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Students of the Medical College against the background of three other faculties of the Jan Kochanowski University in Kielce

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Abstract: The need to limit people-to-people contacts during the COVID-19 pandemic introduced the need for distance learning at universities. After two years of pandemic restrictions, we decided to check the opinion of medical students and three other faculties on the conducted classes and compare groups with each other. We conducted a survey research based on standardized questionnaire which included 306 students from four faculties of the Jan Kochanowski University in Kielce – Faculty of Law and Social Sciences (1), Medical College (2), Faculty of Exact and Life Sciences (3), Faculty of Pedagogy and Psychology (4).

Students did not differ in the assessment of most types of classes conducted in a virtual form. The exceptions were virtual meetings in a group of students, which were better assessed at the faculty no. 1 compared to 2 and 4. Students of Medical College faculty differed in terms of assessing level of distance learning and their own involvement. Their ratings on these two issues were the lowest among the four groups. The students of individual faculties did not differ in terms of assessing the effectiveness of the elements of education in the traditional and remote modes of operation.

The subjective assessment of distance learning by students from various faculties shows subtle differences. The transition to distance education resulted in a decline in the involvement of medical students in their education and a subjective decrease in quality of teaching comparing to other faculties. This opinion may be taken into account when adapting curricula and selecting the type of classes to be conducted in the course of distance or hybrid learning.

Keywords: distance learning; covid-19; medical collage

1. Introduction

The COVID-19 pandemic affected the education system around the world. The need to reduce people-to-people contacts, sickness absenteeism, isolation and quarantine are just some of the challenges that the education system faced. The first case of COVID-19 in Poland was registered in March 2020; from then on, the epidemic affected the country considerably. In 2020, the incidence of COVID-19 reached the level of 34 258 people/one million of population. At that time, there were 755 mortalities/one million of population. (1) In the following year, the number of deaths increased almost 3.5 times per one million of population. By the end of 2021, more than 4 million cases were recorded in Poland. (2) From 20 March 2020 to 15 May 2022, the state of the epidemic was in force in Poland. (3) At that time, most universities in Poland conducted education in a remote system. At the university where the study was conducted, the quickest return to direct contact classes was enjoyed by the students of the medical faculty of Medical College, as early as the summer term of 2021. The other students had to wait for the return of the traditional system until mass vaccinations began.

Currently, some authors postulate that remote and hybrid learning may better fit the learning habits of contemporary students (millennials), for whom the electronic equipment (such as laptops, mobile phones) used during classes in a way unrelated to the topic becomes a distractor. The involvement of the use of equipment for class-related purposes will not allow for its simultaneous use for purposes not related to the topic. (4) In addition, the division of students into smaller discussion groups during online classes results in minimising intimidation and encourages participation in the discussion. (5)

Taking these postulates into account, the adherence to the traditional model of teaching in Poland and the unplanned transition to the remote teaching model we decided to conduct a survey research assessing the perception on remote form of education by students and compare the assessment made by students pursuing various majors of study taught at four faculties of our university.

2. Materials and Methods

We included 306 students in the study from four faculties of the Jan Kochanowski University in Kielce: Faculty of Law and Social Sciences (group 1), Medical College (group 2), Faculty of Exact and Life Sciences (group 3), Faculty of Pedagogy and Psychology (group 4).The number of recruited students at individual faculties is presented in Table 1. Minimal sample size was estimated based on paper by Louanglath (6) end estimated on minimal 52 subjects in each group. Recruitment took place among students who had classes in the main departments of the faculty during the week of the survey. Students completed the questionnaire during the break with the consent of the teachers, which allowed for a response rate of 96.8%. The only exclusion criterion from the study was the lack of participation in distance learning while it was being conducted.

In the study, we used a questionnaire developed by Romaniuk et al.; (7) the questionnaire was used in Polish with the consent of the authors. For the purposes of this article, it was translated into English (appendix A).

The survey consisted of four parts. The first part (questions 1-8) concerned demographic data. The second part concerned the assessment of individual forms of distance learning (questions 9a-9k), in this part, on a 5-point Likert scale, students assessed individual types of classes in which they participated. The third part concerned the assessment of the quality of distance learning as a whole (questions 10-12) and its individual elements (question 13a-13g) the assessment in this section also used a five-point Likert scale. In question 13 we used 5-point preference scale (between traditional (1) and distance learning(2)). The fourth part concerned a subjective assessment of the advantages and disadvantages of distance learning and based on open-ended questions (questions 14-17). All students completed the questionnaire in a paper form. The survey was anonymous.

Statistical analysis was performed using the Statistica 13.1 software (Tibco, Palo Alto). Qualitative data was presented as a percentage share, and the studied groups were compared using the Pearson

chi^2 test. The data based on students' answers to the questions using the five-point Likert scale is presented quantitatively. The central tendency is shown as a median, and the spread is presented as the interquartile range. The comparison of the groups was performed using the Kruskal Wallis test and the Dunn test was performed as a post-hoc test. The variation was considered statistically significant for $p<0.05$.

3. Results

We included 306 students in the survey. The demographic profile and the size of each group are presented in Table 1. The majority of students at each of the faculties had a computer exclusively available to them and internet access via cable network or optical fibre. The assessment of one's own IT competence did not differ between the students from particular faculties. All groups except Medical College, assessed that their IT competences during distance learning increased.

Table 1. Basic data on individual groups.

	1/Faculty of Law and Social Sciences (n=105)	**2/Medical College (n=78)**	**3/Faculty of Exact Sciences and Life Sciences (n=58)**	**4/Faculty of Pedagogy and Psychology (n=65)**	**p**	**post hoc**
Age [years]	22 (1)	21 (3)	23 (2)	21 (1)	<0.000	1-3; 1-4; 2-3; 3-2; 3-4
Year of study	2(1)	1(2)	3 (1)	1(1)	<0.001	1-2; 1-3; 1-4; 2-3; 3-4
sex (female, %)	54%	94%	59%	100%	p=.00000	
mode of studies - full-time on-site (question 3)	95%	100%	95%	98%	p=.06326	
IT competence (median, IQR) (guestion 4)	3(1)	3(1)	4 (1)	3(1)	0.24	
increase in IT competence level (question 5)	4(1)	3(1)	4(1)	4(1)	0.0275	1-2
owning a computer for personal use (question 6)	81.90%	85.80%	91.30%	87.50%	p=.00000	
internet connection via cable/optical fibre modem (question 7)	79%	78%	82.60%	80%	p=.00000	
use of assistance from the university during distance learning (question 8)	93%	92%	89%	92%	p=.05967	

The results of the survey in part 2 - concerning particular types of activities in which students participated are presented in Table 2. The median of all the ratings for most types of classes during distance learning at the faculties was above ambivalent (>3). An individual telephone conversation was an exception, for which the median rating given by students at all faculties was 3, meaning that it was ambivalent. At all faculties, recorded lectures received the highest scores (median average = 4.25). Classes in this form were particularly highly rated by the students of the Medical College (median = 5), however, this result did not differ significantly from the scores at other faculties. The only difference in the evaluation of various types of classes was noted in the rating of the virtual meetings of a lecturer with a group of students. Statistically,

this type of classes was rated significantly higher at the Faculty of Law and Social Sciences compared to Faculty of Pedagogy and Psychology and Medical College.

Table 2. Results of the comparison of the groups in terms of the questions concerning particular types of activities in which they participated. (5-point Likert scale)

Group	**1**	**2**	**3**	**4**	**p**	**post hoc**
question No./summary of the question	median (IQR)	median (IQR)	median (IQR)	median (IQR)		
question No. 9 - evaluation of various types of classes						
9a/virtual meetings in a student group	4(1)	3(1)	4(1)	3(1)	0.0012	1-2; 1-4
9b/virtual one-on-one meetings	3.5(1)	3(1)	4(1)	3(1)	0.05860	
9c/individual phone conversations	3(1)	3(1)	3(2)	4(1)	0.42000	
9d/chat	4(1)	4(1)	4(2)	4(0)	0.51790	
9e/instructions or assignments sent to students	4(2)	4(2)	4(2)	4(1)	0.55930	
9f/individual work on projects	4(2)	3(1)	4(1)	4(2)	0.18830	
9g/group work on projects	4(1)	4(1)	4(1)	4(1)	0.1337	
9h/links to content	4(2)	4(2)	4(2)	4(1)	0.47390	
9i/original materials from lecturers	4(1)	4(1)	4(1)	4(1)	0.86870	
9j/non-proprietary materials from lecturers	4(2)	4(1)	4(2)	4(1)	0.71430	
9k/recordings of lectures	4(2)	5 (2)	4(2)	4(2)	0.26880	

Regard evaluating the level of distance learning level offered by the university (Table 3), in groups 1 and 3 the level was rated above the average, and the score was statistically higher than in groups 2 and 4, where the level was assessed as average. The evaluation of one's own involvement in distance learning was the lowest in the case of faculty 2 students, and the difference was statistically significant in relation to groups 1 and 3 (question 11). The self-reliance of the students did not differ between groups, and it was assessed above the average by all the groups (question 12). Students of faculty 2 believed that their involvement in the learning process is greater in the case of traditional education although the difference between faculties was at the border of statistical significance, the post hoc test show no statistical differences. No differences were observed in the terms of assessing one's own activity and contact with the lecturer. However, in the case of the second variable, students of all groups believed that it is better in the traditional teaching model. The students in the group 2 think that the regularity of work is greater in the traditional model, the rest of the faculties believed that the form of teaching has no relation to a consistent manner of work. The students of all faculties believed that the form of learning does not affect the timeliness, quality of tasks performed, as well as the adequacy of the grades received.

Table 3. Results of group comparison for questions about the quality of distance learning. (5-point Likert scale).

Group	**1**	**2**	**3**	**4**	**p**	**post hoc**
question No./summary of the question	**median (IQR)**	**median (IQR)**	**median (IQR)**	**median (IQR)**		
10/evaluation of distance education level	4(2)	3(1)	4(1)	3(1)	0.00760	1-2
11/level of one's own involvement	4(2)	3(2)	4(1)	4(1)	0.00270	1-2; 2-3
12/self-reliance	4(2)	4(2)	4(2)	4(2)	0.59680	
question No. 13/assessment of the differences between traditional and distance learning						
13a/one's own involvement	3(2)	2(2)	3(2)	3(2)	0.04540	No difference
13b/one's own activity	3(2)	2(2)	3(2)	3(1)	0.19200	
13c/contact with the lecturer	2(2)	2(2)	2(2)	2(2)	0.13110	
13d/consistent manner of work	3(2)	2(2)	3(2)	3(1)	0.00040	1-2
13e/timeliness of completed tasks	3(1)	3(1)	3(1)	3(0)	0.13000	
13f/quality of completed tasks	3(1)	3(1)	3(0)	3(1)	0.05800	
13g/adequacy of the grades awarded	3(2)	3(1)	3(0)	3(1)	0.77660	

The open questions from section 4 were assessed as a whole without a division into groups. The students from all groups identified the following as the advantages of distance learning – saving time (31%), no need to commute (22.3%), comfort of learning at home (19.5%) and reducing the costs of participation in classes (8.3%). Among the disadvantages of distance education, the most commonly mentioned factors were limited contact with the lecturers (23%) and other students (15.6%) as well as technical issues (17.1%). Among the greatest difficulties associated with distance education, students mentioned technical problems (33.7%) and lower motivation to learn. (12.5%)

4. Discussion

Despite major program differences between the faculties, the study indicates only subtle differences in the results of the survey at various departments. The groups differed in the evaluation of virtual meetings in a group of students, which were particularly highly rated at the Faculty of Law and Social Sciences. This may be related to the essence of studies, as the interpretation and discussion of a presented problem is a particularly important element, and this teaching model engages all students in the discussion. One of the majors where distance learning has been present for years, in some countries (such as the UK) on a massive scale, is the law sciences. (8)

In our study, we observed significant differences between faculties when it comes to students' assessment of the level of classes and own's involvement. Medical students tended to give lower assessment on these two issues, which distinguished them from law and science students (only in the case of involvement level). In the literature, there are a number of papers dealing with distance learning in medicine, as the transition to this model of learning was conducted in an emergency mode around the world. Medicine, especially in its practical aspect (clinical teaching), has never been taught remotely, and medical practice uses all the senses for diagnostics on a daily basis. Students cannot be remotely taught empirical diagnostics and treatment based on, for example, smell and touch. These

differences and the lack of physical contact with the patient may be the reason why CM students rated their own involvement and work regularity during distance learning as significantly lower. In practice, both issues are strongly related to motivation. Other authors also point to the issue of low motivation in teaching medicine remotely. (9) Among medical doctors, the main factor strongly diminishing motivation for self-education is the reduction of contacts with patients. (10) Extrapolating this correlation to medical students, the overall satisfaction could increase after separating practical teaching from theoretical teaching during distance learning, which is associated with greater acceptance among students (so-called blended classes). (11) However, prior to the mass vaccination programme, this was not feasible due to the exposure of patients to a group of people potentially infected with the SARS-CoV-2 virus. In this light, the pandemic intensively catalysed the emergency change of approach to teaching science. The students' rating could be higher if the transition process had been gradual and allowed for appropriate adaptation of the curriculum.

However, the literature shows that learning medicine online in the remote mode is not given straightforwardly negative ratings by students. In a study carried out during the lockdown in India, 51.7% of students would not want to continue education in this form, but the remaining part was ambivalent or would like this form of learning to be an element of studying. (12) A study in Saudi Arabia showed that synchronous online learning is accepted by medical students, but pre-clinical students were more willing to continue this form of education in the following years than clinical students. (13)

The advantages and disadvantages of distance learning raised by students in our study do not differ from those described in the literature. Time savings associated with no commuting, as a positive aspect of distance learning, is the main element raised in the literature. (14) (15) In our survey, the lack of socialisation with other students, as well as the lack of contact with lecturers was often mentioned as a disadvantage of distance learning. This is an element specific to our study, as it was rarely shown as a disadvantage in the literature. (14) (15) Literature data indicate that social learning community is extremely important for achieving educational successes in higher education. (16) The activities of social learning community may be disturbed especially by asynchronous delivery, where the content of lecturers may be played at different times by students, leading to the atomisation of student groups.

We also conducted research among academic teachers who compared elements of remote teaching on a Likert scale, which we published in a separate work. (17) The majority of these elements were evaluated in favor of traditional teaching. The exception was the assessment of the timeliness of performed tasks, which was evaluated as not different from that in traditional learning in distance learning.

The advantage of our work is undoubtedly the initiation of research after the pandemic period came to an end, when all students returned to traditional learning. This gives all students (also those who started studying during the distance learning period) a chance to have a point of reference. Other advantage of this study is the fact of covering students from four different faculties. The main goal was to find differences between students attending Medical Collage and other majors of study, which differ in their specificity. In practice, it turned out that mostly these differences do not exist or are so insignificant that the statistical power of our study does not allow for their accentuation. The exceptions concerning medical students were discussed in the previous part of the discussion.

The limitation of this study consisted in the inclusion of a different number of students recruited at given faculties, as well as differences in the demographic characteristics of individual groups. Additionally, students' evaluations may have differed depending on their individual work organization, which varied slightly depending on the department being evaluated. This is due to organisational difficulties and the difference in the total number of students and their demographic structure at particular faculties, but in our opinion, this does not ultimately affect the final result of the study.

5. Conclusion

The subjective assessment of distance learning by students from various faculties shows subtle differences. The transition to distance education resulted in a decline in the involvement of medical

students in their education and a subjective decrease in quality of teaching comparing to other faculties.

Supplementary Materials: appendix A - the content of the survey

Author Contributions: For research articles with several authors, a short paragraph specifying their individual contributions must be provided. The following statements should be used "Conceptualization, B.G. and A.S.; methodology, A.S, B.G. .; software, J. M. .; formal analysis, J.M.; investigation, A.P..; resources, J. M. .; data curation, M.M, J.M..; writing—original draft preparation, J.M., A.S, M.M; writing—review and editing, J.M., A.S, M.M.; visualization, B.G., G.S..; funding acquisition, J.M. . All authors have read and agreed to the published version of the manuscript."

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Appendix A

Content of survey.

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Appendix A

Questionnaire for students

The survey procedure will take about 10 minutes. As an interviewee, you will be asked to answer questions about your experience with distance education and learning in a socially isolated situation. Participation in this scientific research is voluntary. The data we collect is confidential. As researchers, we are unable to identify you through the system. By completing the questionnaire, you confirm that you have read the instructions and consented to the survey.

Year of birth .....

1. Sex

1) Female
2) Male

2. Year of study

1) 1
2) 2
3) 3
4) 4
5) 5

3. Mode of studies

Please select one answer

1) Full-time on-site
2) Part-time

4. How would you rate your IT skills?

Please select one answer

1	2	3	4	5

Low High

5. How would you rate the change in the level of your IT skills in the course of distance learning?

Please select one answer

1	2	3	4	5

Definitely decreased increased

6. What technical capabilities related to participation in remote classes do you have at home?

Choose as many answers as you want

1) I have a computer for my own use
2) I have a computer, but I share it with other household members
3) I use mobile devices (e.g., smartphone, tablet)
4) I do not have a computer at home
5) Other: .....

7. How do you connect to the Internet?

Choose as many answers as you want

1) Cable modem / optical fibre
2) Wireless Internet via mobile modem with SIM card
3) Sharing the Internet via smartphone
4) I do not have any Internet connection at home
5) Other: .....

8. Have you used the support of the university in the field of distance learning?

Choose as many answers as you want

1) Yes, I have used shared equipment
2) Yes, I have used technical support
3) Yes, I have participated in training courses
4) No
5) Other:

9. How would you rate a given form of distance learning?

Please select one answer per line

	I do not participate in this form of classes	I am very reluctant to take part in this form of classes	I am reluctant to take part in this form of classes	Neither willingly nor reluctant to take part in this form of classes	I am happy to take part in this form of classes	I am very happy to take part in this form of classes
a)Virtual meetings in a group of students						
b) Individual virtual meetings						
c) Individual phone calls						
d) Chat						

e) Instructions describing the issues/tasks sent to the students						
f) Individual work on projects/problems in designated communication channels (e.g., in Teams files)						
g) Group work on projects/problems in designated communication channels (e.g., in Teams files)						
h) Links to important content, videos, etc.						
i) Scans, photos, presentations original materials from lecturers						
j) Scans, photos, presentations of materials by authors other than lecturers						
k) Recordings of lectures						

10. How would you rate the level of distance learning offered by the university during the 2020/2021 winter term and the 2020/2021 summer term?

Please select one answer

1	2	3	4	5

Very low Very high

11. How do you evaluate the degree of your involvement in distance learning?

Please select one answer

1	2	3	4	5

Low High

12. How do you evaluate your self-reliance during distance learning?

Please select one answer

1	2	3	4	5

Low High

13. Which elements of distance learning are different from traditional education? *Please select one*

	Much higher in the case of traditional education	Higher in the case of traditional education	The same in the case of traditional and distance education	Higher in the case of distance learning	Definitely higher in the case of distance learning
a) My own involvement					
b) My own activity					
c) Contact with the lecturer					
d) Systematic approach to work					
e) Timely performance of tasks					
f) Quality of completed tasks					
g) Adequacy of the grades received					

answer per line

14. What do you think are the most important advantages of distance learning?
Please enter your own answer
.....

15. What do you think are the most important disadvantages of distance learning?
Please enter your own answer
.....

16. In your opinion, what are the most important difficulties associated with distance learning?
Please enter your own answer
.....

17. If you have any reflections or comments regarding distance learning, please write them below
Please enter your own answer
.....