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STRESS FACTORS AMONG GEOSCIENCE STUDENTS AND ACADEMIC COMMUNITY RESPONSES

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Purpose: The purpose of this paper is to investigate stress levels among students in the geoscience academic environment and to formulate practical recommendations for the academic community. The study aims to identify key stressors, symptoms, and coping strategies among students.
Design/methodology/approach: A quantitative research approach was adopted, utilizing a survey conducted in 2024 with students from the Faculty of Geoengineering, Mining, and Geology at Wrocław University of Science and Technology. The research was preceded by a literature review, and the data were analyzed to identify trends and propose interventions.
Findings: The research identified academic demands-exams, presentations, and project deadlines-as the primary sources of stress. Students reported symptoms such as decreased motivation and health disturbances. Awareness of psychological support services was noted as increasing, yet their utilization remains limited. The findings support the need for systemic changes to reduce student stress.
Research limitations/implications: The study is limited to one faculty within a single institution, which may affect the generalizability of results. Further research could involve broader student populations and longitudinal analysis.
Practical implications: The results highlight the need for improved access to and promotion of psychological support services, as well as the development of stress-reducing academic practices. Institutions should implement regular monitoring and tailored interventions to support students' mental well-being.
Social implications: Reducing academic stress contributes to better student quality of life and may positively influence the university's social responsibility by fostering a healthier educational environment.
Originality/value: This study provides updated data on student stress in a technical university setting and proposes targeted strategies to address it. It is valuable for academic administrators, student advisors, and policymakers.
Keywords: student stress, higher education, psychological support, academic environment, geoscience education.
Category of the paper: Research paper.

1. Introduction

Stress is the body's response to external stimuli that exceed an individual's ability to cope effectively (Selye, 1976). Hans Selye, the creator of the stress concept, defined it as "the non-specific neuroendocrine response of the body" (Rochette, Vergely, 2017). Meanwhile, Lazarus and Folkman (1984) described stress as a transactional process between a person and the environment, occurring when an individual perceives environmental demands as threatening to their resources or well-being.

Student well-being is understood as encompassing positive emotions, the absence of negative emotions, relationships, engagement, accomplishment, purpose at school, intrapersonal or internal factors, and contextual or external factors (Hossain, O'Neill, Strnadová, 2023). Khatri et al. (2024) define student well-being as the physical, psychological, and social wellness of students – elements increasingly at risk in the high-pressure environment of higher education.

Stress is one of the most prevalent factors in the academic environment, significantly affecting students' mental, physical, and social health (Barbayannis et al., 2022; Córdova Olivera et al., 2023; Di Mario et al., 2024; Lee, Park, Kim, 2024). In the academic context, stress should be understood as high levels of anxiety, sadness, burnout, and psychological discomfort (Di Mario et al., 2024) or a physiological, emotional, cognitive, and behavioral activation response to stimuli and academic events (Barbayannis et al., 2022). According to Córdova Olivera et al. (2023), stress can also be defined as a ubiquitous phenomenon in daily life that results from a natural physiological and psychological response of the body to situations perceived as challenging or threatening, acting as a catalyst to confront and resolve problems. Increasing educational demands, performance pressure, and the need to balance studying with other responsibilities make stress a growing concern among students. Numerous studies, including those by Buwalda et al. (2005), Schneider et al. (2005), Dhabhar (2014), Lee et al. (2024), Nevado et al. (2024), and Wang et al. (2025), indicate the negative effects of chronic stress, such as emotional disorders, declining academic performance, and an increased risk of health problems (Buwalda et al., 2005; Schneider et al., 2005; Dhabhar, 2014; Lee et al., 2024; Nevado et al., 2024; Wang et al., 2025).

According to the guidelines of the European Agency for Safety and Health at Work (EU-OSHA, 2024), psychosocial hazards, such as excessive workload, conflicting demands, or a lack of role clarity, can lead to health problems and a reduced quality of life. In the academic context, students often experience similar challenges (Zięba, Król, Nowak-Starz, 2018; Matteau et al., 2022; Pilch et al., 2023), highlighting the need to analyze these factors within the educational environment.

Moreover, the Regulation of the Polish Minister of Science and Higher Education of October 30, 2018, on ensuring safe and hygienic working and learning conditions at universities imposes an obligation on rectors to analyze and identify health and life hazards and to take preventive measures to mitigate these risks. Therefore, understanding the sources of stress among students is crucial for implementing effective preventive measures. A similar situation exists, for example, in Norway, where universities are subject to the Act on Health and Environment in Schools, Kindergartens, and Further Education Programs (Lov Om Arbeidsmiljø, Arbeidstid Og Stillingsvern Mv., 2005) or in Germany, where workplace safety is regulated by the Occupational Safety Act (ArbSchG, 2024).

The aim of this study was to conduct a detailed analysis of stress levels among students of the Faculty of Geoengineering, Mining, and Geology at Wrocław University of Science and Technology (WUST), one of the 14 faculties at the university. This faculty was selected due to the thesis writing requirement for one of the programs offered there. The study focused on identifying the main stress-inducing factors, the most common symptoms, and the strategies used to cope with emotional tension. Furthermore, the collected data allowed for identifying areas requiring intervention to improve student well-being.

The conducted study not only provides insight into the specifics of stress in the academic context but also indicates potential directions for the university's efforts to support students' psychological and organizational well-being. Additionally, an analysis of the current mental support available for students and university staff was carried out, and recommendations were proposed that could be implemented to improve the comfort and well-being of the academic community. To clarify the scope of the study, the following research questions were formulated:

- What are the main stressors affecting students of Geoscience?
- What stress-coping strategies are most commonly used by students?
- To what extent do students make use of the psychological support services available at the university?

These questions guided the development of the survey and the analysis of the collected data.

2. Methods

The research methodology was based on the following methods: literature analysis, definition of the research problem, survey (selection of the survey format and sample group), data analysis (qualitative data), and formulation of recommendations. The study was conducted using an original survey directed at students of the Faculty of Geoengineering, Mining, and Geology at Wrocław University of Science and Technology (WUST) (see Attachment 1). As a student of this department for several years, the author was closely familiar with the academic environment, challenges, and expectations experienced by the student community.

This direct experience provided valuable insight into the context of the study and allowed for more effective design and implementation of the research. The survey was anonymous and consisted of 38 closed- and open-ended questions, designed to assess the main sources of stress, its symptoms, its impact on students' lives, and strategies for coping with emotional tension. The questions also addressed specific aspects of studying, such as the type of courses, forms of assessment, and relationships with lecturers.

The questions in the survey were divided into several categories:

- Frequency of stress occurrence, e.g., "How often do you find yourself in a stressful situation?".
- Sources of stress, including studies, family life, finances, or work.
- The most stressful aspects of studying, such as subject groups, forms of assessments, and relationships with course leaders.
- The impact of stress on behavior and health, with questions about somatic and psychological symptoms, such as headaches, insomnia, decreased concentration, or general discomfort.
- Coping strategies for stress, including support from others, use of stimulants, or seeking psychological help.
- Awareness of available support options at the university, asking about knowledge and use of free psychological assistance offered by the university.

To obtain reliable data, the survey was distributed online through the Dean's Office to all students of the faculty using the university's domain accounts “@student.pwr.edu.pl”. A total of 166 respondents participated in the study, accounting for almost 25% of all students in the faculty. However, two surveys were rejected due to technical issues. The responses to the open-ended questions indicated a lack of seriousness regarding the topic and a dismissive approach to the effort put into conducting the research. The respondents included both women and men from different study programs and years of study within the faculty. Responses were collected anonymously. The data collection process took place from May 16 to May 23, 2024, including weekends. The study was designed to address three core research questions: (1) identification of the main causes of stress among Geoscience students, (2) recognition of the most commonly used coping strategies, and (3) evaluation of the extent to which students utilize available psychological support services. These questions structured both the formulation of survey items and the organization of the subsequent data analysis.

3. Results

A total of 164 students from the Mining and Geoscience programs at our Faculty at Wrocław University of Science and Technology (WUST) completed the questionnaires properly, allowing them to participate in the survey. The number of respondents was similar to the number of graduates from the faculty in recent years (Yikealo, Gebregergis, Karvinen, 2018). A larger proportion of the respondents were women (99 individuals) compared to men (65 individuals), with 47% of them living in cities with populations over 100,000, and 25% residing in rural areas. The largest group in the study consisted of students from the "Geodesy and Cartography" program (37.8%), followed by Geoinformatics (22%) and Mining and Geology (21.3%). The smallest number of surveys were completed by students from the "Geoenergy Engineering" and "Raw Materials Engineering" programs – 4.3% and 3.7%, respectively.

The survey revealed that studying at our Faculty is a source of stress for over 90% of the students. For 76% of the respondents, studies were the most important stress factor. Other choices are shown on the crosstabulation (Table 1).

Tabela 1.
A cross-tabulation showing the distribution of responses to the question about the most common stress-causing factor among women and men

	studies	financial situation	relationship	family members	separation from family	work	other
woman	77 (47%)	4 (2,4%)	2 (1,2%)	2 (1,2%)	0	6 (3,7%)	8 (4,9%)
man	47 (28,7%)	5 (3%)	4 (2,4%)	1 (0,6%)	0	4 (2,4%)	4 (2,4%)

Regular stressful situations were experienced by 43% of the respondents, who reported these situations occurring several times a week. A the crosstabulation shows the distribution of responses among men and women (Table 2). The greatest stress among the respondents was caused by exams, colloquia, assessments, and presentations in front of a group. Among the subject groups, the most stressful were mathematics courses, such as mathematical analysis or statistics, which 46% of respondents reported having difficulties with. Furthermore, stress led to neglecting academic duties, with 45% of students admitting to skipping classes due to stress.

Table 2.
A cross-tabulation showing the distribution of responses to the question about the frequency of stress among men and women

	few times a day	every day	few times a week	every week	less than once a week
woman	28 (17,1%)	18 (11%)	41 (25%)	7 (4,3%)	5 (3%)
man	15 (9,1%)	7 (4,3%)	29 (17,7%)	6 (3,7%)	8 (4,9%)

The forms of assessments also influenced the level of stress. The most stressful form was the oral exam, which was indicated by 72% of respondents. Participants admitted that stress often led to a decrease in motivation, with 62% of students reporting this experience.

Stress also affected interpersonal relationships. As many as 85% of respondents acknowledged that stress caused conflicts with other students. At the same time, 65% of students noted that stress positively affected their relationships, for example, by strengthening bonds in difficult moments. Regarding student-teacher relationships, most respondents rated them as positive, although 54% of respondents expected more support from the Faculty Administration in coping with stress-related issues.

Stress symptoms were varied, but the most common one was a bad mood, reported by 65% of the respondents. The remaining symptoms were presented in Figure 1 (Fig. 1). In stressful situations, students sought support from friends (65%), family members (61%), and partners (49%). Only 7% of respondents used professional psychological help, despite 65% of respondents being aware of the availability of free psychological support offered by WUST (https://ddo.pwr.edu.pl/en/, 2025).

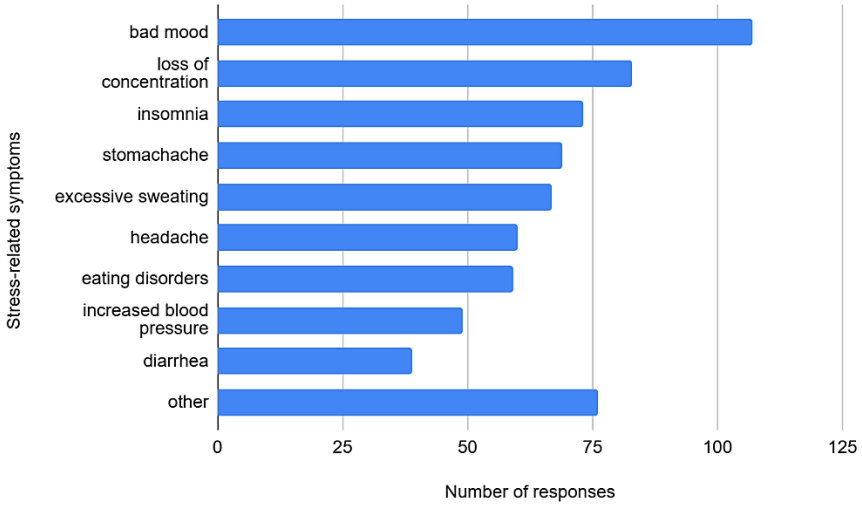

Figure 1. Reported stress-related symptoms and number of responses.

The actions taken by students to cope with stress included entertainment (58%), physical activity (36%), and conversations with loved ones. Among substances, the most commonly used were cigarettes (31%), tranquilizers (26%), and alcohol (25%). Awareness of the negative impact of stress on health was relatively high, with around 80% of respondents agreeing that stress can lead to serious health issues such as depression, heart disease, or hypertension. Despite this, 73% of students consider stress an inseparable part of studying, and 52% believe it can be motivating.

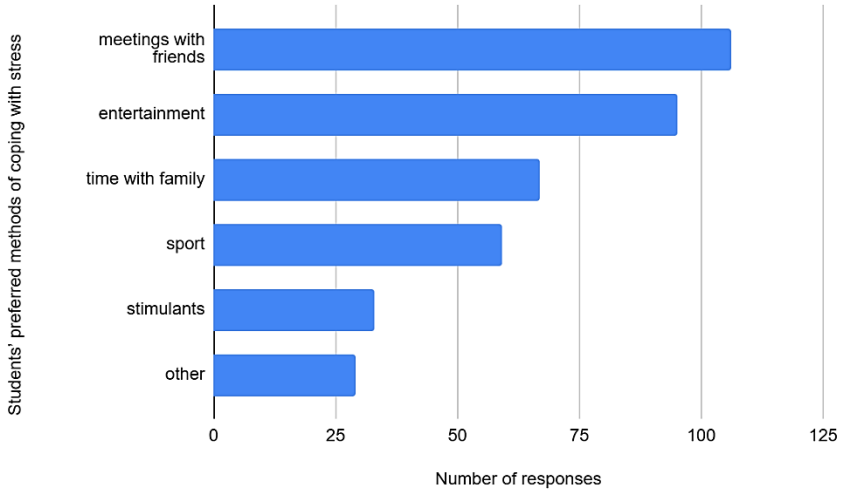

Figure 2. Students' preferred methods of coping with stress.

When it comes to coping strategies, the majority of respondents (65%) prefer meetings with friends, with many also choosing entertainment or time spent with family. This is shown in Figure 2 (Figure 2). Confirmation of these results can also be found in the answers to the question of whom students most often receive support from in stressful situations. More than half of the participants receive support from friends, while slightly fewer receive support from family members (Figure 3).

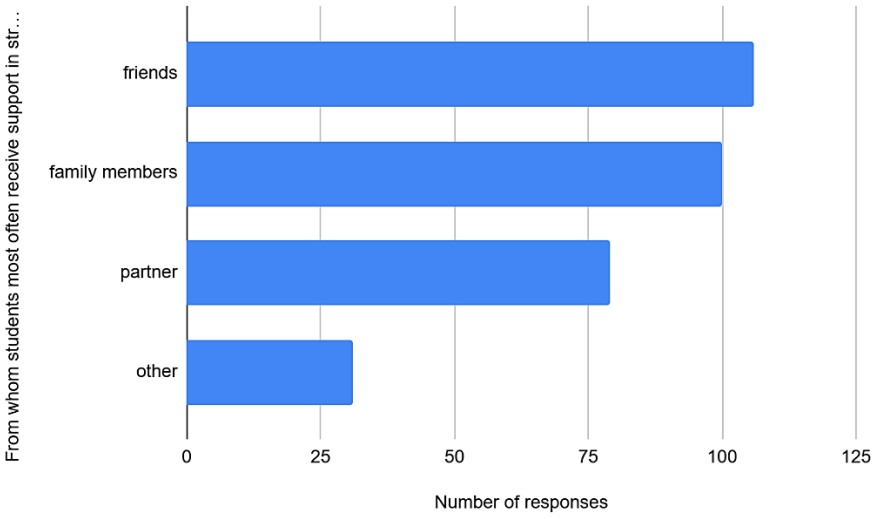

Figure 3. Sources of support for students in stressful situations.

After conducting the survey, several conclusions can be drawn regarding stress-related situations among students. It is important to consider some methodological limitations, such as the selection of the surveyed group from only one department (out of the entire university). Based on these findings, recommendations were made for the academic community to improve conditions and openness toward students, as well as for students to enhance their well-being and mental health. Analyzing the results of the survey, it can be concluded that the availability of psychological support at the university remains underutilized. Although students have access

to free support, very few take advantage of this opportunity. Despite the presence of departments offering support for students from dysfunctional families, minorities, and in various other aspects of life, not all members of the academic community are aware of their existence. A student seeking help will surely find it, but it is important for them to know that it is available.

More efforts should be made to promote the Accessibility Department and the university's "barrier-free" concept at WUST, which is open and friendly to students with disabilities. The Accessibility Department sends recommendations to all academic teachers at the beginning of each semester, asking them to inform students about the university's open-door policy toward those with special needs. This collective information includes messages about free and anonymous psychological support, including in English. Unfortunately, it is unclear how well these recommendations are being implemented by staff and whether they reach students.

Many students are reluctant to seek psychological help, despite 65% being aware of university support, with only 7% using it. This may be due to high demand and limited appointments, suggesting the need for more psychologists and expanded availability. Online sessions, though not ideal, could improve access. Promotional efforts, such as social media campaigns and awareness events, could also encourage more students to seek support.

Students highlighted issues in their interactions with instructors. Expanding student government initiatives, such as field trips and team-building activities, could strengthen these relationships. Verifying faculty compliance with accessibility recommendations would also help. Additionally, fostering student connections through integrative events like academic trips and workshops is crucial, as most respondents rely on friends and family for support.

Another idea would be to create additional workshops focusing on stress management techniques or relaxation practices. These workshops could be held online so that individuals who want to participate do not feel uncomfortable or worried about others discovering their problems or need for support.

Such actions could not only reduce stress but also positively impact academic results and involvement in university life. Ultimately, taking actions aimed at improving students' well-being could significantly reduce stress levels and increase students' satisfaction with their academic life.

4. Discussions

Based on the results of the survey, it is evident that stress remains a significant and widespread issue in the lives of students at the Faculty of Geoengineering, Mining, and Geology at Wrocław University of Science and Technology (WUST). The data indicate that the primary sources of stress are academic factors, such as exams, colloquia, and assessments.

These findings are consistent with those presented by Rana et al. (2019), who identified academic pressure as one of the most prominent stressors in the student population.

This conclusion is further supported by Campbell et al. (2022), whose systematic review of student mental health in the UK highlighted similar stressors – academic workload, performance expectations, and financial pressure – as key contributors to declining student well-being. The alignment between those findings and the results of this study suggests that the academic dimension of stress is a cross-cultural and persistent challenge in higher education.

When comparing the emotional and physical symptoms reported by students, similarities also emerge. In the current study, the most frequently indicated symptoms included poor mood, headaches, and sleep disturbances. These reflect findings from the study by Pilch et al. (2023), where physiological complaints such as fatigue and palpitations were also predominant. Furthermore, both studies observed a strong connection between stress and decreased motivation, which often limits students' ability to meet academic demands effectively.

Zięba et al. (2018) also emphasized the role of exam sessions as the most stressful element of university life, a view supported by the current findings. However, some differences arise when analyzing the academic content areas that generate the most stress. In this study, mathematical subjects (e.g., calculus, statistics) were most frequently identified as the most mentally taxing, whereas Waghachavare et al. (2013) found the greatest levels of stress among students of medicine and dentistry, where academic intensity and competitive expectations were much higher. These differences may be attributed to the nature of the academic programs and their cognitive demands, as well as to cultural or institutional differences in assessment and teaching styles.

An additional perspective is offered by Yikealo et al. (2018), who noted that moderate stress can sometimes be a motivating factor, enhancing academic performance. This nuance is echoed in the current research, where although the majority of respondents associated stress with negative outcomes, over half also acknowledged that it can serve as a motivating factor in certain situations.

Taken together, the results of this study are largely consistent with existing literature, reinforcing the notion that academic pressure is a dominant and transdisciplinary source of student stress. However, the specific nature of stressors and symptoms may vary depending on the institutional context and curriculum. These findings highlight the importance of tailoring support strategies to students' academic profiles and cultural settings. Further studies exploring the influence of organizational factors, course structure, and faculty-student relationships could offer deeper insight into how stress develops and manifests within specific educational environments.

5. Summary

The conducted study confirmed that stress remains a significant challenge among students of the Faculty of Geoengineering, Mining, and Geology at WUST. The most frequently reported sources of stress included academic pressure, exams, and organizational issues, underscoring the need for ongoing monitoring of students' well-being.

From a theoretical perspective, the study adds to the growing body of research on stress in academic environments by confirming previously identified stressors and highlighting the role of student awareness and support systems in managing mental health. Importantly, the study shows that while stress remains prevalent, student awareness of psychological support services has increased compared to earlier findings.

In practical terms, the results underscore the importance of continuing to develop support mechanisms, including expanding access to psychological counseling, organizing stress management workshops, and strengthening relationships between students and academic staff. Regularly repeated surveys could support long-term monitoring of student well-being and inform the refinement of intervention strategies. Implementing these measures can contribute to improved well-being, increased academic engagement, and a healthier university environment – aligned with broader efforts to meet health, accessibility, and inclusion standards on campus.

The results provide clear answers to the study's guiding questions. Academic factors such as exams and project deadlines were identified as the primary sources of stress. Students most frequently coped with stress through informal methods such as talking to friends or engaging in physical activity. While awareness of psychological support services has grown, actual usage remains limited, highlighting the need for further outreach and normalization of mental health support on campus.

Future research in this area could focus on the influence of specific institutional or organizational factors – such as scheduling, assessment types, or faculty-student communication – on student stress. Longitudinal studies would also be valuable in tracking how stress levels and coping strategies evolve over the course of academic programs. Moreover, comparative research across faculties or institutions could help identify effective, scalable practices for reducing stress in diverse academic environments.

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Appendix

1. Gender
   * Female
   * Male
2. Place of residence
   * Village
   * <10 thousand residents
   * 10-50 thousand residents
   * 50-100 thousand residents
   * >100 thousand residents
3. Department position
   * Student
   * Graduate
4. Course of study
   * Mining and Geology
   * Geodesy and Cartography
   * Occupational Health and Safety
   * Geoinformatics
   * Geoenergy
   * Engineering of Mineral Resources
   * Applied Geology
5. Year of study
   * 1st BSc
   * 2nd BSc
   * 3rd BSc
   * 4th BSc
   * 1st MSc
   * 2nd MSc
   * Graduate
   * PhD student
6. Have you studied at another faculty other than W6?
   * Yes
   * No
7. Where did you live during your studies?
   * Rented/own apartment in Wrocław
   * Dormitory
   * Commuted from another city
8. Did starting your studies involve separation from your family (moving to another city/changing residence for the duration of your studies)?
   * Yes
   * No
9. How often do you find yourself in a stressful situation?
   * Several times a day
   * Once a day
   * Several times a week
   * Once a week
   * Less frequently

10. What is the most frequent cause of stress for you?
    * Studies
    * Financial situation
    * Relationship
    * Family members
    * Separation from family
    * Work
    * Other
11. Are your studies a source of stress for you?
    * Yes
    * No
12. What situation at your studies is most stressful for you? (Select up to 3)
    * Exams
    * Tests
    * Credits
    * Laboratory classes
    * Project classes
    * Seminars
    * Lectures
    * Giving presentations in front of the group
    * Other students
    * Contact with professors
    * Too high level of classes
    * Too low level of classes
    * Too many requirements
    * Too few requirements
    * Too many classes
    * Poorly scheduled class timetable
    * Writing a thesis
    * Other
13. Which group of subjects causes you the most stress? (Select up to 3)
    * Mathematical (mathematical analysis, algebra, statistics, economics, etc.)
    * Mechanical (rock mechanics, technical mechanics, material strength, etc.)
    * Geological (basic geology, mineralogy, deposit geology, hydrogeology, etc.)
    * Humanities (psychology, ethics, project management, occupational health and safety, etc.)
    * Surveying (surveying, geodesy, cartography, etc.)
    * IT (informatics, information technologies, databases, GIS, etc.)
    * Drawing (engineering graphics, descriptive geometry, technical drawing, etc.)
    * Natural sciences (physics, chemistry, geophysics, mineral processing, etc.)
    * Mining (mining basics, surface mining, blasting techniques, etc.)
    * Other
14. Has stress ever caused (You can select more than one answer)
    * Absence from classes
    * Absence from exams
    * Absence from tests
    * Failure to submit a project on time
    * Withdrawal from studies
    * None of the above

15. What form of crediting is most stressful for you?
    * Oral
    * Written - multiple choice test
    * Written - open-ended questions
16. Does stress cause you to?
    * Increase motivation
    * Decrease motivation
17. How much stress do you feel during an exam you are prepared for?
    * I am not stressed at all
    * 1
    * 2
    * 3
    * 4
    * 5
    * 6
    * 7 - I am very stressed
18. How much stress do you feel during an exam you are NOT prepared for?
    * I am not stressed at all
    * 1
    * 2
    * 3
    * 4
    * 5
    * 6
    * 7 - I am very stressed
19. How much does your efficiency in completing a task change in a stressful situation?
    * Fear paralyzes me
    * 1
    * 2
    * 3
    * 4
    * 5
    * 6
    * 7 - Stress improves the quality of task performance
20. How negatively do you react to stressful situations?
    * I shout, cry, become aggressive
    * 1
    * 2
    * 3
    * 4
    * 5
    * 6
    * 7 - Stress does not affect my behavior
21. How often do you quit performing a task because of stress?
    * Never
    * 1
    * 2
    * 3
    * 4
    * 5
    * Always

22. Have you considered quitting your studies because of stress related to studying?
    * Yes
    * No
23. Has stress ever caused you to reach for (You can select more than one answer)
    * Alcohol
    * Cigarettes
    * Psychoactive substances
    * Sedatives
    * None of the above
    * Other
24. Has stress caused arguments with other students?
    * Yes
    * No
25. Has stress ever had a positive effect on your relationships with other students?
    * Yes
    * No
26. What symptoms of stress do you most often experience? (You can select more than one answer)
    * Shortness of breath
    * Excessive sweating
    * Lack of concentration
    * Increased blood pressure
    * Diarrhea
    * Vomiting
    * Headache
    * Stomach pain
    * Insomnia
    * Eating disorders
    * Decreased libido
    * Bad mood
    * No symptoms
    * Other
27. In stressful situations, can you count on support?
    * Yes
    * No
28. From whom do you receive support in stressful situations? (You can select more than one answer)
    * Family members
    * Partner
    * Friends and acquaintances
    * Psychologist
    * None of the above
    * Other
29. How do you cope with stress? (You can select more than one answer)
    * Use of substances
    * Sports
    * Gambling
    * Entertainment
    * Spending time with friends
    * Time with family
    * Talking to a psychologist

30. How often do you seek help from loved ones in stressful situations?
    * Always
    * 1
    * 2
    * 3
    * 4
    * 5
    * Never
31. Are you aware that as a student at WUST you can access free psychological help?
    * Yes
    * No
32. Do you use the free psychological help offered by WUST?
    * Yes
    * No
33. Do you think that prolonged stress can lead to depression?
    * Yes
    * No
    * Not sure
34. Do you think that prolonged stress can cause heart disease and hypertension?
    * Yes
    * No
    * Not sure
35. Do you think stress can be motivating for learning?
    * Yes
    * No
    * Not sure
36. Do you think stress is an inseparable element of studying?
    * Yes
    * No
    * Not sure
37. Do you know of any methods of dealing with stress undertaken at the Faculty of Geoengineering, Mining and Geology? (You can select more than one answer)
    * Support from mentors or psychologists
    * Proper relationships between students and professors
    * Adherence to student rights
    * Well-planned work schedule
    * Sense of security
    * None of the above
38. Do you expect other forms of support for stress from the Faculty authorities?
    * Yes
    * No