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IMPACT OF COVID-19 ON LEVEL OF STUDENTS' MOTIVATION TO STUDY – INCREASING AND DECREASING FACTORS

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Abstract: Currently, the COVID-19 pandemic is the subject of many studies, analyses, and research considerations regarding all areas or areas of life. Its impact on the education sector is extensively analyzed as its occurrence has caused a revolution in various systems and levels of education. Previous publications on the impact of the COVID-19 pandemic on the education sector most often concern issues related to the transition to online teaching or the extensive use of modern computer technologies that enable the entire teaching process. However, the impact of the pandemic on the motivation to learn, both positively and negatively, has not yet been examined. Considering the above, the article presents two groups of factors illustrating the impact of the COVID-19 pandemic on the motivation to learn. The conducted research and analyses made it possible not only to specifically identify these factors but also to identify significant differences depending on the adopted criteria. Based on the research, it can be concluded that the negative factors had a more substantial impact on the decrease in motivation than the positive factors.

Keywords: COVID-19, factors, motivation, pandemic, students

JEL Classification: B55, I23, I22

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Introduction

The COVID-19 pandemic lasted almost two years and it not only affected every area of the average person's life but it also changed the whole world. Thus, it is the subject of many different scientific studies analyzing its impact on various areas of life.

One of the areas where the pandemic has left its mark is undoubtedly the area of education in all its dimensions – primary, secondary and higher. For almost two years, all lessons and classes were conducted online, which on the one hand, had a negative impact on students, but on the other hand, contributed to the widespread use of modern technologies used in the learning process.

Motivation plays a significant role in the learning process, and it is one of the most important factors affecting learning. The COVID-19 pandemic also affected the level of motivation to learn, on the one hand lowering it, but on the other hand, being a source of new factors positively influencing the level of motivation to learn. Therefore, this article aims to identify the factors resulting from the COVID-19 pandemic, affecting both positively and negatively the motivation to study among students, and then to assess them among the surveyed population. Identification of both of these groups of factors was carried out based on analysis of the available literature (Arora & Srinivasan, 2020; Blankenberger & Williams, 2020; Ali et al., 2020, Pasion et al., 2020; Escamilla-Fajardo et al., 2021; Weldon et al., 2021; Lei & So, 2021) and supplemented based on the authors' own experience as academic lecturers.

Literature review

Already during the COVID-19 pandemic, many researchers conducted a number of studies to determine its impact on specific fields or areas, among others: the functioning of enterprises (Ariyani et al., 2021), the level of entrepreneurship among women (Vukovic & Nevalennyi, 2021; Milojević et al., 2021; Tasnim, 2021), the development of purchasing attitudes (Khalid, 2021), the functioning of global supply chains (Alsmairat, 2021) or human resources management (Csakay et al., 2021). It can be safely assumed that almost every aspect or area has been examined in terms of the impact of the pandemic on its functioning or development. A great deal of research also concerned the impact of the COVID-19 pandemic on the education sector, as undoubtedly the global spread of the pandemic was an enormous challenge for this sector (Liguori & Winkler, 2020).

The pandemic primarily disrupted the functioning of universities by the need to immediately switch to online learning, which was significantly different from conventional distance learning. Online learning was suddenly implemented, contributing to phenomena that disrupted the learning process (Krishnamurthy, 2020), such as difficulties in conducting tests or assessment exams remotely (Guangul et al., 2020), the need to strengthen the digital skills of teachers, sources of learning or communication between universities and students (Tejedor et al., 2020). It was also shown that online teaching models and virtual systems adopted during the pandemic should remain permanent (Camilleri, 2021). Thus, the form of education which

is blended learning should become an inseparable element of education, constituting the basis for teaching, ensuring the highest quality of online education and effective achievement of the intended teaching goals (Shahrill et al., 2021). The process of evolution of teachers' digital competences, their relation to students' digital skills and impact on the learning process was investigated (Núñez-Canal et al., 2021). The level of digitization, increased by the conditions resulting from the pandemic, and its impact on reducing the gap between academia and industry were also studied (Márquez-Ramos, 2021). The factors determining the productivity of lecturers during remote work in the conditions of the COVID-19 pandemic were analyzed, indicating that the individual digital orientation of a given person has a significant impact on their digital capabilities, which in turn affected their productivity when working from home during the COVID-19 pandemic (Afrianty et al., 2022). In addition, the results of the conducted research demonstrated that the digital process of learning civic behavior can be a positive response to the period of lockdown due to the COVID-19 pandemic (Akcil & Bastas, 2021). Research carried out in this context also focused on online learning and change management theories, providing recommendations for teachers in educational institutions on dealing with the crisis (Anthony & Noel, 2021). The following were also analyzed: the need for educational institutions to respond to the pandemic by building resources and factors and taking actions that result in an effective learning environment (Pandit & Agrawal, 2022); the emotional challenges of students experiencing lockdown in the early stages of the pandemic (English et al., 2022); the possibilities of IoT technology in the field of continuous monitoring and flexible management of the learning process (Ilieva & Yankova, 2020) or the level of productivity of women scientist-academics during the COVID-19 pandemic (Walters et al., 2022).

However, the impact of the COVID-19 pandemic on the level of motivation to learn among students, both in a positive and negative aspect, has not yet been thoroughly investigated. It is commonly believed that the pandemic has only had a negative impact on the level of motivation to learn, e.g. through social isolation, a sense of uncertainty or difficult contact with the teacher. Nevertheless, this article indicates that the COVID-19 pandemic has also contributed to an increase in the level of motivation to learn, e.g. by making the entire teaching process more flexible, introducing new technologies or getting closer to the teacher through the possibility of establishing closer contact via appropriate applications.

Research methodology

In order to achieve the research goal defined above, qualitative research was conducted following the interpretative paradigm. The justification for the conducted qualitative research is that the COVID-19 pandemic and its impact on the level of motivation to study among students is not only a new and complex phenomenon, but also concerns important social issues. On the other hand, the interpretive paradigm assumes that reality is perceived by the people taking part in the study.

The research aimed to find answers to the following research questions:

RQ1: How has the COVID-19 pandemic affected students' motivation to learn?
RQ2: Which groups of factors (increasing and decreasing) have a more significant impact on the level of motivation to learn?

The above questions were the impulse to conduct the first part of the research, while the second part of the research was carried out to verify the following research hypotheses:

H1: There are significant relationships between the field of study and the perception of the impact of the COVID-19 pandemic on the motivation to learn.
H2: There are significant relationships between gender and the perception of the impact of the COVID-19 pandemic on motivation to learn.

The research was carried out from October to December 2022 among students of Czestochowa University of Technology. More than 450 research questionnaires were distributed among them. The research was conducted using the CAWI (computer-assisted web interviewing) method, in which respondents completed a survey posted on a website. The study used the simple random sampling method as the simplest method of selecting the research sample. It involves the direct and unlimited selection of research units into the statistical sample directly from the general population and without restrictions.

For data processing and analysis, the trusted tools of MS Excel and Statistica were used. The study focused on respondents who had student status during the COVID-19 pandemic, providing a unique perspective on this specific group. 404 questionnaires were qualified for the final research and analysis. Some returned questionnaires contained formal errors and a dozen were not returned at all.

Minimum sample size

In 2022, Poland had over 1.2 million students. Such a large population requires the minimum size of the research population to be determined so that the condition result representativeness is met. The minimum sample size to estimate the probability of p success in the general population was calculated based on the formula for a sample size with a vast population. This formula allows one to obtain a predetermined accuracy of estimating the population structure ratio. After substituting into the formula the adopted values, the following equation was received:

$$N_{min} = \frac{N_p\ (\alpha^2 * f(1-f)}{N_p * e^2 + \ \alpha^2 * f(1-f)} = \ 383.87 \qquad (1)$$

As the calculations show, the minimum sample size, with the adopted confidence level 1-2 = 0.90 and the accepted level of highest error e = 5%, should be 384 questionnaires. Because the study involved 404 questionnaires, it can be assumed that this condition has been met.

Descriptive statistics

The metric part of the questionnaire contained questions about the respondents' gender and fields of study (Table 1).

Table 1. Descriptive statistics

Characteristics		Frequency	%	Cum. %
Gender	Women	264	65	65
	Men	140	35	100
Field of study	Design and Project Management	21	5	5
	Finance and Accounting in Business	178	44	49
	Logistics	134	33	82
	Quality and Production Management	17	4	86
	Management	54	14	100

Source: Authors' own work based on research

The descriptive statistical results showed that in the structure of the surveyed students, most of them were women (65%). Concerning the fields of study, the most significant percentage of respondents was Finance and Accounting in Business students.

Part of the survey concerned examining the impact of the COVID-19 pandemic on the level of motivation to learn (Table 2). As mentioned in the Introduction, the factors included in the table were developed based on available literature and the authors' own experience as academic lecturers.

Table 2. Impact of COVID-19 pandemic on motivation to learn

Increasing factors	Variables
Need for self-organization	1.1
Increasing flexibility of learning	1.2
Constant access to teaching materials	1.3
Possibility of taking up full-time job	1.4
Possibility of studying two fields of study at same time	1.5
Use of popular applications (TikTok, YouTube) in learning process	1.6
Saving money (no need to rent dormitoryroom/apartment, travel costs, meals)	1.7
Increasing ability to use modern ICT technologies	1.8
Higher level of concentration	1.9
Faith that pandemic will come to an end and everything will return to normal	1.10
Possibility of using various forms of studying	1.11
Introduction of innovative forms of studying	1.12

Decreasing factors	Variables
Lack of sense of social belonging	2.1
Lack of sense of empowerment	2.2
Lack of control	2.3
Feeling of gaining incomplete knowledge	2.4
Lack of personal interaction with lecturer	2.5
Routine	2.6
Uninteresting teaching materials	2.7
Too difficult material for self-learning	2.8
Lack of help from lecturer	2.9
Fear of evaluation	2.10
Laziness	2.11
Isolation	2.12

Source: Authors' own work based on research

The nature of the responses to the above issues took the form of responses on a 5-point Likert scale. The scale used in the study consisted of 5 answer categories (5 – definitely yes, 4 – yes, 3 – do not know, 2 – no, 1 – definitely no), which were arranged in the correct order. For all the variables, Cronbach's alpha values were higher than 0.80, which means that the scale's reliability is acceptable.

Research results

Making a general analysis of the assessment of averages for factors characterizing the impact of the COVID-19 pandemic on the motivation of to study, among those increasing, the highest scores were given to factors in the form of the need for self-organization (3.61), faith the pandemic will come to an end, and everything will return to normal (3.59), time savings (travelling to the university (3.55) and the possibility of using various forms of studying (3.36) (Table 3).

On the other hand, among the factors decreasing the motivation to learn, the factors in the form of uninteresting teaching materials (4.88), lack of sense of empowerment (4.72), the lack of help from the lecturer (4.71) and the lack of a sense of social belonging (4.63) were given the highest scores. However, it is evident that the impact of the COVID-19 pandemic on the motivation to learn has been negative rather than positive.

Based on the obtained results, it was possible to find answers to the research questions formulated above.

Table 3. Evaluation of averages for analyzed issues

Motivation to study - influence of COVID-19			
Increasing		Decreasing	
1.1	3.61	2.1	4.63
1.2	3.11	2.2	4.72
1.3	3.19	2.3	4.13
1.4	3.65	2.4	4.51
1.5	3.25	2.5	4.43
1.6	3.55	2.6	4.61
1.7	3.28	2.7	4.88
1.8	3.22	2.8	4.22
1.9	3.25	2.9	4.71
1.10	3.59	2.10	4.55
1.11	3.36	2.11	3.89
1.12	2.98	2.12	4.34
		2.13	3.78

Source: Authors' own work based on research

Next, in order to make a comparison between the selected groups of respondents, the non-parametric Mann–Whitney *U* test was used. This test made it possible to determine whether there are statistically significant differences between the selected groups of respondents in assessing the impact of the COVID-19 pandemic on the motivation to learn (increasing and decreasing factors). Owing to the limitations resulting from the maximum length of the article, the conducted tests concerned the comparison of groups of respondents differing from each other in the field of study and gender:

- Design and Project Management (DPM),
- Finance and Accounting in Business (FAB),
- Logistics (L),
- Quality and Production Management (QPM),
- Management (M),
- Men and women.

Table 4 below presents the test values for the positive impact of the COVID-19 pandemic on the motivation to learn for students of the selected fields of study. At the same time, only those factors were listed in relation to which significant differences in their perception were noted for individual groups of students.

Table 4. Mann–Whitney *U* test results for positive influence of COVID-19 pandemic on motivation to study

Variable	DPM/FAB		DPM/L		DPM/M	
	Z	***p***	***Z***	***p***	***Z***	***p***
1.2	-	-	−0.289	0.035	−0.806	0.036
1.4	-	-	−0.034	0.039	−0.352	0.048
1.5	0.879	0.042	-	-	-	-
1.6	0.389	0.037	-	-	-	-
1.7	−1.549	0.034	0.653	0.035		
1.9	0.089	0.025	-	-	-	-
1.10	-	-	−0.321	0.022	-	-
1.11	-	-	-	-	0.342	0.045
Variable	**QPM/M**		**FAB/L**			
	Z	***p***	***Z***	***p***		
1.2	-	-	−1.983	0.047		
1.3	4.044	0.000	-	-		
1.5	−2.103	0.035	3.449	0.000		
1.9	−2.181	0.029	2.504	0.012		

Source: Authors' own work based on research

Explanation: the results in the tables indicate that the factors in them significantly affect the motivation to learn, both positively and negatively, among the selected groups of respondents.

The results presented in the table above indicate that, firstly, as many as nine factors increasing the motivation to learn are significant. Nevertheless, three of them: the need for self-organization, increasing the ability to use modern ICT technologies, the introduction of innovative forms of studying, and strong determination to stay at the university during the pandemic period do not affect the level of motivation to learn. On the other hand, selected groups of respondents considered the increasing flexibility of learning, the possibility of studying two fields of study at the same time, and a higher level of concentration as the most important factors. The flexibility of learning results from the fact that classes are conducted online, often taking the form of students' freedom to participate in classes, e.g. getting acquainted with the material at 10.00 in the evening or 6.00 in the morning. While initially the university authorities requested that online classes be held during the same hours as traditional classes, network overload, which caused breaks and disruptions in classes, meant that teachers gained time flexibility in conducting classes online. This flexibility of classes also enabled students to take up another field of study. The effect of this was, among others, the lack of an assumed drop in the number of people applying for

studies because among those enrolling for the first year of study, many people were already studying a particular field of studies.

On the other hand, the higher level of concentration results from the fact that the implementation of studies in the online form requires more significant commitment and concentration on the part of the student and the ability to organize the course of studies independently. After all, it is done without the participation of the teacher.

Table 5. Mann–Whitney *U* test results for negative influence of COVID-19 pandemic on motivation to study

Variable	DPM/FAB		FAB/QPM		FAB/M	
	Z	***p***	***Z***	***p***	***Z***	***p***
2.1	-	-	2.330	0.019	-	-
2.2	2.301	0.021	-	-	-	-
2.3	-	-	-	-	2.176	0.029
2.4	-	-	2.144	0.031		
2.5	3.347	0.000	-	-	2.279	0.022
2.6	2.617	0.008	-	-	-	-
2.7	-	-	-	-	2.570	0.010
2.8	2.340	0.019	-	-	-	-
2.9	-	-	2.157	0.030	-	-
2.12	-	-	2.343	0.019	-	-

Variable	FAB/L		L/QPM	
	Z	***p***	***Z***	***p***
2.3	-	-	−2.319	0.020
2.5	2.172	0.029	-	-
2.7	-	-	−2.489	0.015
2.9	−2.389	0.016	-	-
2.12	-	-	−2.445	0.014
2.13	2.254	0.024	-	-

Source: Authors' own work based on research

Nonetheless, concerning the negative impact of the COVID-19 pandemic on the motivation to study, almost all the factors were indicated as significant by specific groups of respondents. Only the laziness factor was not selected at all, which may indicate that, on the one hand, the respondents do not consider themselves lazy. On the other hand, innate laziness affects other areas of life, not the motivation to learn.

In contrast, the most frequently indicated factor negatively affecting the motivation to learn was the lack of personal interaction with the lecturer, which shows that direct contact with the lecturer is essential for students and can play a significant role

in the course of studies and greatly affect the level of motivation to learn. Also, factors in the form of a lack of sense of social belonging, lack of control, uninteresting teaching materials, lack of help from the lecturer, and isolation were quite often indicated as those that significantly reduce the level of motivation to learn. The factors in the form of a lack of a sense of social belonging, lack of control, and isolation can be treated as interdependent factors because, for example, isolation may cause a lack of a sense of social belonging and a lack of control. On the other hand, the other two factors, uninteresting teaching materials and lack of help from the lecturer, clearly indicate that the lack of lecturer involvement in the teaching process translates into a lack of motivation to study among students.

Then the test values for both groups of factors for students were grouped by gender (Table 6). At the same time, only those factors in relation to which significant differences in their perception were noted for individual groups of students were listed.

Table 6. Mann–Whitney *U* test results for both groups of factors

Increasing factors	Men/Women		Decreasing factors	Men/Women	
	Z	***p***		***Z***	***p***
1.1	2.314	0.020	2.1	-	-
1.4	-	-	2.4	2.057	0.039
1.5	−2.265	0.023	2.5	-	-
1.6	-	-	2.6	−2.017	0.043
1.7	-	-	2.7	−2.100	0.035
1.8	2.019	0.043	2.8	-	-
1.9	−2.037	0.041	2.9	1.980	0.047
1.11	2.169	0.030	2.11	−2.057	0.039
1.12	-	-	2.13	−2.145	0.031

Source: Authors' own work based on research

However, concerning the groups of respondents divided into women and men, for women, the most important factors increasing the motivation to study were the possibility of studying two fields of study at the same time and a higher level of concentration. For men, factors in the form of the need for self-organization, increasing the ability to use modern ICT technologies, and the possibility of using various forms of studying were the most important. When analyzing the factors reducing the motivation to learn, the women indicated the following: routine, uninteresting teaching materials, laziness, and the fear of getting sick. For men, significant factors reducing the motivation to learn were the feeling of gaining incomplete knowledge and lack of help from the lecturer.

Based on the obtained results, it can be concluded that the research hypotheses formulated for the research were positively verified.

On the one hand, these results are consistent with the results of analyzes conducted among groups divided into particular fields of study. On the other hand, for men, the factors related to increasing the ability to use modern ICT technologies and the possibility of using various forms of studying turned out to be the need for self--organization, the ability to use modern ICT technologies and the possibility of using various form of studying. However, they are afraid that the knowledge obtained in this way will be incomplete in some way. Concerning women, the routine resulting from confinement and the fear of getting sick significantly reduced the motivation to learn.

Conclusions

In general terms, the negative factors had a more substantial impact on the decrease in motivation than the positive factors. Therefore, it can be concluded that the COVID-19 pandemic caused a general decrease in the motivation to learn as the highest-rated increasing factor received a lower score (3.65) than the lowest decreasing factor (3.78).

In this area, many studies have been conducted on the impact of the COVID-19 pandemic on the motivation to learn among students, among others: the effect of online education caused by the COVID-19 pandemic, on the motivation of students of business and economics (Machado et al., 2024); the impact of mental illness on students' motivation, attention, and social connections, factors that are crucial in influencing their academic achievements (Sen et al., 2024); the effect of personal, teaching and institutional factors on students' academic performance during the COVID-19 pandemic (Anatan et al., 2024); the way female students of technical universities perceive learning science, technology, engineering, and mathematics online and the factors that influence their motivation to learn during COVID-19 (Sung & Huang, 2024); the impact of psychological variables on the motivation of university students during the pandemic (Cardella et al., 2024) and the potential mediating effect of intrinsic motivation among students during the pandemic (Zhang et al., 2024).

However, the above studies did not directly address the impact of the pandemic on the motivation to learn in both positive and negative aspects. The aim of the article was to examine this direct relationship, which was an attempt to answer the formulated research questions and research hypothesis.

The above results indicate that, depending on the selected group, factors which increase or decrease the motivation to learn are perceived and assessed differently. In this case, the analyzed groups differed in the field of study and gender, hence it can be assumed that distinguishing groups according to other criteria would also indicate significant differences in the perception of both groups of factors (positive and negative). At the same time, it should be borne in mind that the results of the research presented above are only a fragment of the analysis that fits into the area of the impact of the COVID-19 pandemic on the motivation to learn. Further research can analyze how the COVID-19 pandemic changed not only students' attitudes toward studying but also whether it influenced the university's activities to increase

or maintain a constant level of motivation to learn. Also, in the future it is worth considering the use of advanced statistical analysis methods, e.g. classification trees for the analyzed issue.

Nevertheless, the identification and analysis of the highlighted factors undoubtedly constitute the added value of the article and may serve as guidelines for universities in managing students' motivation to study. The results presented in this article can help universities to develop, redefine and reconceptualize learning processes in the post-COVID-19 era.

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WPŁYW COVID-19 NA POZIOM MOTYWACJI DO NAUKI WŚRÓD STUDENTÓW – CZYNNIKI ZWIĘKSZAJĄCE I ZMNIEJSZAJĄCE

Streszczenie: Obecnie pandemia COVID-19 jest przedmiotem wielu badań, analiz i rozważań badawczych dotyczących wszystkich aspektów czy dziedzin życia. Wpływ pandemii na sektor edukacji jest szeroko analizowany, gdyż jej wystąpienie spowodowało rewolucję w różnych systemach i poziomach edukacji. Dotychczasowe publikacje na temat wpływu pandemii COVID-19 na sektor edukacji najczęściej dotyczą zagadnień związanych z przejściem na nauczanie online lub z szerokim wykorzystaniem nowoczesnych technologii komputerowych, które umożliwiają realizację całego procesu nauczania. Jednakże nie zbadano dotychczas wpływu pandemii na motywację do nauki, zarówno pod kątem pozytywnym, jak i negatywnym. Mając na uwadze powyższe, w artykule zaprezentowano dwie grupy czynników obrazujących wpływ pandemii COVID-19 na motywację do nauki. Przeprowadzone badania i analizy pozwoliły nie tylko na specyficzną identyfikację tych czynników, ale także na identyfikację istotnych różnic w zależności od przyjętych kryteriów.

Słowa kluczowe: COVID-19, czynniki, motywacja, pandemia, studenci