending on their type (lecture, exercises, laboratories, etc.). According to the majority of respondents, the online form is suitable for theoretical classes, in particular lectures (75%). In contrast, distance learning is not desirable for practical activities, in particular labs (13%) and apprenticeships (16%).

Most students do not mind recording the class (81%) and believe that most of the lecturers were good or very good with digital communication tools (80%). In the latter case, the responses were correlated with the students' physical and mental well-being.

4.3. Digitization of Administrative Matters

The vast majority (71.4%) of the respondents positively assess their experiences with the use of digital platforms of the Jagiellonian University, while 3.2% declare their experiences clearly negative.

The results of the survey show that the vast majority of students highly appreciated the possibility of dealing with various matters remotely. This applies in particular to student applications (84% assessed the process as good or very good), filling out various forms (83%) and receiving scholarship decisions (90%). The assessment of registration for classes, despite the relatively high overall grade (75%), differed significantly depending on the field of study.

An open question was also asked about matters that the students would like to settle remotely. The most frequent answers include conducting examinations and remote defense of the thesis, the possibility of submitting and receiving documents, and the possibility of using library resources. In nine statements, the respondents emphasized the need for the university to provide the possibility of using traditional solutions, regardless of the degree of digitization.

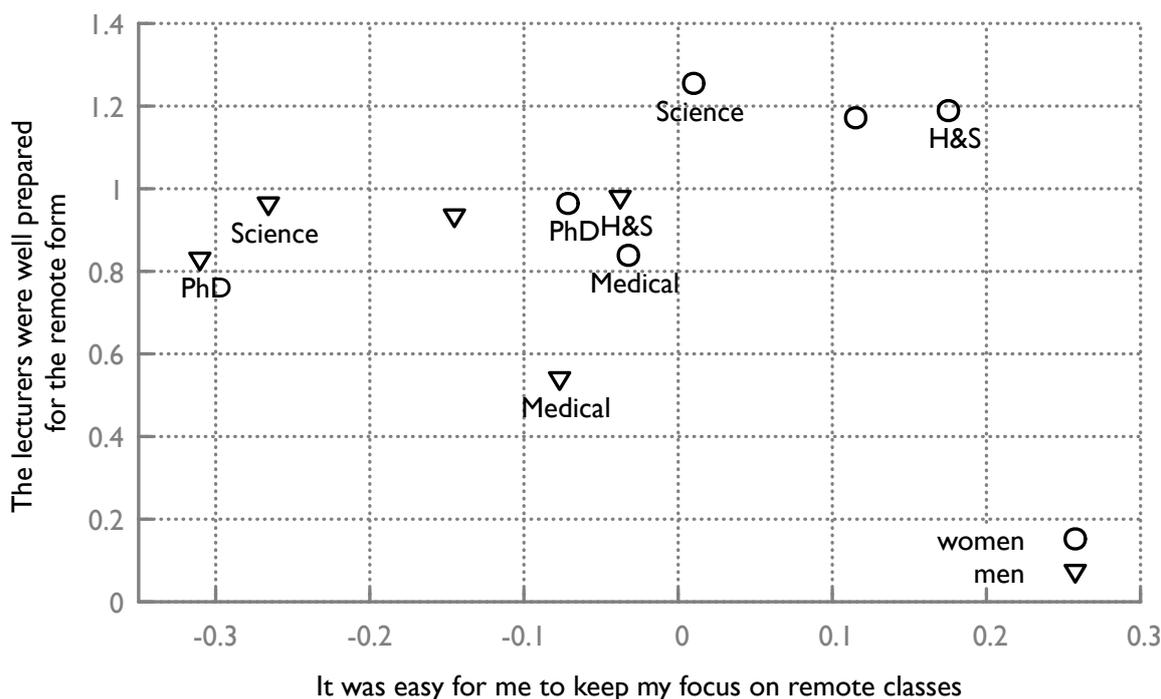


Figure 3. Position of gender and learning discipline in a two-dimensional space built on the preparation of teachers for distance learning (according to respondents) and the ability of students to focus on remote classes. Both aspects are rated slightly higher by women than by men. H&S → Humanities and Social Studies.

4.4. Distance Learning and the Comfort of Studying

According to 19% of respondents, a university is a place that requires physical interaction, while according to 27% physical interaction is not necessary. The vast majority believe that both forms of interaction are equally needed.

The respondents also assessed the impact of the study mode on the possibility of self-expression in the student space. Taking up various types of activities outside the classroom was easier offline for almost half of the respondents (42%), for one third it was easier online (27%). The remaining respondents did not notice any effect of the learning mode on the ability to express themselves.

Students identified their beliefs about the positive impact of online learning on various aspects of their lives. They are most positive about progressing at school (71%), they also highly rate (over 60%) the impact of online learning on the developing of knowledge, skills and passions. On the other hand, almost half of the respondents are not convinced of the positive impact of online learning on motivation to study and their health.

Respondents assessed the impact of online learning on maintaining relationships with other students rather negatively, around 60% of them believe that it is more difficult than in the traditional learning model. Almost half of them also indicate difficulties in establishing new relationships and integrating with others.

In search of answers to the questions about the relationship between the perception of remote learning and the gender of students and the field of study, a series of chi square tests were performed, which revealed significant dependencies with the distribution of answers to detailed questions. However, due to the contingency of gender and faculty (see Figure 1), despite the fact that it causes some interpretation difficulties, it was decided to consider these variables together as co-creating relations with other distributions. The most interesting associations between the variables are illustrated using the Multiple Correspondence Analysis which, based on the geometric distances between respondents' characteristics, presents the position of variables in a two-dimensional plane (see Figures 4–6).

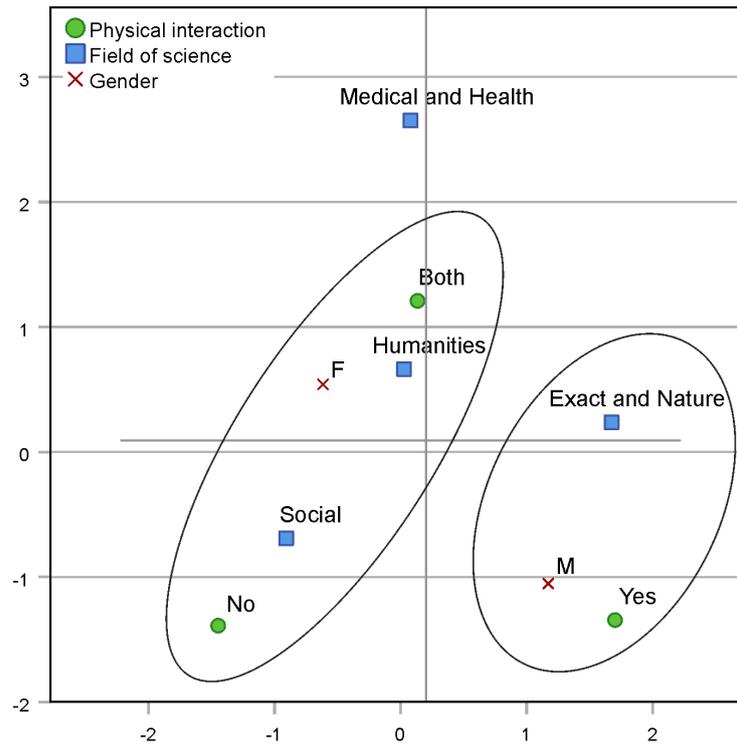


Figure 4. Associations between gender, field of study, and ideas about the essence of the university. It shows two clusters: 1. the neighborhood of females, social and humanities sciences and the university open for non-physical form (in Q2 and Q3) and 2. the neighborhood of males, exact and nature sciences and the university as a physical space mainly (in Q1 and Q4).

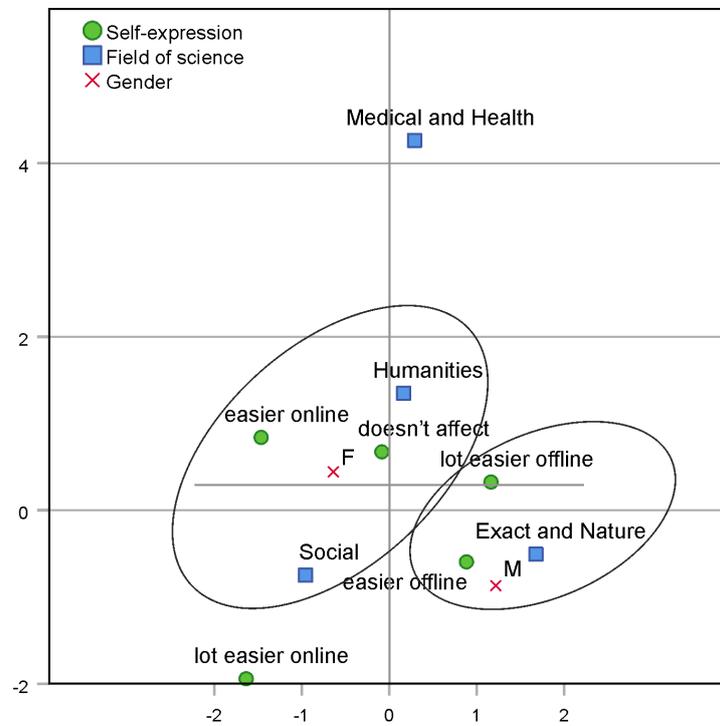


Figure 5. Associations between gender, field of study, and possibility to express yourself in student space affected by the study mode. It shows two clusters: 1. the neighborhood of females, social and humanities sciences and “does not affect or easier online” (in Q2 and Q3) and 2. the neighborhood of males, exact and nature sciences and “easier offline” (in Q1 and Q4).

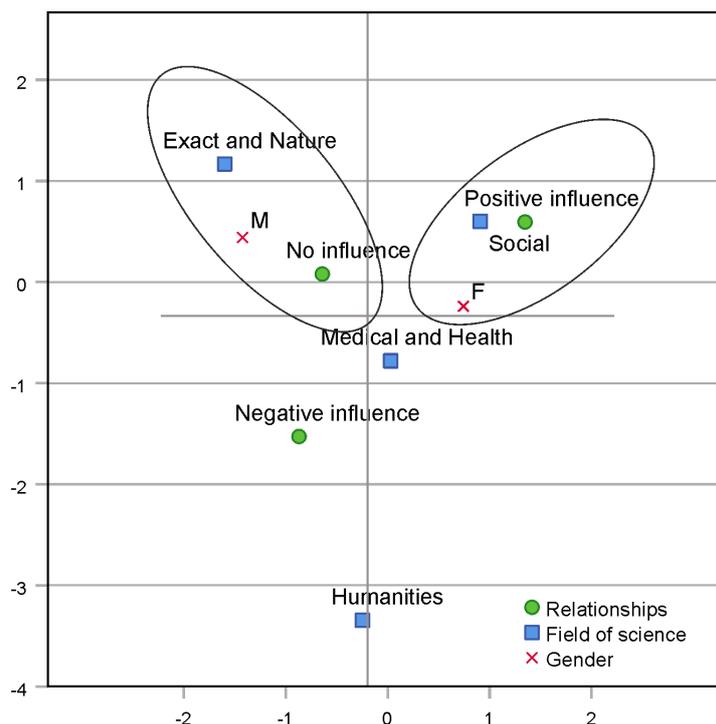


Figure 6. Associations between gender, field of study, and and perceived impact of online learning on relationship with others. It shows two clusters: 1. the neighborhood of females, social sciences and a positive impact on relationships (in Q1) and 2. the neighborhood of males, exact and nature sciences and no influence on relationships (in Q2).

The observed dependencies allow us to conclude that there are clear differences in the perception of the digital university between different groups of students. Women who dominate in terms of proportions in social studies are significantly more favorable to remote solutions than men who dominate in terms of proportions in exact studies, such a tendency is visible in relation to various aspects mentioned in the questionnaire. The above-mentioned interpretation difficulties concern the decision whether the main criterion differentiating the answers is gender or the specificity of the field of study, it changes depending on the analyzed question.

Contrary to assumptions, no statistically significant differences were found in the perception of distance learning between students who learned remotely from the beginning (40%) and their older colleagues who already had experience of learning in the classroom (60%). Previous experiences do not affect the evaluation of remote learning solutions implemented by the university.

4.5. New Forms of Teaching in Distance Learning

The forms of remote learning most desired by students are discussions and quizzes (see Table 4). Surprisingly, the expected differences in responses resulting from the specificity of the study turned out to be statistically significant only for less than half of questioned activities. Discussions are slightly more popular in humanities, project-oriented learning are slightly more popular in social sciences, teamwork is a bit less popular in exact and nature studies. Among other forms of activity suggested by the respondents there were—among others—use of presentations, instructional videos and interactive manuals, real-time VR meetings, solving tasks using specialized open source software.

Table 4. Activities expected during remote classes in total and by fields of study. Symbol (*) denotes statistically significant differences between fields of science (χ^2 test; $p < 0.01$).

Type of Activity	Total	Exact and Nature	Medical and Health	Humanities	Social
Discussions *	66.5%	63.3%	63.3%	80.0%	64.4%
Quizzes	61.3%	60.3%	67.3%	58.5%	62.0%
Project-oriented learning *	46.4%	43.2%	24.5%	36.0%	54.0%
Brainstorms	42.8%	35.7%	42.9%	50.4%	43.9%
Teamwork *	41.1%	32.2%	40.8%	38.4%	46.5%
Writing tasks	30.4%	22.6%	22.4%	35.2%	34.0%
Other	2.9%	4.0%	4.1%	3.2%	2.1%

Blended learning, understood as a mixed form, in which some activities take place online and some face to face at the university, was experienced by 60.6% of respondents, of which 58.5% think that blended learning would facilitate learning.

If they had such a possibility, 81.8% of the respondents would like to be able to choose whether they want to participate in the classes remotely or in person. 75.8% of respondents are interested in participating in online courses organized by various European universities.

4.6. “Tiggers” and “Eeyores”

The average is relatively often a misleading indicator of what is observed. In a highly polarized value of the respondent group, the average will be in the middle, where there is really no one. Nevertheless, it is worth using this measure to understand the extremes.

In this study, based on the Chi-square automatic interaction detection (CHAID) [30] technique with an overall perception of distance learning as a dependent variable, we can designate two groups of users, which constitute more than half of all respondents. The first group consists of female students complaining of no more than 3 ailments (the so-called “Tiggers”), the second group includes male students who report 4 or more mental or physical ailments (the so-called “Eeyores”).

As can be seen in Table 5, “Tiggers” are satisfied with distance learning, see its benefits mainly, are definitely very positive about the form of remote lectures, language courses, etc. They also rate the competences of the teachers higher. On the other hand, the second group is pessimistic about distance learning, assesses the lecturers worse, and finally believes that the university is a physical place and so it should remain. Their attitude to basically all aspects of digital education is negative, hence the name — “Eeyores”.

Table 5. “Tiggers” and “Eeyores” of remote learning. A significant deviation from the mean is marked with an *italic* (for a lower value) or a **bold** (for a higher value).

Question	Scale	“Tigger” (N = 363)	“Eeyore” (N = 70)	All (N = 741)
How would you rate your Internet connection during online learning?	1–3	1.04 ± 0.010	1.26 ± 0.056	1.11 ± 0.012
Does online learning experience influence your relationship with people you live with?	1–3	1.97 ± 0.054	2.25 ± 0.077	2.14 ± 0.035
Online learning allowed me to save time commuting.	0–1	0.98 ± 0.007	0.84 ± 0.044	0.95 ± 0.008
I expanded my IT knowledge.	0–1	0.87 ± 0.018	<i>0.40 ± 0.059</i>	0.71 ± 0.017
Online learning allowed me for better studying/working time management.	0–1	0.96 ± 0.010	<i>0.49 ± 0.060</i>	0.83 ± 0.014
I had difficulties with maintaining attention during remote classes.	0–1	<i>0.27 ± 0.023</i>	0.91 ± 0.034	0.49 ± 0.018
Which statement best reflects your opinion regarding digital platforms that were used during online learning (such as MS Teams, Pegaz, e-mail)?	1–4 ^a	<i>1.19 ± 0.028</i>	2.01 ± 0.123	1.47 ± 0.030
It was easier for the teacher to monitor my progress during online learning than during traditional learning.	0–1	0.73 ± 0.023	<i>0.11 ± 0.038</i>	0.55 ± 0.018
I find it easy to navigate on the Internet.	0–1	0.95 ± 0.011	0.70 ± 0.055	0.88 ± 0.012
I did not have the opportunity to attend labs or practical classes (e.g., classes that required usage of professional equipment. access to specialized software. clinical classes)	0–1	0.18 ± 0.020	0.57 ± 0.060	0.28 ± 0.017
The amount of time required for preparation for remote classes was significantly larger than for traditional classes.	0–1	<i>0.08 ± 0.014</i>	0.47 ± 0.060	0.19 ± 0.015
I lacked knowledge/skills necessary for proper usage of tools utilized during online learning.	0–1	0.05 ± 0.011	0.17 ± 0.045	0.08 ± 0.010
I did not have adequate space for studying/attending online classes in my home.	0–1	0.05 ± 0.011	0.41 ± 0.059	0.14 ± 0.013
I didn’t have access to the necessary resources (reading rooms)	0–1	<i>0.10 ± 0.016</i>	0.47 ± 0.060	0.21 ± 0.015
Do you think the following classes are more in online or classroom form?	1–3 ^b			
Lectures		<i>1.10 ± 0.021</i>	2.32 ± 0.106	1.42 ± 0.028
Classes		2.05 ± 0.047	2.93 ± 0.043	2.30 ± 0.032
Labs		2.64 ± 0.048	2.93 ± 0.048	2.70 ± 0.030
Discussion classes		<i>1.68 ± 0.046</i>	2.72 ± 0.085	2.02 ± 0.036
Seminars		<i>1.49 ± 0.046</i>	2.59 ± 0.097	1.84 ± 0.038
Apprenticeships		2.49 ± 0.048	2.91 ± 0.053	2.61 ± 0.031
Workshops		2.21 ± 0.053	2.92 ± 0.042	2.43 ± 0.034
PE classes		2.47 ± 0.054	2.76 ± 0.085	2.58 ± 0.034
Foreign language classes		<i>1.55 ± 0.045</i>	2.68 ± 0.082	1.87 ± 0.036
What do you think about recording online classes in order to allow further studying?	1–4 ^c	1.25 ± 0.032	1.60 ± 0.119	1.30 ± 0.025
How would you rate your teacher efficiency in usage of digital tools during online learning?	1–5 ^d	1.66 ± 0.035	2.47 ± 0.097	1.91 ± 0.028
Do you feel the university requires physical interaction?	1–3 ^e	2.33 ± 0.030	<i>1.33 ± 0.060</i>	2.08 ± 0.025
Do you consider that in general the studying mode affects your possibility to express yourself in student space?	1–5 ^f	3.25 ± 0.092	3.67 ± 0.084	3.44 ± 0.055
Are you interested in participating in online courses organised internationally by various European universities?	1–0	0.95 ± 0.013	0.70 ± 0.061	0.89 ± 0.012
Would you like to be able to choose whether you’d participate in class remotely or in person?	1–3 ^g	1.12 ± 0.025	1.87 ± 0.113	1.28 ± 0.025

^a 1→ Digital platforms were well synchronized, 2→ I needed time to find all shared information and materials; ^b 1→ Online form is more beneficial, 2→Equally beneficial, 3→ Classroom learning is more beneficial; ^c 1→ I would consent to recording, 4→I wouldn’t consent to recording; ^d 1→All teachers were proficient in the usage of digital tools during online learning 5→ No teacher was proficient in the usage of digital tools during online learning; ^e 1→ Yes. the university can only be physical, 3→No. the university is not characterized by its physical space; ^f 1→ I find it a lot easier to express myself online, 4→I find it a lot easier to express myself offline; ^g 1→Yes. I would take that opportunity, 2→Yes. but I wouldn’t take that opportunity.

5. Discussion

We observed that, in general, women rated distance learning better than men. On the other hand, it can be seen that students of some faculties rate classes better than students of other faculties. The first hypothesis is that women, who are still the majority of students in some fields of study, constitute an even greater majority and this may affect the overall result. An alternative hypothesis is that the differences result primarily from the specificity of the study programs, so the observed gender differences are only an artifact resulting from the attractiveness of field of study for women and men (see Figure 2). When formulating the conclusions of the study, we decided to treat gender and the field of study as co-occurring variables, the strength of their influence on other variables may be the subject of a separate study.

Assessment of various aspects of distance learning, including the teachers' preparation, was largely dependent on the ailments experienced by the students. The conducted research does not allow to confirm the direction of this relationship, but could be the starting point for asking further research questions. Perhaps some of the ways in which distance learning is implemented contribute to the students' physical and mental health problems. Perhaps, however, individual cognitive distortions are influencing the global assessment of distance learning (psychological basis of adaptation to online learning is explored by Besser et al. [31]).

Looking at other results (e.g., concerning the reported ailments), a clear picture of two important categories of students emerges—"satisfied with everything" ("Tiggers") and "complaining about everything" ("Eeyores"). The first group, consisting mainly of women from social and humanities, appreciates the lecturers highly, has no problems with maintaining interpersonal contacts and does not suffer from more than one or two ailments. At the opposite extreme, we have the latter group - men from sciences, complaining of a number of ailments, evaluating the quality of remote education much lower. This may somehow be in line with Nguen et al. [32] who argued that women were more likely to stay connected before the pandemic by digital means. It should be emphasized that the predicted dependencies do not take into account other disciplines, Behere [24] conducted a similar study classifying students in the field of Engineering and Technology, obtaining interesting results. On the other hand, van Deursen in their article [33] argues that men are more likely to engage in COVID-19-related communication, but this may not be a good indicator as it is not a way to maintain social ties per se.

Both the current trend (decreasing number of students due to the upcoming demographic decline) and the results of the survey show that the development of infrastructure allowing for laboratory classes or seminars is much more important than building or maintaining large lecture halls. Already in 2020, on the eve of COVID-19 pandemics, Fein and Heap proposed [34] that by 2025 "these spaces should undergo evidence-based redesign and be transformed into active, flexible learning spaces" and "lectures should be consumed online and post-Covid universities and colleges will already have far more of them available online than before". On the threshold of another crisis, this time caused by soaring energy prices, such an approach seems even more justified.

The survey also showed that the assessment of the preparation of the lecturers is related to the self-assessment of one's own focus on the classes. This leads to a fairly obvious conclusion that it is worth shaping the skills of lecturers to conduct remote classes in an interesting way, considering that it will certainly be useful also in stationary teaching. How much attention to the quality of classes affects motivation or fatigue of students can be found in the work of Oliveira et al. [35]. Nissim and Simon [36] argue that, over time, adaptation to remote conditions has led to better student concentration in the classroom and overall better well-being. It should be noted, however, that our survey was conducted two years after the start of the pandemic, hence the initial adjustment stage should not have an impact on the overall assessment of remote education.

To the authors' surprise, the students indicated in the survey that mixed and hybrid classes are known innovations to students and are relatively often used by lecturers. How-

ever, the actual dissemination of such methods requires in-depth research beyond the scope of this study.

The concept of digital university was difficult even for the student working group involved in creating the survey. Nevertheless, for quite a lot of respondents, even such a vague idea seemed so interesting that they could imagine the existence of the university even without all its physicality. However, one cannot forget about an equally large group of students who cannot imagine a university in this way. Reconciling these two views will probably be a challenge for the entire academic community.

As it often turns out, the average is a poor indicator of the path to change. Two years of the pandemic, from the perspective of the surveys conducted at the Jagiellonian University, are sometimes ambiguous both in terms of experience and conclusions for the future. In the world of social studies and the humanities, the barrier of distance learning does not seem to be an obstacle to education. For science students, especially male students, the university must have its own physical dimension, without which both their concentration and motivation, but also their health and mental well-being seem to suffer.

It can be assumed that it is not only related to the specificity of studying in a given field (it is understandable that it is difficult for medical students to learn in isolation from patients in the hospital ...). Personality traits and cognitive skills, which caused the people to study this and not another field [5], may be behind how they are finding themselves in remote education. In order to examine it more thoroughly, it is necessary to combine the study of the perception of remote activities with the traits and cognitive skills test.

6. Conclusions

When designing changes and creating recommendations, you cannot do it for everyone together. Each department is different and has its own characteristics. Including students in the process of evaluating remote education should take place separately at each of the faculties, because both the conclusions and thoughts for the future may be different. One should also remember to take into account different points of view, for example women and men.

- We did not find any significant difference in perceptions of remote learning between freshmen and their older colleagues who had experienced classroom learning prior to the outbreak of the pandemic.
- Female students perceive distance learning better than male students.
- Students of different faculties perceive distance learning differently, and students of social studies and humanities evaluate distance learning much better than students of science or medicine.
- As both aspects (gender and faculty) are interdependent, we examined this in more detail and found that gender and the field of study are co-occurring variables that significantly differentiate the perception of various aspects of distance learning, direction and strength of their relationship with other factors require further studies.
- Opinions about remote classes differ depending on their characteristics, classes that require practical activities benefit from the stationary form.
- Students have their individual preferences, so regardless of the scope of pro-quality activities undertaken, one can expect criticism of remote education from the “Eeyores” and contentment from the “Tigers”.
- It is worth remembering the above conclusions when planning changes at universities, both organizational and infrastructural. Of course, decision makers should also remember that it is always worth investing in the skills of educators, which will be useful both for remote and stationary classes.

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Institutional Review Board Statement: Recommendations of the National Centre for Research and Development referred to by the JU Research Support Center (https://cwn.uj.edu.pl/pl_PL/projekty/dla-wnioskujacych/sprawy-prawne/badania-na-ludziach, accessed on 15 June 2022), indicate the scope of research on humans that requires the opinion of an ethics committee. Only anonymous data provided voluntarily by participants was used in the study. The participants entered the study voluntarily and were informed about its purpose, their behavior was not influenced in any way. The subject of the study does not include controversial issues that would require special sensitivity. The course of the study was not physically or mentally exhausting for the participants and it was possible to withdraw at any time. Thus, the method of conducting the research does not require obtaining a positive opinion from the relevant ethics committee.

Informed Consent Statement: Not applicable.

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