

MOTIVATION POTENTIAL IN HIGHER EDUCATION AFTER COVID-19 BASED ON PERSONALITY TRAITS

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Abstract— Covid19, which started in 2019 and continues to have an impact today, has brought many changes to the world of education, including higher education. With the return of face-to-face education, it was no longer possible to continue teaching where we left off. Students found it difficult to engage in community life and apply the necessary learning methods. With the return of face-to-face teaching, it is a common experience that students are less motivated and difficult to motivate. In our research, we looked at which methods are suitable to help students learn, arouse their interest, and motivate them. We investigated the differences between the types defined by the MBTI personality traits of the students, and which motivational methods are more successful. Our research consisted of two elements, a preliminary qualitative study, and a quantitative study. The interviews provided input from the students' side about motivation, which was processed to produce the questionnaire used in our quantitative research for the second phase of the study. From the results of the research, we found that different types of people can be motivated by different methods. In addition to teaching and learning methods, the university environment, extra-curricular activities, and the personal relationship between teacher and student play a major role in motivation.

Keywords— motivation, Covid effect, personality traits, higher education

I. CHANGES IN LEARNING AND TEACHING AFTER COVID-19

The Covid-19 pandemic, which began in 2019 and continues to affect us today, has brought many changes to the world of education, including higher education. Students have learned to study online, and educators have learned to teach online, moving to a completely different way of life, teaching, and learning environment. A good example of this is the application of gamification [1], which was tried out at the Óbuda University Alba Regia Technical Faculty.

With the return of face-to-face teaching, it was not possible to continue teaching where we left off. The students also had difficulties getting involved in community life and applying the necessary learning methods. They use a different learning method live than the one they used for two years in the online space.

A prevailing attitude in higher education is that [2] are expected to think and behave as adults, to participate in the educational process as responsible persons with the ability to self-regulate their learning. Some instructors only expect students to 'give back the learning material, perpetuating learning habits that are only in line with external motivations and assessment situations [3].

We can look at the concept of motivation from several angles. Motivation influences every single action, preceded by an action or decision, or choice [2]. As Bigg mentions it, "Motivation is a result of good learning, not a condition of it" [4]. It is important that students can be motivated by their teachers and if students learn well and achieve good results, teachers will be motivated as well [2]. Therefore, it is necessary to develop a new teaching-learning method to better trigger and maintain their interest and motivation to learn [5].

Students enrolled full-time in university undergo big changes, especially in the first year of university life. The majority of students have lived at home during their previous studies at secondary school, always having a secure background with "nothing to do but study". Their parents helped them with everything else. When they left home, they had to learn not only a new learning regime but also self-sufficiency. It was a lot of change for the young people at once, and after Covid, it was even harder for them to pick up the pace.

Several studies have been carried out on the learning characteristics of students. The result was that learning orientations about learning and knowledge are the learning characteristics that influence the methods that regulate learning [6]. Thus, in higher education, it is necessary to change teaching methods to adapt teaching to students' views. In this way, we can better motivate them and make learning more interesting.

During the COVID-19 epidemic, students spent about one and a half years of their secondary education studying at home. They were completely isolated from each other, there was less opportunity for face-to-face contact, and they kept in touch online. Students who were just starting their university studies also had to relearn the rules of social networking. Students who were starting their second year of studies also had a difficult time, because they had their first year online and did not have the opportunity to learn the rules of higher education and to develop a trusting relationship with their peers.

With the return of face-to-face teaching, the general experience is that students are less motivated and difficult to motivate. Many students struggle with a sense of everyday drabness and monotony. They feel that even when they have completed a task, they have no sense of achievement and that there is always another task to be done.

In our research, we looked at which methods are suitable to help students learn, arouse their interest, and motivate

them. We examined the differences between the types defined by the MBTI personality test [7] and the personality traits of the students and examined which motivational methods are more successful.

In our research, we were looking for answers to the question of how we could facilitate students' learning and what motivational methods we could use to appeal to them.

We divided our research into two parts.

- Qualitative research in focus groups
- Quantitative research with questionnaires

II. QUALITATIVE RESEARCH METHOD AND RESULTS

In our qualitative research, students of Óbuda University Alba Regia Technical Faculty were interviewed through focus group discussions. The first element of the research aimed to use an informal focus group discussion as an opportunity to get to know the target group of the research better and to prepare the discussion for the compilation of the quantitative questionnaire. The focus groups were attended by 5-10 participants from several years of several courses and they answered the following question:

"What would motivate you more in your learning?"

We were able to interview full-time students from the following degree courses:

- Technical Management BSc I, II, III
- Electrical Engineering BSc I, III
- IT Engineering BSc I, III
- Land Surveying Engineering BSc I, II, III

This represented a total of 9 focus groups and 104 students.

III. RESULTS OF THE QUALITATIVE RESEARCH

The importance of practice-oriented education was mentioned by all groups of students interviewed. Students find it difficult to learn theory, and they need to see how they can apply what they have learned. They could even imagine doing this with several factory visits.

In addition to practice-oriented teaching, a good theoretical curriculum with lots of explanatory texts is very important for many groups. As an idea, the students suggested that if they could receive the theoretical material before the lecture, it would help them a lot. They could bring the printed outline to the lectures and write their notes on it. In today's fast-paced world, it is difficult to keep the attention of students, and different interactive learning materials or lecture methods could be used to add color to a lesson. For each topic, they would like the lecturer to be more focused, drawing their attention to where the topic will be relevant in practice.

The strict lecturers mentioned earlier were also mentioned during the focus group discussions, that it is not enough to 'give back the material, but that they need consistent rigor. "Rigour does not equal consistency."

There was divided opinion among the groups on how to explain the theory in detail. It depends on the personality type who needs more detailed explanatory lectures and which personality type learns theory easily through

exercises. What is important, according to the students, is that the trainers are good at motivating students (and need to) with different techniques to get them to attend lectures. During the semesters, two theoretical final papers are usually written. As an option, it has been suggested to replace at least one of the final papers with some practical exercises. Students also suggested the specific idea that one of the papers could be written at home, but that this should be much more difficult than writing it at the university. Where appropriate, they should research a specific topic. During the semester, if they could get extra points for doing an extra assignment and have it count towards the result of the essay, it would also give the students an external motivation. In one group, students also mentioned the grade offered as a motivating goal for them.

In group discussions, students mentioned project tasks as something they liked and could do more of, getting to know each other better and learning to work together or alongside each other in teams, in addition to learning. It also develops their personality; they learn empathy and tolerance. The possibility of team building was raised with one group.

During Covid, online test-taking, practice and debriefing were also used. This was very much appreciated and several groups specifically mentioned that they had learned a lot from the practice tests. One group also mentioned independent work in this area. This is very useful and they can learn a lot from it. The reward for completing the tasks was highlighted by the students.

The next big topic was scholarships. Here, opinions were very divided in the groups, as some were very concerned about this issue and others were completely unmotivated. What came up in several discussions was the calculation of the scholarship. In its current form, this was not considered appropriate by several groups, and ideas were put forward on how it could be well adapted so that the scholarship could also be a good external motivator. Besides the amount, another problem for students is that the money does not arrive in their accounts on time. As prices change over the years, it would be good if the amount of the scholarship could also increase.

For three groups, the development and extension of infrastructure have been raised. Respondents think that more and more modern practical equipment is needed for the training.

The third major theme is the relationship between teachers and students, both in and out of the classroom. Most of the groups mentioned the importance of good relations between trainers and students. Personal contact outside the classroom is very important so that the student can ask for help with the current course material and assignments. The interviews also revealed that students are more courageous to ask for help when they are on a first-name basis with the instructor than when they are in a private relationship.

A predictable rhythm was also highlighted by many. They like to see what will happen when because then they can plan.

IV. QUANTITATIVE RESEARCH METHOD AND RESULTS

Our quantitative research was carried out using Google Forms, an online interface that was easily accessible to the target group via the link provided. The questionnaire was filled in by 104 full-time students of the Óbuda University Alba Regia Technical Faculty (20 students in technical management BSc, 50 students in land surveying BSc, 18 students in electrical engineering BSc, 46 students in IT engineering BSc).

A personality test preceded the answers to our questions on student motivation. Nowadays, there are several excellent internationally accepted personality tests, also in Hungarian, to choose from. After much deliberation, we chose the validated Myers-Briggs Type Indicator (MBTI) personality test in online format [8], [9]. It was considered a good choice because it examines many aspects of an individual's personality, and the official Hungarian version is freely available (<https://www.16personalities.com/hu>). The theory underlying the test is that the seemingly random variation in behavior is quite orderly and consistent. People differ systematically in what they perceive and how they reach conclusions, and they differ in their interests, reactions, values, motivations, and abilities.

The test consists of 60 statements, the answers are given on a scale of 1 to 7, with which answers the respondent agrees. Circles indicate the values, and their size varies. In the end, the program shows you which personality type you belong to, based on your answers.

The personality test distinguishes between four categories:

- The first pair of psychological preferences, shows where the respondent focuses his or her attention and where he or she draws his or her energy from. Does the respondent prefer to spend time in the external world of people and things (Extraversion / Extraversion / E) or the world of inner thoughts and images (Introversion / Introversion / I)?
- The second pair of psychological preferences is the realistic perception of the environment and intuition. Which information does the individual pay more attention to, that which is received through the five senses (Realistic / Sensing / S) or does he pay more attention to that which is intuitively perceived based on the information received (Intuitive / Intuition / N)?
- The third preference pair shows how the respondent makes his/her decisions. Do you place more weight on objective principles and impersonal facts (Logical / Thinking / T) or do you prefer to pay more attention to personal concerns and the people involved (Intuitive / Feeling / F)?
- The fourth pair of preferences describe how the individual prefers to present him/herself to the outside world. Does he or she prefer a more structured and decisive behavior (Planning / Judging / J) or a more flexible and adaptable behavior (Researching / Perceiving / P)?

In the above categories, the test gives the individual measurement results as a percentage at the end of the test followed by a detailed description of the personality type identified by the test.

The MBTI distinguishes 4 types per category in 4 broad categories (16 personality types in total). These are discussed below in the focus of our topic, according to the motivation that characterizes each type [9]:

1. Analysts:

- Architect (INTJ) - They seek the cause of events, and they brainstorm. They are visual types. They look for connections.
- Scientist (INTP) - More ideas are important to them. They can be motivated by specific readings and tasks.
- Commander (ENTJ) - They filter the material and learn quickly. They like to work in teams, brainstorm, and initiate discussions.
- Debater (ENTP) - They are motivated by complex tasks, they use a logical approach to solve the problem. Tasks should be conceptually based, pay attention to multiple solutions, and link the material to the application.

2. Diplomats:

- Advocate (INFJ) - Motivated by the prospect of solving humanity's problems. They like to push boundaries, listening to their intuition. They tend to work independently and prefer theoretical tasks. They like to work in teams and are visual types.
- Mediator (INFP) - They are concerned about human problems; they value information about human behavior. They have an eye for understanding the goal. They need to use visual materials in lessons and see multiple perspectives on a task.
- Protagonist (ENFJ) - The context is important for them and to help human development, the curriculum should be taught. Active learning is useful for them.
- Campaigner (ENFP) - Issues related to people are important to them. They are motivated by caring about people. Logical connections are not important in learning, they can learn large amounts of material. They like tasks that require creativity.

3. Guards:

- Logistician (ISTJ) - Goal setting, practical training, and teamwork are important to them.
- Defender (ISFJ) - They put a lot of emphasis on theoretical knowledge to understand how they can use it in practice. Examples are important to them; the curriculum should include details and facts for them.
- Executive (ESTJ) - Arousing interest, good theoretical material, video, active involvement in the lesson is motivating for them.
- Consul (ESFJ) - These types of people are people-oriented, and theoretical knowledge is important to them. They do not need logical information; they can easily memorize details. They learn better when they are emotionally involved.

4. Explorers:

- Virtuoso (ISTP) - They have a technical mind, they are constantly looking for tools to improve.

- Adventurer (ISFP) - If they are aesthetically pleasing to the subject, they are enthusiastic learners. They do not need logical thinking; they can do mechanical memorization. A lot of lecture material, and emotion is important for them.
- Entrepreneur (ESTP) - Practical solution seekers. They can memorize small details. They learn from examples and participation in discussions. They like group work.
- Entertainer (ESFP) - They grasp new material quickly when they see it applied, especially if it entertains them. They like to communicate actively in the process and can remember a lot of information without logical thinking. They are visual types, and examples are important.

Table 1 shows the distribution of the 104 participants in the survey by MBTI type. The largest proportion of the sample was 'Diplomats', N=43 (41%). Within the main category, the most typical personality types were 'Protagonists' (N=16) and 'Advocates' (N=15). 'Analysts' N=24 (23%), 'Guardians' N=20 (19%) and 'Explorers' N=17 (16%).

TABLE 1 DISTRIBUTION OF THE SAMPLE BY MBTI TYPE (PERSONS)

Analysts	24	Diplomats	43	Guardians	20	Explorers	17
Architect INTJ	8	Defense lawyer INFJ	15	Logistic ISTJ	3	Virtuoso ISTP	3
Scientist INTP	8	Mediator INFP	9	Defender ISFJ	7	Adventurous ISFP	4
Commander ENTJ	4	Protagonist ENFJ	16	Leader ESTJ	4	Entrepreneurial ESTP	2
Debater ENTP	4	Campaigner ENFP	3	Consultant ESFJ	6	Entertaining ESFP	8

The second element of the quantitative research was a questionnaire, in which the first item was the personality type code obtained because of the MBTI test. Six questions were formulated in the questionnaire using the results of the qualitative research. On a Likert scale of 1-7, respondents were asked to rate the extent to which each question influenced their motivation to learn. 1 being the least and 7 being the most important, most influential on their learning. We chose the 1-7 scale because we felt that they could not necessarily express their feelings accurately on the 1-5 scale, and the 1-10 scale was very broad.

We asked the students the following questions:

"How much does it affect your learning:

1. your relationship with your tutors
2. the extra-curricular activities you do together
3. the scholarship
4. the practical orientation of the teaching
5. attending a good theoretical lecture
6. your relationship with your peers"

V. RESULTS OF THE QUANTITATIVE RESEARCH

The results of our quantitative research were analyzed in Excel. Six charts were created for the six questions, shown in Figures 1-6, where the horizontal axis shows the personality types, and the vertical column shows the average scores from 1-7.

The first question examined the importance of good rapport with instructors, with an average score of 4.95 on a

scale of 1-7. The first chart (Figure 1) clearly shows that for the personality types Adventurous, Scholar and Leader, it is most important to have a good relationship with the instructor (mean 5.75). It is also important to be available to them outside of class if they have questions about the assignment.

The least important for the Commanding and Virtuoso personality types is the need to maintain regular, direct contact with their respective instructors (mean: 3.50).

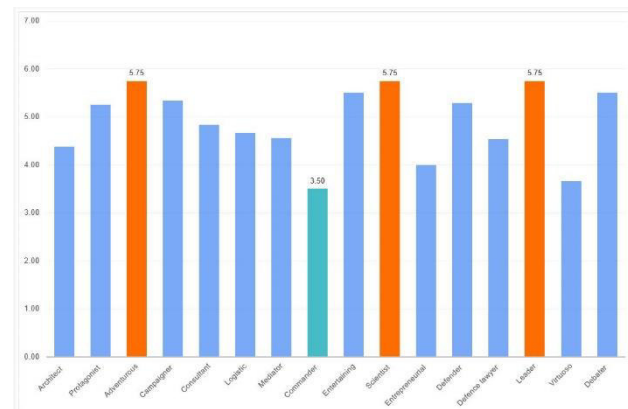


Figure 1: How much does your relationship with your teachers influence your learning

Figure 2 illustrates personality types, for whom the extra-curricular activities are important. The average value for the whole sample was 4.13. Here, the value for the Leader personality type is the highest (mean: 6.00). This shows that it is important for him to have contact with everyone. The Campaign Leader and Fun personalities also have high scores, and they may be influenced in their learning by the company they can fit in with, and the extent to which they can have a student life outside of the compulsory study programs at university. Those with the lowest mean score here are the Virtuoso personality (mean: 1.67) and are less likely to be motivated by this.

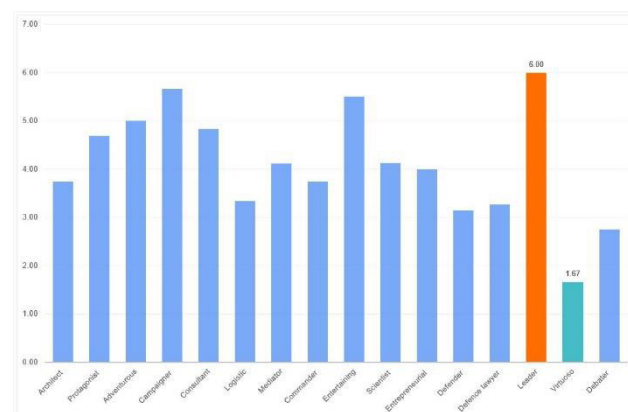


Figure 2: How much does the extra-curricular program influence your learning?

The question of the importance of scholarships was also shared across the qualitative focus group discussions (Figure 3). The average score across the whole sample was 4.60. Scholarships had the least impact on learning for the Virtuoso-type students (mean: 2.67). They were not motivated by any of the questions asked. Here, the highest score was for the Commander's type (7.00).

During the focus group discussions, the students told us that their parents' main motivation was money, they worked a lot when they were children, and they did not see a positive outcome. They had a variety of mental and physical problems and illnesses. They could not enjoy the use of money to the extent that they worked for it. During the interviews, students said that other types of recognition were important in addition to financial recognition. For example, feedback from managers, and flexible working hours [10].

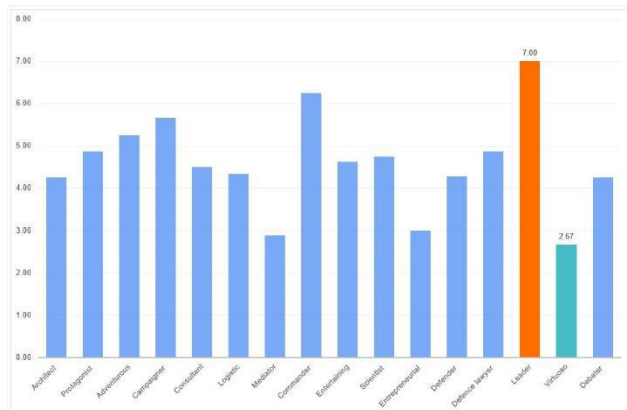


Figure 3: How much does the scholarship affect your learning?

The highest scores, and hence the most important motivational element for this generation, is practice-oriented training. They memorize, learn and comprehend better when they can see the connections and the meaning of what they have learned in practice. The average score for the whole sample was 5.81. The lowest value here was also 4.50, which is the highest minimum value when considering the other factors examined (Figure 4). The importance of this was also mentioned by all teams during the focus group discussions.

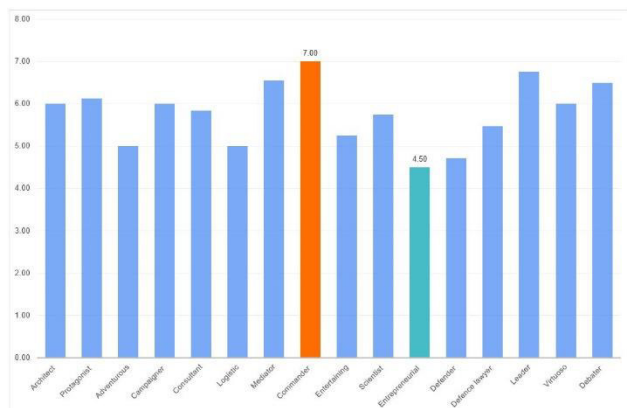


Figure 4: How much does the practical orientation of education influence your learning?

When asked how much a good theoretical curriculum influences learning, there is no extreme difference. The average score across the whole sample was 4.79. Those who are highly motivated by this are Logistic personalities (mean: 6.67). This is shown in Figure 5. The other personality types do not show a large variance.

The importance of good relationships with peers in learning was assessed in the next question (Figure 6). The average score across the whole sample was 5.21.

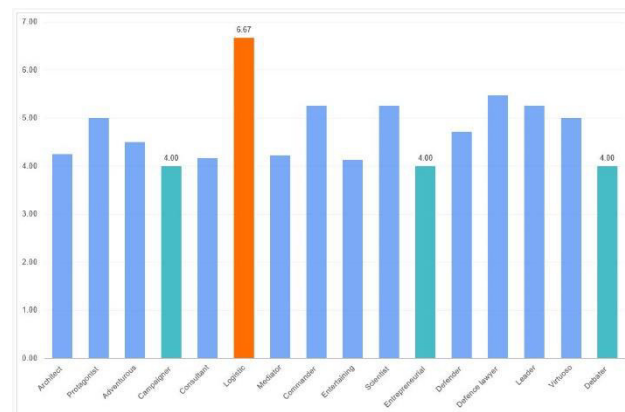


Figure 5: How much does attending a good theory lecture influence your learning?

Relationships with peers were the most important for the Campaign Leader (mean: 6.67) and the least important for the Virtuoso personality (mean: 2.00). The results of our study suggest that this personality type is best motivated by practice-oriented training.

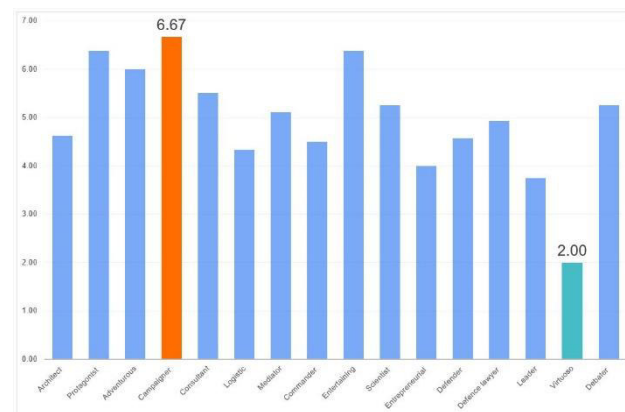


Figure 6: How much does your relationship with your peers influence your learning?

The last question was open-ended "What other motivational opportunities help you to learn?" This question was optional. Compared to our previous experience, when we asked an optional open question in the questionnaires, not many people answered, but this time almost everyone did.

The students consider it important to have a good timetable so that they can fit in their leisure activities with their studies. The sport was highlighted in particular.

Intrinsic motivations included having a vision of what they want to achieve in life and what drives them to move forward. Positive feedback after a paper or report makes them feel good that it was worth learning. What several students highlighted was literacy. If they study a lot, they become more literate in each subject. Goal setting and the desire to improve are important. External motivations included the importance of theoretical and practical education.

The following were highlighted by several students: the instructor's preparation for the lessons, competition in the subject matter, and completion of tests. Offering a grade at the end of the semester. Mutual respect between instructors and students. Showing in practical classes what and where you can use what you have learned, gaining extra points for

the exam. Providing accurate information on what the student can find where. Transparency and comprehensibility of the course material.

In our fast world, technology is also rapidly evolving, it is important that when students graduate from university, they can work immediately in the workforce with the tools they use in the workplace, not learning outdated methods. Several students wrote this.

Students also set goals for themselves, for example, one student wrote that he was motivated by the fact that if he studied for half an hour, he would allow himself to play a video game for half an hour. This is how he rewards himself.

Another important motivating factor is human relations. Here several people wrote about the parent-child relationship. Even at this age, it can be observed that the pupil is not only learning for himself but also wants to please his mother and father. The family background is very important for them.

The relationship with their classmates and classmates, both in learning and in leisure activities. Students prefer to study in small groups and work together to solve problems. In general, group members who study together also do leisure activities together. Conversations were also highlighted, informal casual discussions with each other on specific topics. The third human relationship highlighted was the relationship with the teachers. It is important to dare to ask for help if they get stuck.

The last motivational incentive highlighted was money. In the academic world, it is the scholarship, in the working world, it is the salary. Today's students are much more likely than in previous years to take jobs alongside their studies to finance their studies and support their livelihoods, and possibly their families. There are also frequent examples of students moving from full-time to part-time study to find a full-time job. In the world of work, a secure financial future and advancement are important goals and motivations for them in their studies. A clear tangible vision.

Two students wrote the following in response to the open question:

"Ancient and medieval Chinese culture and mythology have been an integral part of my life for nearly a decade and a half. From their stories, I have come to understand that knowledge is one of the most important things in a person's life and that knowledge is a respectable, authoritative quality. Besides, I have often been assigned to work as a teacher, mainly tutoring primary and secondary school students in all kinds of subjects, by organizing my school. It makes me feel good to have knowledge that I can use to help others in their studies. Also, my language skills have given me quite good job opportunities (3 foreign languages)."

"I set myself goals that are within reach. I try to do my best, but I often run into difficulties. For example, I had an exam here at my university that I studied a lot for, and I was one of the best in that subject, I helped a lot my peers' week after week with the papers and I almost failed the exam. If something unfair happens to me, it affects my motivation. I'm motivated by being a role model for other people, making my mum and dad proud of me, and much more. I have ambitious plans to make an impact in my local community."

VI. SUMMARY

In our research, we were looking for answers to the question of how we can motivate students studying at university and make learning interesting for them. We used the MBTI personality test to find the most effective motivational tools for each personality type. The sample of our study is a small segment of university students, general conclusions can only be drawn based on larger, multi-institutional further research.

However, it is already clear from this small study sample of 105 students that we can no longer simply apply the previous, mainly frontal learning methodologies to Generation Z students and their successors. University education also needs to be radically renewed, and alternative methodological techniques need to be used to arouse and maintain young people's interest and to ensure that they leave their chosen university with a positive feeling and knowledge that is useful for the labor market.

There is also a common perception in the world of education that young people are not hard-working and persistent enough, that they are incapable of hard work, and are generally characterized as less capable than the older generation. This may be because the standards set by the older generation of teachers are no longer valid. The young generation of the 21st century is no less interested than their predecessors, but their attitudes to learning need to be recognized, and teaching thinking and methods need to be transformed so that higher education can continue to innovate in the fast-changing world of the 21st century.

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