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EDITED BY

Ryan Limbocker,
United States Military Academy West Point,
United States

REVIEWED BY

Joseph Hanus,
United States Military Academy West Point,
United States
Stefan Lundqvist,
Swedish Defence University, Sweden

*CORRESPONDENCE

Claudiu Coman
✉ claudiu.coman@unitbv.ro

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The influence of COVID-19 on the learning and developing processes of practical skills in military educational institutions

Maria Cristina Bularca¹, Stefania Bumbuc², Ghita Barsan²,
Claudiu Coman^{3*}, Alexandru Bucoi⁴, Andreea Hertanu⁵,
Adrian Netedu⁶ and Ioan Aron⁷

¹Faculty of Sociology and Communication, Transilvania University of Brasov, Braşov, Romania, ²"Nicolae Bălcescu" Land Forces Academy from Sibiu, Sibiu, Romania, ³Faculty of Sociology and Communication, Transilvania University of Brasov, Braşov, Romania, ⁴Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov, Braşov, Romania, ⁵Faculty of Economic Sciences and Business Administration, Transilvania University of Brasov, Braşov, Romania, ⁶Faculty of Philosophy and Social-Political Sciences, University "Alexandru Ioan Cuza", Iasi, Romania, ⁷Faculty of Law, Transilvania University of Brasov, Braşov, Romania

During the COVID-19 pandemic, the educational process in military higher education institutions underwent changes, especially in terms of carrying out practical activities. The purpose of the research was to analyze how the COVID-19 pandemic influenced the educational process and the leadership activities carried out in a Romanian military academy, in the context in which the practical activities had to be carried out in the online environment. Practical skills play an important role in the life of military students and they can help them within the process of becoming efficient leaders. In the context of the research, practical skills refer to decision-making abilities, conflict resolution skills, communication skills, the ability to delegate, or the capacity to motivate and inspire others. In order to conduct the research, we used a quantitative approach. A questionnaire was applied to 288 students of "Nicolae Bălcescu" Land Forces Academy from Sibiu, Romania. The results of the research revealed that students pointed out the difficulty of interacting with their teachers, and of developing practical activities. While the opinions of the students were not influenced by their gender, they were influenced by the type of studies followed. Compared to bachelor students, master students were more affected by the changes which took place, and they believed to a higher extent that they possess leadership skills and that they have the necessary knowledge to lead a specific military group.

KEYWORDS

leadership, styles, organizational change, COVID-19 pandemic, higher education

1 Introduction

The COVID-19 pandemic influenced the activity of institutions and organizations from many different fields, one of these institutions being represented by the military academy. In this regard, considering that for a semester the military academies had to carry out their activity with students online, we were interested in analysing the changes that occurred in the educational process of Romanian military academies, in order to provide an overview of the

way such institutions can deal with crisis situations that they encounter. Thus, considering the purpose of our paper, in our study we tried to find answers to the following research question: How were the learning and developing processes of practical skills in army educational institutions influenced by the COVID-19 pandemic?

The professional training of future officers within a military academy is a complex process, having both an academic component and a military training component. Due to the nature of the military officer profession, the practical part of the training is essential and must be supported both by specialized knowledge, and also by numerous hours aimed at perfecting specific military skills. The leadership competence of future officers defines to the greatest extent the purpose of military education. It is reached as a result of acquiring a set of knowledge, skills, attitudes and values provided by the military academy curriculum. The difficult situation created by the pandemic has tested the possibility of remotely forming some essential skills of future officers: practical skills in the field of leadership, combat and military specialty. Through military exercises in the training camp, or role-plays, case studies, projects and other academic assignments communication skills, decision-making abilities, conflict resolution, delegation, the capacity to motivate and inspire others, and these are not exhaustive. Real leadership situations may require different combinations of skills, which can only be experienced in actions and interactions with others, resulting in shaping leadership styles. These skills become leaders' tools for effectively guiding and influencing individuals and teams toward organizational goals. In the long run, it is possible that the training and development of practical skills of military students will suffer.

Leadership is a subject that the military is very passionate about, since in this hierarchical organization each officer has subordinates to lead. Duțu (2008, p. 20) describes military leadership as “the ability to lead a group of individuals beyond what they believe to be their limits.” Furthermore, in order to be effective leaders, students need to develop practical skills such as: communication skills, or conflict resolution skills, and in this regard a study which focuses on the way military students manage to develop their practical skills is important and necessary. The doctrinal approach of the military education and training is based on the idea that leadership competence is not the result of chance, the sum of the innate qualities and personality traits, but can be learned, trained, improved, being the result of developable skills with relational orientation (emotional intelligence, collaboration, and communication). Thus, is emphasized that the cadets could become good military leaders following effective training.

The military leadership process is considered „the lifeblood of an army” (ADP 6-22, 2012, p. 11) and it has some specific characteristics, so that it can only be fully understood through an approach related to the army context. One of the specificities is that, being part of a hierarchically constructed organization, military leaders can access two sources of power in relation to subordinates: formal power, ensured by the position they occupy in the hierarchy, as well as personal power to exercise influence. In this regard, “military leadership is based on a strict hierarchy and execution of orders, and requires the commander to be prepared not only to persuade and inspire, but sometimes to force soldiers to carry out orders by motivating using his/her personal example” (Bekesiene et al., 2021, p. 3) Through this approach, military leadership contradicts the idea that leadership consists in the leader's use of his own influence, which is completely different from wielding the power for dominating others

(Northouse, 2021). Moreover, other authors pay special attention to arguing that the use of coercion is the exact opposite of leadership (Yukl, 2013). The justification for the fact that military leaders use other means to lead their subordinates is based on an essential characteristic of the military organization, that it is important to perform in threatening and dangerous contexts (Baran and Scott, 2010; Campbell et al., 2010).

Military leadership is “the process of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization” (ADP 6-22, 2012, p. 11). Most of the studies related to leadership begin by mentioning the multitude and variety of scientific definitions offered by scholars over time, but also the diversity of attempts to explain the concept as clearly as possible. To illustrate this idea, Winston and Patterson (2006), formulated a very comprehensive definition of leadership, which includes over 90 variables identified following a very broad literature review. By contrast (Summerfield, 2014) insists on the need to provide a definition as simple as possible, consisting of a maximum of three words and reaches the idea that the core function of leadership for an organization is to “make things better.” We find the same brevity with reference to the essence of military leadership, (Ulmer, 2010) stating that “in any Army, in any time, the purpose of leadership is to get the job done.” In the opinion of McCauley (2004), leadership has a significant vocational component, he referred to leadership as “a totality of art, mastery and talent” that is difficult to compress in a brief explanation. The study (Kolenda, 2001), also emphasizes the importance of talent and practical skills, stating that leadership is „the warrior's art.” Therefore, in the preparation of students to become military leaders, special emphasis is placed on practice, on following role-models, on solving practical situations in specific professional contexts.

Depending on the type of influence exercised by the persons concerned, military leadership is analysed in the literature from two points of view: direct influence of the leader (face to face, with immediate effects on the motivation, mental state, and behavior of subordinates) and indirect influence of the leader (mediated through the changes intentionally brought by the leader to the tasks, the group, the organizational environment, etc.). In other words, “military leadership is obviously about influencing people, but it is also about shaping the task environment” (Gouvernement of Canada, 2005, p. 6).

Among the leadership theories, models and styles circulated in the literature, it can be stated that transactional leadership and transformational leadership are most often studied within the military organization (Atwater and Yammarinol, 1993; Ivey and Kline, 2010; Martinez-Corcoles and Spephanou, 2017). Broadly analysing the characteristics of the transactional leadership, Burns (1978) and Bass (1985) found that it is focused on providing incentives (rewards, such as bonuses, promotions or punishments, such as reprimands, demotions) to motivate followers to achieve specific goals and to meet certain performance expectations. This type of leaders identify people's needs and reward them for satisfying those needs so that they perform better (Thanh and Quang, 2021). Transactional leadership is often contrasted with the transformational leadership (Deluga, 1988), which focuses on inspiring and empowering followers to achieve their full potential and work toward a common vision. Practicing transformational leadership, leaders actively create changes in awareness, attitudes, and behaviors in themselves, becoming attractive role models to create cognitive change, behaviors, attitudes, and even

value orientations in employees (Bass, 1985; Thanh and Quang, 2021). Transformational leaders believe in their followers, are change agents and make a lot of effort to improving the working capacity of the organization members, often creating learning opportunities. Thus, the military organization can cope with complexity as well as being very proactive in building an atmosphere of job satisfaction and engagement to leadership performance (Agarwal and Gupta, 2021).

In this respect, there are many empirical studies, some older but other even recent, concluding that the transactional leadership has a significant and positive impact on the followers performance (Reicher et al., 2005; Raveendran, 2021; Thanh and Quang, 2021), and also the transformational leadership has positive outcomes (Khan et al., 2020; Bakker et al., 2022).

Whereas the concept of leadership implies the existence of two entities, the leader and the followers, the clarification of the phenomenon necessarily comes with contributions from both directions, both with leader issues and with follower issues. The professional training of future officers within and (3) the actional dimension, referring to the most suitable behaviors and attitudes to exert influence on a group of people. In terms of group process approaches, leadership is a relational property of groups (Hogg, 2001) and “a process of social influence through which an individual enlists and mobilizes the aid of others in the attainment of a collective goal” (Chemers, 2001, p. 376). This approach supports the idea that the essence of leadership is not the leader as a person, but the psychosocial phenomena that occur among followers under the influence of the leader (Reicher et al., 2005; Haslam et al., 2020). Thus, leadership is not only seen as a process of top-down influence, but as a “reciprocal relationship in which leaders and followers mutually influence each other” (Martin et al., 2010). As a transformational process, leadership means “to influence followers to achieve more than is usually expected of them” (Bekesiene et al., 2021, p. 2).

Regarding the third, above mentioned dimension, actional leadership is very suitable for the military leaders at the tactical level, as far as it describes what a leader has to do: accomplish the task/mission, build and maintain the team and develop the individuals (Adair, 1973).

From the teaching staff point of view, the findings of a study conducted by Channing (2020) [31] show that leadership can be taught, being a teachable skill. Trainers consider that “leadership can be learned through attending classes and workshops, pursuing degrees, being mentored by seasoned leaders, gaining on-the-job experience, and participating in leadership degree and development programs” (Channing, 2020, p. 141). In terms of the best ways to develop leadership skills, practical training was firstly mentioned (“Leaders learn by doing—making mistakes and learning from them is a powerful experience”) and secondly being mentored by a more experienced person.

To conclude, in the process of forming and developing practical leadership skills, through military exercises in the training camp, or role-plays, case studies, projects and other academic assignments, the face-to-face relationship between the trainers and the trainees is very important, and the changes imposed by the COVID-19 pandemic have certainly influenced the educational process.

The pandemic has compelled higher education institutions, including military ones, to transform their approach to distance learning, leading to the emergence of a new phenomenon called “crises-military e-learning (cmel)” (Bodziany, 2021). Several studies have been conducted in universities during and after the pandemic

time, aiming to investigate the new features of the educational process, the out comings and also the characteristics of the online teaching and learning. The researchers discovered that for students which previously believed that the blended learning techniques were artificial, the shift to remote learning made contact with classmates and teachers through mediated means to seem more natural and enjoyable (Burke and Ločmele, 2021). Also, students displayed a surprising level of similarity in their comfort levels with methods of distance teaching and learning, despite the generational differences in media and communication technology usage.

Regarding the teachers’ opinion, Mirke and Tzivian (2021) found a statistically significant relationship between the increase of teachers’ digital skills and their attitudes toward new technology, their perceptions and attitudes toward distance teaching, individual and institutional support, student engagement and communication.

Measuring students’ perceived satisfaction regarding multiple aspects of online education (e.g., program organization, instructional clarity, lecturer support, relationship with classmates, group projects, learning outcomes), researchers concluded that students were more resilient than one would have thought, although mentioning as a negative aspect the lack of the face-to-face interaction with their colleagues (Lee et al., 2021). In other research conducted during the pandemic, students also reported positive academic outcomes, but negative social and psychological effects (Lemay et al., 2021). The motivation and some of the students’ learning behaviors, such as persistence and procrastination, were strongly influenced during the pandemic by the level of satisfaction of their basic psychological needs (Pelikan et al., 2021).

Another study, Tsang et al. (2021), discovered that student interaction, course design, and instructor-student dialog were key factors in predicting the effectiveness of online learning during the pandemic. The findings highlighted that the interaction between instructors and students played a crucial role in determining student initiative, and also indicated that university support did not have a significant impact on either perceived learning outcomes or student initiative.

Considering the practical skills development during the pandemic, students have faced challenges in accessing practical resources and gaining skills and experiences relevant to their chosen profession. All fields and disciplines that typically involve hands-on experience, such as laboratory work, internships, physical activities, studies on the ground etc., have been significantly impacted by the restrictions imposed during the pandemic. Regarding the training and development of students’ practical skills, contrary to what one might think, research indicates that students from the technical field were not more affected than those from the humanities field. “Both profiles are equally affected by the context of the online education, the acquisition of practical skills being dependent on objective factors which vary in different forms, relatively to the specifics of the practice context” (Popescu, 2021, p. 23).

Likewise, a study conducted in the pandemic by Elhaty et al. (2020) shows that a large percentage of students consider that the online education negatively affected the development of their practical skills, “the main concern for students being the possible impact of poor practical practices on their future career opportunities” (p. 2867). In the medical field, the authors of a study aiming to evaluate the impact of virtual skills training on students’ knowledge, attitude, and practice, as well as their satisfaction with virtual learning, concluded that “online learning could be an

alternative approach on improving student's knowledge and practice toward medical skills" (Visuddho et al., 2023, p. 1). The results indicated that the scores for knowledge and practical skills among the online group of students were significantly higher, while the scores for the students' attitudes and satisfaction were substantially lower compared to the control group.

In terms of military education and training during the pandemic (Keys, 2021; Keys et al., 2022) conducted quantitative and qualitative studies regarding the American instructors' sense of efficacy during the online preparation of Air Forces warfighters for their future leadership roles. Overall, the above-mentioned studies concluded that instructors felt confident in their abilities to teach online, despite not having received preservice or in-service training specific to online teaching and learning.

The results of a study carried out on Polish officer cadets showed that one of the effects of the epidemic is an increase of the learning efficiency (Wielgosik and Marchlewski, 2022). At the same time, concerning the development of practical skills, cadets consider that the educational objectives for exercises and laboratories were not completely achieved through the implementation of remote learning. The findings of this study indicated that the efficiency of the lectures was assessed as being twice as high as the efficiency of laboratories.

In addition to the above-mentioned findings, related to education in various professional domains during the pandemic, the focus of the present paper is on the forming process of future military officers, more specifically the development through online education of their practical leadership skills (communication, decision-making, conflict resolution, and delegation, the capacity to motivate and inspire others). In the Romanian Land Forces Academy, the online education took place through the Moodle platform, which had been installed before the pandemic, but had not been used to its full capacity until then. It can be stated that online interactions between teachers and students during the pandemic were supported by a high-performance digital infrastructure.

2 Materials and methods

2.1 Purpose and objectives of the research

The purpose of the research was to analyze how the COVID-19 pandemic influenced the educational process and the leadership activities carried out in a Romanian army academy, in the context in which the practical activities had to be carried out in the online environment. By doing this we attempted to provide an overview of the aspects on which army higher education institutions should focus on in order to carry on their activity in crisis situations.

Related to the purpose stated above, we also formulated a series of objectives, as follows:

- O1. Evaluation of the main changes that the COVID-19 pandemic has produced in terms of teaching and learning.
- O2. Evaluation of the perceived importance of practical activities before and during the pandemic.
- O3. Evaluation of student satisfaction with online study and identification of the problems generated by it.

- O4. Identifying students' opinions about the improvement of the educational process during the pandemic period.

2.2 Hypotheses of the research

Related to the research we formulated the following research hypotheses:

H1: During the pandemic, the main changes adopted in teaching and learning were perceived significantly different by the students according to their gender and form of study.

H2: The perception of the organizational transformational leadership and the self-evaluation of the leadership skills of the students were significantly different according to the gender of the respondents and the type of studies followed.

H3: The evaluation of transformational organizational leadership is correlated with the self-evaluation of leadership skills.

H4: The perception of personal and organizational leadership is significantly different among students who declare that they have the necessary knowledge to lead a specific military formation (platoon) compared to those who declare that they do not have that knowledge.

2.3 Data collection method

The research we conducted was quantitative. In this regard, a questionnaire was applied to all 1,400 university students of "Nicolae Bălcescu" Land Forces Academy, a military higher education institution from Sibiu, Romania. The research was conducted between October and December 2022, the questionnaire was applied online through the help of the Google forms platform. Two reminder sessions were initiated to complete the questionnaires. Voluntary participation was requested for all respondents and the confidentiality of what the respondents declared was guaranteed. No data were collected regarding the respondents' identity, identification data, email addresses and any other personal data. The application of the questionnaires was done in compliance with the rules of internal order of the institution.

2.4 Sample

The sample of the research comprises 288 students of "Nicolae Bălcescu" Land Forces Academy from Sibiu, Romania so the response rate was 20.5%. The structure of the sample is described in Table 1. The results presented in our article were not weighted because we took into account the fact that the population of such educational institutions is relatively homogeneous.

"Nicolae Bălcescu" Land Forces Academy from Sibiu, Romania, is a public higher military education institution that organizes bachelor and master programs. The mission of the institution is to provide training and development for all military branches that belong to the Land Forces domain, and its aim is to build up commissioned officers

and leaders for the Romanian Land Forces. After completing 3-year bachelor programs in academy, graduates become first rank military officers and are assigned to army units. In order to afterwards access higher ranks, officers attend 2-year master's programs in academy, either immediately after graduation or in subsequent years. The sample of the research comprises 288 students in bachelor's and master's programs. Taking into account this information, the study we conducted is important because, if after graduation students become commissioned officers and leaders for the Romanian Land Forces, they will need to have well developed practical skills in order to lead. In this regard, by studying how students developed the activities during the pandemic period we can have an overview of the challenges they have encountered and an overview of the aspects on which the institution should focus on in order to help students develop better practical skills. The sample is not representative, but instead is a convenience sample, meaning that those students who had the desire to answer were included in the study. The structure of the sample is described in [Table 1](#).

2.5 The research instruments

In order to conduct the quantitative study, the research instrument used was the questionnaire. The questionnaire was created by considering two other scales previously developed. The first scale used, The Global Transformational Leadership scale (GTL) developed by [Carless et al. \(2000\)](#) contains seven items, corresponding to seven behaviors considered to be relevant for the transformational leadership. Each of the broad statements that compose the scale represents a compression of some complex behaviors of a leader, as follows: communicates a positive vision, develops staff, provides support, empowers staff, is innovative, leads by example, and is charismatic. According to [Carless et al. \(2000\)](#), the GTL exhibits strong a convergent validity to other measures of transformational leadership, including the Multifactor Leadership Questionnaire (MLQ) and the Leadership Practices Inventory (LPI). The second scale used was the Student Leadership Practices Inventory, a tool validated and successfully used to assess and develop student leadership skills ([Posner and Brodsky, 1992](#); [Lopez, 2013](#)). Respondents are asked to consider how frequently they engage in each of the behaviors using five-point Likert-scales, with 1- indicating rarely and 5- indicating very frequently or almost always. The questionnaire can be seen in [Supplementary Appendix A](#).

TABLE 1 The structure of a sample.

Variables	Categories	Percents
Residency environment	Urban	53%
	Rural	47%
Gender	Male	78.5%
	Female	21.5%
Age category	20–21 years old	52%
	22–23 years old	36%
	Over 24 years old	12%
Studies	Undergraduate studies in progress	60%
	Master studies in progress	40%

2.6 Data analysis

The data collected was analyzed with the program Statistical Package for the Social Sciences (20 version). In our analysis, we included as predictors gender and form of studies. To test the hypotheses, we used: the Chi-Square Test of Independence (for Hypothesis H1), Independent Sample t-test and descriptive statistics for The Leadership Practices Inventory (for Hypothesis H2). The Spearman Correlation and regression analysis (for Hypothesis H3), a non-parametric Mann–Whitney U test (for Hypothesis H4), and Pearson Correlation (for Hypothesis H5).

3 Results

3.1 The army students and the educational process before and during the pandemic

We invited the respondents to specify the first word that they had in mind when they found out about the decision to transfer the educational process to the online environment. The results are presented in [Figure 1](#).

We observed from the results from [Figure 1](#), that the respondents have associated the transfer of the educational process in an online environment with some positive terms: accessibility/comfort/freedom (19.5%), efficiency/economy of resources and time (16%), adaptation on the go/flexibility (14.5%) and so on. However, 18% of respondents associated online education with additional difficulties and we can list some of the mentioned issues: disappointment, disaster, distancing, ineffectiveness, uncertainty, fatigue, and superficiality.

It is important to mention other answers that we consider suggestive. Thus, for some respondents, the transition of the educational process to an online environment brought important gains: greater concentration on the learning process (undergraduate, male, 21 years old) emphasis on personal development (undergraduate, male, 22 years old) emphasis on responsibility (undergraduate, male, 21 years old), obligation to be present as in the face to face activities (master, male, 22 years old).

The answers presented above confirm the fact that there have been certain changes in terms of teaching and learning. Reviewing these changes, the students were asked to rate which would be the most important (in a multiple-choice question). The results are presented in [Table 2](#).

In the last two columns of [Table 2](#), we can read the percentages for the mention of each item, as well as the percentages of the total subjects of the sample. In both columns, the hierarchy is identical, but the way they are understood is different. For example, the item 'the content of the courses was more theoretical' represented 25% of the total student choices, while the same item was indicated by 48% of the students. In other words, to see the proportion of students affected by these changes, it is better to read the second column (per cent of cases). A second change considered important by the students was the fact that 'interaction with teachers and military personnel has become more difficult' (mentioned by 45% of students).

Of course, for the other items, we deduced that the respective changes were strongly felt by the students: the hours of practical training have decreased (mentioned by 35% of students), the limitation of practical part to solving some exercises (mentioned by

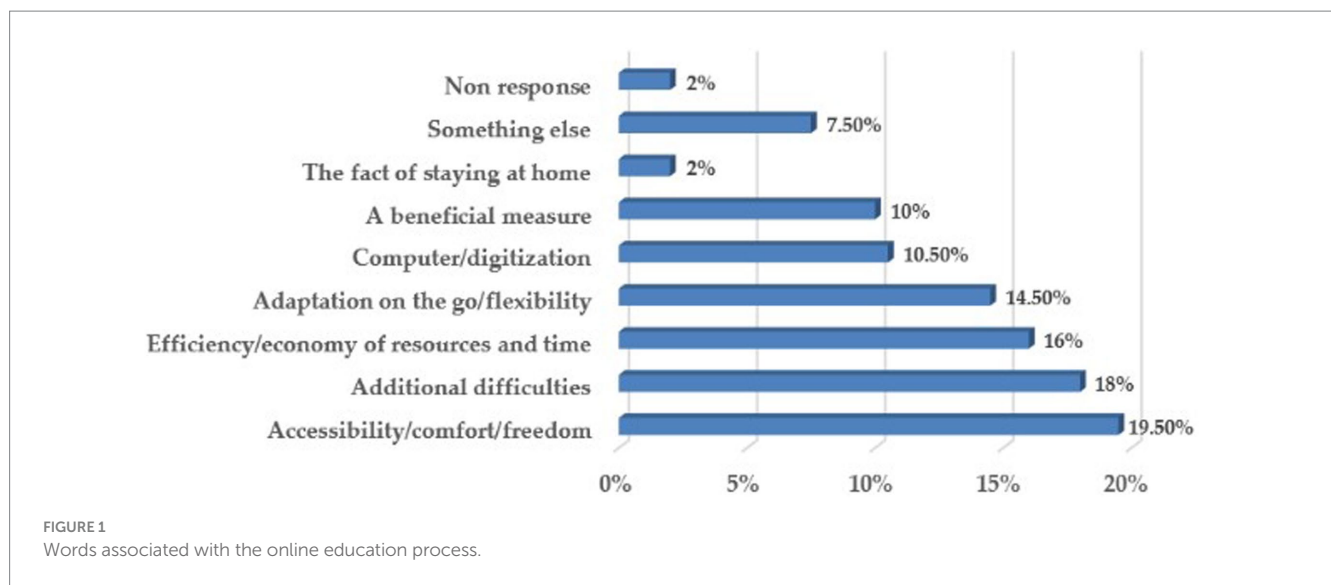


TABLE 2 The main changes that the COVID-19 pandemic has produced in terms of teaching and learning.

	Percent	Percent of cases
The content of the courses was more theoretical	25%	48%
Interaction with teachers and military personnel has become more difficult	24%	45%
The hours of practical training have decreased	18%	35%
The practical part was limited only to solving some exercises	14%	27%
The volume of practical themes was higher	11%	21%
The time for solving the practical themes has decreased	8%	16%
	100%	192%

27% of students), the fact that the volume of practical themes was higher (21%) and the fact that the time for solving the practical themes has decreased' (16%).

Starting from the data from Table 2, we stated the following hypothesis:

H1: During the pandemic, the main changes adopted in teaching and learning were perceived significantly different by the students according to their gender and form of study.

H1a: We analysed the differences by gender with the test of independence (Chi-Square) where the dependent variable was multiple choice. The results of crosstabulation can be seen in the Table 3.

The statistical analysis showed that there are no statistically significant differences regarding the main changes adopted in teaching and learning with the gender of the respondents (Chi Square = 12.39, df = 6, $p = 0.054$): there are no significant differences between men and women regarding the perception of main changes already listed. In this case, our hypothesis was not confirmed.

TABLE 3 Distribution of the perception of main changes by gender.

Main changes	Female	Male
Interaction with teachers and military personnel has become more difficult	52%	44%
The content of the courses was more theoretical	42%	50%
The practical part was limited only to solving some exercises	36%	25%
The hours of practical training have decreased	45%	29%
The volume of practical themes was higher	16%	23%
The time for solving the practical themes has decreased	16%	16%

H1b: To analyse the differences between forms of studies we used the same test of independence (Chi Square) for the same dependent variable. The results of crosstabulation can be seen in the Table 4.

The statistical analysis showed that there are statistically significant differences regarding main changes adopted in teaching and learning with the type of studies (Chi Square = 21.784, df = 6, $p = 0.001$): there are significant differences between the bachelor's and master's students regarding the perception of main changes already listed. In this case, our hypothesis is confirmed.

From Table 4 we observed that bachelor's students were to a greater extent marked by difficult interaction with teachers and military personnel in comparison with the master's students (53% vs. 34%); the same situation was in the case of evaluation that 'the hours of practical training have decreased' (35% vs. 29%). In other cases the master's students were to a greater extent marked by the fact that 'the content of the courses became more theoretical' (54% vs. 45%) or for the fact that 'the time for solving the practical themes has decreased' (23% vs. 11%). All these evaluations can be extremely important for academics who can regulate a whole series of negative aspects that appeared in a pandemic context, in a field directly related to national security. Finally, we conclude that hypothesis H1 was partially confirmed.

All the clarifications up to now can bring into discussion an important issue: to what extent educational organizations that

TABLE 4 Distribution of the perception of main changes by type of studies.

Main changes	Undergraduate studies in progress	Master studies in progress
Interaction with teachers and military personnel has become more difficult	53%	34%
The content of the courses was more theoretical	45%	54%
The practical part was limited only to solving some exercises	26%	29%
The hours of practical training have decreased	35%	29%
The volume of practical themes was higher	21%	21%
The time for solving the practical themes has decreased	11%	23%

support national defence and security system and which put emphasis on practice/practical applications can adapt to such pandemic crises?

Students recognized the importance of practical activities for their formation: 92% of them stated that practical training is important to a large/very large and extremely large extent and 88% declared that lack of practical activities can affect their professional development. Unfortunately, just 55% of the students declared to a great and very great extent that the activities in the military training could be adapted to this kind of crisis and just 27% consider that the pandemic context may be an opportunity for professional development. The results are presented in Table 5.

Table 5 reflects a critical point of view from a part of the students and the general background is that during the pandemic the educational activities in these kinds of institutions became problematic. Next, we focused on the adaptation to the pandemic situation from what was already realized on two levels: the online transfer of markedly theoretical activities and the diversification of practical activities with the minimization of the risks generated by COVID-19. First of all, students' satisfaction with the new online strategies is presented in Table 6.

From Table 6 we can observe that the opinions regarding the effectiveness of online activities were divided: 46% of student were dissatisfied and only 42% of students were satisfied with the online activities.

Next, considering the practical activities, it was natural to compare two periods: before and during the pandemic. Given the pre-pandemic period, the practical activities identified are presented in Table 7.

Of course, many of these kinds of activities could not be developed during the pandemic, and for this reason, we decided to identify the activities which were proposed to students during the pandemic. The practical activities proposed can be seen in Table 8.

The results from Table 8 show that the dominant practical activities were 'military training activities in training camps' (64%) and 'sports activities' (55%) both of which can be assumed to guarantee compliance with social distance and other restrictions specific to the pandemic period.

3.2 Evaluation of organizational and personal leadership

Within the military educational organizations in the field of national defense and security, predictably, the students' relationship with the officers in charge with military training is at the same time a relationship of strict subordination on military lines but also an open

relationship of collaboration (specific to educational activities). In this context, the type of leadership imposed by officer-teachers becomes extremely important. To evaluate leadership, we used in question q11 *The Global Transformational Leadership Scale* (Carless et al., 2000) [46]. The descriptive values of *The Global Transformational Leadership Scale* for our sample can be seen in Table 9.

From the results from Table 9 we observe the negative values of Skewness (indicating that the distribution was left-skewed for all seven items) and Kurtosis (a negative kurtosis indicates that the distribution is flatter than a normal curve). Applying the Kolmogorov-Smirnov normality test we reject the null hypothesis of normal population distribution (in all cases was $p < 0.05$). Starting from the data from Table 9, we formulated the following hypothesis:

H2: The perception of the organizational transformational leadership and the self-evaluation of the leadership skills of the students were significantly different according to the gender of the respondents and the type of studies followed.

We decomposed this hypothesis into four sub-hypotheses:

H2a: The perception of organizational transformational leadership is significantly different according to the gender of the respondents.

The results generated by the data analysis are presented in Table 10.

Considering the results from Table 10, differences according to gender regarding perceived leadership were determined by using a parametric Independent Sample *t*-test. No significant differences between genders were found for all seven items. The hypothesis was not confirmed.

H2b: The perception of organizational leadership is significantly different according to the type of studies followed.

The results generated by the data analysis are presented in Table 11.

Taking into account the results from Table 11, using an Independent Sample *t*-test we observed significant differences regarding the perception of organizational leadership according to the type of studies followed. From the data obtained, we deduced that all the seven dimensions of organizational leadership are valued to a greater extent by those studying for a master's degree. The proximity to the completion of the master's studies and the fact that master students are active military officers may contribute to a more pronounced perception of organizational leadership.

TABLE 5 Opinions about the importance of practical activities and adaptation to the pandemic.

Percentages of those who declaredto a small and very small extent	...neither largely nor to a small extent	...to a great and very great extent
(Q8) 8. On a scale of 1 to 7, to what extent do you consider that practical training is fundamental to your professional development?	2%	6%	92%
(Q18) To what extent do you consider that the lack of practical activities in the military environment during the pandemic has affected your professional development?	6%	6%	88%
(Q7) To what extent do you consider that the activities in the military training component could be adapted to the situation created by the pandemic?	23%	22%	55%
(Q21). To what extent do you consider that the situation generated by the pandemic may be an opportunity for professional development in the military field?	36%	37%	27%

TABLE 6 Satisfaction with online activities.

Percentages of those who declaredfrom extremely dissatisfied to quite dissatisfied	... neither satisfied nor dissatisfied	...from quite satisfied to extremely satisfied
(Q9) How pleased are you with how the online teaching-learning process has unfolded in the academy?	46%	11%	42%

TABLE 7 Main practical activities in pre-pandemic (q3).

	Percents
To do internships in different military units in the country	58%
To participate in practical activities within the military training modules	32%
To practice in various military units outside the country	37%
Interact with various specialists in the field	26%
To constantly receive professional advice from military personnel	8%

TABLE 8 Practical activities proposed to students.

Activities related to the educational formation (Q6)	Percents
- Internships in military units	20%
- Military training activities in training camps	64%
- Practice at the command of the platoon	11%
- Something else	4%
Extracurricular activities proposed to students (Q5)	
- Volunteering activities within NGOs	6%
- Sport activities	55%
- Participation in cultural and social projects	32%
- Something else	7%

For the self-evaluation of leadership skills, we used The Student Leadership Practices Inventory (S-LPI). This complex scale included 30 self-assessment statements regrouped in five practices of exemplary

leadership: Model the way; Inspire a shared vision; Challenge the process; Enable others to act; and Encourage the heart. For our sample, the descriptive values for LPI are mentioned in Table 12. All the five sub-scale of The Student Leadership Practices Inventory (S-LPI) has good reliability: Model the way (Alpha Cronbach =0.849 > 0.700), Inspire a shared vision (Alpha Cronbach =0.867 > 0.700), Challenge the process (Alpha Cronbach =0.869 > 0.700), Enable others to act (Alpha Cronbach =0.851 > 0.700) and Encourage the heart (Alpha Cronbach =0.877 > 0.700). for all the five subscale we applied a Principal Components Factor Analysis and we obtainn reliable factor analysis. The results delivered in every case a single factor with eigenvalue = 3.43 > 1, 57.3% of the variance explained (Model the way), eigenvalue = 3.64 > 1, 60.5% of the variance explained (Inspire a shared vision), eigenvalue = 3.64 > 1, 60.7% of the variance explained (Challenge the process), eigenvalue = 3.48 > 1, 58% of the variance explained (Enable others to act) and eigenvalue = 3.75 > 1, 62.6% of the variance explained (Encourage the heart).

From Table 12 we observe the negative values of Skewness (indicating that the distributions were left-skewed for all five items) and Kurtosis (a positive kurtosis indicating that the distribution was more heavy-tailed compared to the normal distribution in all cases). Using the Kolmogorov Smirnov normality test we reject the null hypothesis of normal population distribution (in all cases was $p < 0.05$). Starting from the data in Table 11 we formulated the following hypothesis:

H2c: The self-evaluation of the leadership skills of the students is significantly different according to the gender of the respondents.

The gender-differentiated analysis is presented in Table 13. Considering the data from Table 13, differences among genders regarding self-evaluation leadership skills were determined by using an Independent Sample t-test. No significant differences between genders were found in the case of all five items. The hypothesis is not confirmed.

H2d: The self-evaluation of the leadership skills of the students is significantly different according to the type of studies.

The analysis of students' self - evaluation regarding their leadership skills according to the type of studies is presented in Table 14.

TABLE 9 The seven items of the global transformational leadership scale.

My team leader...	Mean	Std. deviation	Skewness	Kurtosis
1. Communicates a clear and positive vision of the future	3.31	1.12	-0.375	-1.015
2. Treats staff as individuals, supports and encourages their development	3.51	1.22	-0.511	-0.888
3. Gives encouragement and recognition to staff	3.31	1.24	-0.457	-0.919
4. Fosters trust, involvement and cooperation among team members	3.48	1.23	-0.541	-0.738
5. Encourages thinking about problems in new ways and questions assumptions	3.25	1.27	-0.369	-0.944
6. Is clear about his/her values and practices what he/she preaches	3.53	1.19	-0.680	-0.512
7. Instills pride and respect in others and inspires me by being highly competent	3.40	1.37	-0.508	-1.038

TABLE 10 The seven items of GTL evaluated by the gender of the respondents.

My team leader...	Gender				t	p
	Male (226)		Female (62)			
	Mean	SD	Mean	SD		
1. Communicate/express a clear and positive vision of the future	3.33	1.01	3.22	1.15	-0.682	0.496
2. Treat employees as individuals, support them and encourage their development	3.46	1.21	3.67	1.26	1.186	0.237
3. Gives encouragement and recognition to staff	3.34	1.22	3.19	1.29	-0.852	0.395
4. Fosters trust, involvement and cooperation among team members	3.51	1.17	3.38	1.44	-0.713	0.476
5. Encourages thinking about problems in new ways and questions assumptions	3.29	1.26	3.12	1.29	-0.895	0.372
6. Is clear about his/her values and practices which he/she preaches	3.52	1.55	3.58	1.32	0.342	0.733
7. Instills pride and respect in others and inspires me by being highly competent	3.45	1.36	3.25	1.40	-0.981	0.327

TABLE 11 The seven items of GTL assessed by the type of studies followed.

My team leader...	Studies in progress				t	p
	Undergraduates (172)		Master (116)			
	Mean	SD	Mean	SD		
1. Communicate/express a clear and positive vision of the future	3.11	1.13	3.60	1.05	-3.724	0.000
2. Treat employees as individuals, support them and encourage their development	3.31	1.24	3.81	1.14	-3.489	0.001
3. Gives encouragement and recognition to staff	3.15	1.18	3.55	1.28	-2.717	0.007
4. Fosters trust, involvement and cooperation among team members	3.32	1.18	3.72	1.26	-2.721	0.007
5. Encourages thinking about problems in new ways and questions assumptions	3.08	1.29	3.51	1.99	-2.893	0.004
6. Is clear about his/her values and practices which he/she preaches	3.37	1.17	3.77	1.18	-2.885	0.005
7. Instills pride and respect in others and inspires me by being highly competent	3.19	1.36	3.72	1.32	-3.242	0.001

Considering the results from Table 14, using an Independent Sample t-test we observed significant differences regarding the self-evaluation of leadership skills according to the type of studies followed for all five items but the fourth item (Enable others) made an exception ($p = 0.06 > 0.05$). The hypothesis is partially confirmed.

H3: The evaluation of transformational organizational leadership is correlated with the self-evaluation of leadership skills.

To test the third hypothesis, we constructed two indexes that sum up the seven items from the GTL and the five dimensions from the

LPI. The descriptive analysis of the data of the two statistical indices is presented in Table 15.

The correlation analysis is presented in Table 16.

Calculating the Spearman correlation coefficient (ρ) for the variables (organizational leadership and personal leadership) we deduced that the correlation although statistically significant is strong: $\rho(288) = 0.882, p = 0.000$. The results consistently showed that the more frequently a person engaged in the LPI behaviors, the greater the likelihood of the person to identify himself with the organizational leadership. The correlation relationship between the two variables cannot be interpreted as a cause-effect relationship and for this reason,

TABLE 12 The five items of LPI.

	Minimum	Maximum	Mean	Std. deviation	Skewness	Kurtosis
Model_the_way	10.00	30.00	23.0694	4.00636	-0.845	0.993
Inspired	11.00	30.00	22.8472	4.22094	-0.729	0.448
Challenge	10.00	30.00	22.8542	4.14202	-0.748	0.764
Enable_others	11.00	30.00	23.5278	4.10989	-1.031	1.158
Encourage	12.00	30.00	23.9097	4.06723	-0.993	0.991

TABLE 13 The self- evaluation of the leadership skills of students according to gender.

	Gender					
	Male (226)		Female (62)		t	p
	Mean	SD	Mean	SD		
Model_the_way	23.14	4.16	22.80	3.39	-0.583	0.560
Inspired	22.98	4.42	22.35	3.34	-1.037	0.301
Challenge	22.81	4.36	23.00	3.20	0.371	0.711
Enable_others	23.43	4.30	23.87	3.30	0.742	0.459
Encourage	23.71	4.23	23.87	3.30	1.540	0.125

TABLE 14 The self- evaluation of the leadership skills of students according to the type of studies.

	Studies in progress					
	Undergraduates (172)		Master (116)		t	p
	Mean	SD	Mean	SD		
Model_the_way	22.5233	4.29804	23.8793	3.38836	-2.985	0.003
Inspired	22.3023	4.58084	23.6552	3.48688	-2.841	0.005
Challenge	22.3953	4.56347	23.5345	3.32692	-2.448	0.001
Enable_others	23.1744	4.44904	24.0517	3.50117	-1.867	0.060
Encourage	23.4651	4.54914	24.5690	3.12695	-2.440	0.010

we applied a regression analysis. First of all, we found that the results were statistically significant with $F(1,286) = 1407.5, p < 0.001$. The regression equation was as follows:

$$\text{Organizational leadership} = 1.602 + \text{personal leadership} * 0.223.$$

The value of adjusted R Square was 0.831 which means that 83.1% of the variance of the dependent variable is explained by the variance of the independent variable. After Cohen (1988) the power effect was strong (Table 17).

In conclusion, the dependence of the two variables is strong: the more intense the assessment of personal leadership, the more strongly organizational leadership is evaluated.

The self-evaluation of personal leadership skills can be a premise of the awareness of being able to be the leader of a specific training formation (the platoon). Some of the students consider that they can be the leaders of a platoon, while others are reserved. Is there a

significant difference between these students regarding their assessment of leadership (personal or organizational)? To answer the question, we formulated the following hypothesis:

H4: The perception of personal and organizational leadership is significantly different among students who declare that they have the necessary knowledge to lead a specific military formation (platoon) compared to those who declare that they do not have that knowledge.

The ranks for organizational leadership and personal leadership according to students' perception about their knowledge of conducting a platoon are presented in Table 18.

Next, a Mann-Whitney U test was conducted and observed that the level of evaluation of organizational leadership is superior for the students that declare that they 'have the necessary knowledge to be the leader of a platoon' (mean ranks: 124.08 > 107.19) and the test proved that there is a statistical difference between first and second group ($U = 5,280, z = -1.797, p = 0.05$). Another situation was in the second case: the level of evaluation of personal leadership skills as superior for the students that declared that they 'have the necessary knowledge to be the leader of a platoon' (mean ranks: 122.70 > 109.99) but the test proved that there is not statistical difference between first and second group ($U = 5,498, z = -1.347, p = 0.178$). We observed that there are differences between the two groups but these differences were significant just for organizational leadership. In the first case, the respondents who consider that they can lead an armed structure (platoon) identify to a greater extent with the organizational leadership pattern. The situation of the evaluation of personal leadership skills forces us to recall the desirability effect that can intervene in the evaluation of this kind of leadership. The hypothesis was partially confirmed.

3.3 Students' perception about the way the academy could facilitate the improvement of practical skills during the pandemic

In the context of the methods which the academy could use in order to help students to develop their practical skills during the pandemic, the results of the research showed that most students declared that the academy could offer them the opportunity to do practical activities or internships in specialized units (32.6%). Many students declared that the academy could diversify the military training (14.6%), that it could have pay more attention to the practical activities matter by being more involved (6.3%), that it could offer them personal/professional counseling (5.6%), or that it could be more communicative, understanding and supportive (4.9%) (Table 19).

TABLE 15 The descriptive statistics for organizational and personal leadership.

Descriptive statistics					
	N	Minimum	Maximum	Mean	Std. deviation
Organizational_leadership	288	13.00	35.00	27.5417	4.76467
Personal_leadership	288	56.00	150.00	116.2083	19.45955

TABLE 16 Spearman correlation between organizational leadership and self-evaluation of personal leadership.

Correlations				
			Organizational leadership	Personal leadership
Spearman's rho	Organizational leadership	Correlation coefficient	1.000	0.882**
		Sig. (2-tailed)	.	0.000
		N	288	288
	Personal leadership	Correlation coefficient	0.882**	1.000
		Sig. (2-tailed)	0.000	.
		N	288	288

**Correlation is significant at the 0.01 level (2-tailed).

TABLE 17 Regression analysis for organizational leaderships and personal leadership.

Independent var.	R	R ²	β	b	SE b
Personal leadership	0.912	0.831	0.912*	0.223*	0.006

Dependent variable: organizational_leadership. * $p < 0.001$.

3.4 Summary of the confirmation of hypotheses

H1: During the pandemic, the main changes adopted in teaching and learning were perceived significantly different by the students according to their gender and form of study.

H1a: It was partially confirmed, because the statistical analysis showed that there were statistically significant differences regarding main changes adopted in teaching and learning according to the type of studies, but not according to their gender.

H2: The perception of the organizational transformational leadership and the self-evaluation of the leadership skills of the students were significantly different according to the gender of the respondents and the type of studies followed- the hypothesis was divided in sub-hypotheses.

H2a: The perception of organizational transformational leadership is significantly different according to the gender of the respondents – hypothesis was not confirmed.

H2b: The perception of organizational leadership is significantly different according to the type of studies followed – hypothesis was confirmed.

H2c: The self-evaluation of the leadership skills of the students is significantly different according to the gender of the respondents – hypothesis was not confirmed.

H2d: The self-evaluation of the leadership skills of the students is significantly different according to the type of studies- hypothesis was partially confirmed.

H3: The evaluation of transformational organizational leadership is correlated with the self-evaluation of leadership skills- hypothesis was confirmed.

H4: The perception of personal and organizational leadership is significantly different among students who declare that they have the necessary knowledge to lead a specific military formation (platoon) compared to those who declare that they do not have that knowledge – hypothesis was partially confirmed.

4 Discussion and conclusions

In the context of the pandemic, while the educational process was affected in all types of higher education institutions, the army academies might have faced more challenges due to their inability to carry out face to face practical activities which are necessary for the development of future army workers and army leaders. Thus, as a previous study mentioned (Government of Canada, 2005), the military leadership should be analysed from the perspective of direct influence (face to face activities) and also from the perspective of the indirect influence (represented by changes imposed by the leader or the organizational environment). In this regard, the paper was focused on assessing students' perception about the educational process and the leadership activities from the perspective of the changes which took place within the academy due to the pandemic.

Hence, the purpose of our paper was to analyse how the COVID- 19 pandemic influenced the educational process and the leadership activities carried out in a Romanian armyacademy, in the context in which the practical activities had to be carried out in the online environment. In this regard, through our research we provided an overview of the way army academies could continue their activity in crisis situations. Thus, we were interested in identifying the changes

TABLE 18 Ranks for organizational and personal leadership according to students' perception about their knowledge of conducting a platoon.

Ranks				
Considering the information about military leadership that you received during the online courses, consider rather that:		N	Mean rank	Sum of ranks
Organizational leadership	...you have the necessary knowledge to be the leader of a platoon (first group)	158	124.08	19605.00
	...you do not have the necessary knowledge to be the leader of a platoon (second group)	78	107.19	8361.00
	Total	236		
Personal leadership	...you have the necessary knowledge to be the leader of a platoon (first group)	158	122.70	19387.00
	...you do not have the necessary knowledge to be the leader of a platoon (second group)	78	109.99	8579.00
	Total	236		

TABLE 19 The ways in which the academy could contribute to improving the development of practical skills during the pandemic.

Activities	Percent
Practical activities/internships in specialized units	32.6
Qualitative diversification of military training	14.6
A higher degree of involvement from everyone	6.3
Personal/professional counseling	5.6
More understanding/communication/moral support	4.9
Camps/interactive activities	4.2
Something else	9
I do not know	22.9

that took place in the teaching-learning process, in analysing students' opinion about the importance of practical activities before and during the pandemic, in analysing their satisfaction with the online educational process and in examining students' opinion about the improvement of the educational process during the pandemic. Multiple facets of this topic were also investigated by (Daniela and Visvizi, 2021).

Considering the results of our research referring to the teaching-learning process, most of the students associated the online educational process with positive words such as accessibility/comfort/freedom. From this point of view, our paper is in line with a previous study (Burke and Ločmele, 2021), which stated that transfer from face to face learning to online learning was positively perceived by students. However, many of our respondents also associated the online educational process with additional difficulties. From this point of view, our research is in line with the study of (Lee et al., 2021), which showed that students had a resilient attitude toward online learning.

In terms of changes which occurred during the pandemic, most of the students declared that the content of the courses was mostly theoretical, that interaction with teachers and military personnel has become more difficult, that the hours of practical training and activities decreased or that the practical activities were resumed to solving exercises/tasks. From the perspective of students' opinion about the way the pandemic influenced the way they carried out practical activities, our research is in line with a previous study (Elhaty et al., 2020), which revealed that students believed the pandemic negatively affected the development of practical skills, them being worried about the impact of their lack of practical skills on their career.

Taking into account the factors which could have influenced students' opinions about the changes which took place during the pandemic, the findings of the research showed that while students' opinion did not differ according to gender, it did differ according to the type of studies. In this regard, compared to master students, bachelor students were more affected by the lack of interaction with teachers and military personnel and by the fact that the hours of practical training have decreased. Given the students' opinion about the importance of practical activities, most respondents were aware of the importance of such activities for their professional development. Furthermore, even though the educational process had to be developed online, according to the respondents, the army academy tried to propose a series of practical activities, such as: military training activities in training camps, or internships in military units. In the context of extracurricular activities, the academy mostly recommended students to engage in sport activities.

In terms of students' satisfaction with the online educational process, while some of the respondents were satisfied with it, most of the respondents were dissatisfied with the way the teaching-learning process took place.

In the context of organizational transformational leadership, the results of the research showed that the opinions of students about their leaders did not differ according to their gender, but they did differ depending on the type of study. Thus, masters' students valued to a greater extent the dimensions of organizational leadership, compared to bachelor student. A possible explanation for these results would be that master students are commissioned officers in the army units and thus they could give more value or pay more attention to organizational leaderships and implicitly to the assets of a leader. In the case of personal leaderships, students' self-evaluation of their leadership skills was not influenced by their gender, but it was influenced by the type of studies followed. In this regard, compared to bachelor students, master students believed to a higher extent that they have leadership skills which model the way, inspire, challenge or encourage others.

Furthermore, the findings of the research revealed a statistically significant relationship between organizational and personal leadership, meaning that the more intense the assessment of students' personal leadership, the more strongly they assessed the organizational leadership. In other words, those students who believed they had strong leadership skills and scored higher on the Student Leadership Practices Inventory, also evaluated strongly the organizational leadership dimensions. Even more, the results also showed that those

respondents who were of the opinion that they had the necessary knowledge to lead a platoon, evaluated and offered higher scores to the dimensions of organizational leadership.

Thus, in the context of developing the practical skills of students could have improved the development of practical skills during the pandemic, most of the students declared that the academy could have offered them the opportunity to do internships in military units, to diversify the military training, to be more involved in the development of practical activities or to offer them personal or professional counseling. From this point of view, our research is in line with a previous study (Deshpande, 2021), which revealed that undergraduate military students were of the opinion that more direct support from the academy and its members could positively influence their learning experience. Thus, in the context of developing the practical skills of students, the army academy could focus more on providing internships for students, on providing better military training, on giving students the opportunity to benefit from career counseling and on giving them more practical tasks.

Given the theoretical implications of our paper, the research contributes to the literature on leadership in army academies and to the literature on the changes that took place in the educational process during the COVID-19 pandemic. Given the practical implications of our paper, the results of the research provide an overview of the changes that took place in the educational process conducted in army academy during the pandemic, and overview of students' opinion about organizational and personal leadership, and they could be further used as a frame of reference by other army academies in the event of dealing with crisis situations. Considering the implications of our findings to the military educational field, by presenting an overview of the changes that took place during the pandemic in an army educational institution, our paper could offer such institutions insights about the aspects that they should focus more within the educational process of students (aspects such as practical activities), and about the aspects that they should take into account in the context of crisis situation such as the one created by the COVID-19 pandemic. Furthermore, the students' answers (presented in Table 19) draw attention to the fact that a series of remedial educational measures are useful post-pandemic, such as practical activities (real or simulated military exercises, leadership at the platoons level etc.) or even additional internships in military units, to compensate for the insufficient development of students' practical skills during the pandemic. Some of the students have not yet completed their professional training process and can benefit from such measures even now, since they returned to the academy after graduation, as students in the master's programs. Next, considering the implications of our findings with regards to educational pedagogy at military academies, the results of the study showed that military and civilian teachers should be more aware of the strong impact their professional attitude can have on students in situations of crisis and uncertainty. Students expected from them deep and creative educational involvement, flexibility, permanent interaction, open attitude, and moral support. It is of course challenging for educators to be an example of professionalism in such situations and to come up with new and effective pedagogical solutions, especially in the military environment characterized by rigidity and excessive regulation. Therefore, one of the important lessons of the pandemic regarding military pedagogy could be the fact that greater creativity, openness, interaction and initiative in

times of normality can support greater adaptability and educational efficiency in crisis situations.

4.1 Limitations and future research directions

Considering the limitations of the research, one limitation is represented by the fact that the study was conducted only in Romania. In this regard, a future research could also focus on analysing army academies from other countries, in order to be able to conduct comparative analyses between the way the educational process and the practical activities were influenced by the pandemic. Another limitation is represented by the method used in order to conduct the research, due to the fact that the subject was analysed only from a quantitative perspective. Thus, a future research could examine the subject from a qualitative perspective too, in order to gain more insight about the challenges army students faced during the COVID-19 pandemic. Furthermore, another limitation is represented by the fact that only the opinion of students was analyzed and thus a future research could also take into consideration the opinion of teachers and other representatives of army academies.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary material](#), further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the Council of the Faculty of Military Sciences from "Nicolae Bălcescu" Land Forces Academy from Sibiu (Nr.11 from 22.11.2022). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

MB: Conceptualization, Data curation, Methodology, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. SB: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. GB: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. CC: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. AB: Investigation, Resources, Visualization, Writing – review & editing. AH: Investigation, Resources, Visualization, Writing – review & editing. AN: Data curation, Methodology, Software, Validation, Writing

– original draft, Writing – review & editing. IA: Resources, Visualization, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/feduc.2024.1332850/full#supplementary-material>

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