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Student Personality Database of the Hanoi University of Civil Engineering: Some Initial Results and Suggestions on the Direction of Exploitation to Form and Develop a More Comprehensive Training Environment

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Abstract. Understanding of personality is the premise to conquer and control their activities effectively. In the 21st century, understanding personality will help people understand themselves and those around them better, become free, different, promote innovation and creativity, cooperate and connect. Database is an organized collection of data, usually stored and accessed electronically from a computer system to meet the needs of exploitation and use by many people at the same time. Student personality database is a collection of data on students' personality changes over each academic year. It is a necessary and important data for the students themselves and the school. Through this virtual environment, schools and teachers organize and facilitate learning in different directions, in accordance with the personality characteristics of each target group, helping to improve the quality of training. For individual students, self-recognition of their own strengths and weaknesses will help them unleash their potential, promote positivity, be proactive in creativity, improve themselves in a better direction, be more confident and ready to integrate.

Keywords: Big Five, Personality, Mindset, Student, Database, Training, Education, Civil Engineering.

INTRODUCTION

The word "personality" is derived from the Latin terms for mask, emphasizes the importance of external influences. There are many definitions of personality. As early as 1927, G.W. Allport cited nearly 50 different definitions of personality by psychologists. Although the approaches are different, even though they come from very different basic points about human psychology, they all arrive at an understanding of personality as human attitudes towards the surrounding world, towards others and with oneself. At birth the individual is not yet a personality. Personality is formed during the process of living and growing up in society. Depending on the living conditions, the personality will develop in which direction. Usually, when consciousness develops to a certain level, personality begins to form and develops according to the process of human maturity.

According to the General Statistics Office of Vietnam, as of the 2019–2020 school year, Vietnam has 237 universities and academies (172 public and 65 private ones), excluding universities in the security and military sector [1]. Among them, engineering schools account for about 30%. Currently, in technical schools in general and the Hanoi National University of Civil Engineering in particular, the criteria for assessing students' learning and training results are mostly based on a score system. Scores are mainly assessed based on performing hard skills but have not fully and comprehensively assessed the student's personality.

Developing and perfecting the personality of the young generation is always the focus of education and training. In the current period, the Fourth Industrial Revolution is having a strong impact on the future of careers, and the human resource market is facing unpredictable changes. In addition to specialized knowledge, students need to actively equip themselves with multi-disciplinary, cross-field knowledge, positive thinking, other social skills to adapt to the change of career in the future. In particular, understanding personality will help students improve themselves, hone skills that are lacking, as well as enhance the ability to connect and cooperate with others.

There are many models and tests that assess personality such as projective and objective tests used Eysenck personality questionnaire (EPQ – Eysenck Personality Questionnaire), three-dimensional personality questionnaire (TPQ – Tridimetional Personality Questionnaire), MMPI (Minnesota Multiphasic Personality Inventory), STAI (State) – Trait Anxiety Inventory), NEO-PI-R (Revised NEO Personality Inventory). In this direction, the works were "Vietnamized" or initially adapted some standardization methods to measure and assess personality like adapting creative test; social skills test; personality value orientation test; Cattell 16 PF personality test; TAT projection test; NEO PI-R. Research directions for student personality characteristics are quite diverse. Each study comes from a concept of personality, about the structure and tools used to measure personality. But most of the studies are quantitative studies, quantifying personality factors, based on standardized methods, personality assessment such as EPQ test, MMPI, 16PF, NEO-PI-R, etc. In which, in Vietnam, a new theory of personality – "The Big Five of Personality Traits" (Big Five) is widely applied and supported by personality researchers.

When typing the word "Big Five" on a computer, within 0.64 seconds, there are 2,620,000,000 results; A huge number of words are searched on the Internet showing the depth of human interest in an issue. Big Five is a model that evaluates people according to 5 personalities (ability/problems): 1) Emotional Stability, also known as Neuroticism; 2) Agreeableness; 3) Extraversion; 4) Conscientiousness; 5) Ready to experience (Openness). The first two factors (1) and (2) are endogenous, from the inside we look out; the following two factors (4) and (5) are external, from the outside towards us. Factor (3) is an intermediary between endogenous and imported factors.

The Hanoi University of Civil Engineering, was funded through a scientific research of the Ministry of Education and Training (research code B2020-XDA-01) "Developing entrepreneurship capacity for students in the civil engineering in Vietnam", has built a database of student personality of the university according to the model of "Big Five", firstly at the Faculty of Architecture and Planning. The personality database is an important resource for the school and teachers to design appropriate curricula; students evaluate and perfect themselves over time.

LITERATURE REVIEW

There are many scientific projects on personality, personality of students at universities around the world and in Vietnam. Specifically.

In the world, in the research project "Breakout level and personality traits – Case study of architecture students – University of Cukurova – Turkey" (2012) [2], the authors Gözde Tantekin Celik and Emel Laptali Oral investigated the relationship between personality traits and burnout levels of Architecture students from year 1 to year 4 at the University of Cukurova. Two tools used by the authors to measure and collect data are the Burnout Inventory-Student Survey (MBI), which measures levels of emotional burnout, and the Five Factor Model (FFM), which measures personality traits. Subjects participating in the study were 208 architectural students. Research has shown that the educational process is an extremely important factor in personality development, as well as affecting the level of student burnout.

In the research "Study strategies, personality characteristics, and academic achievement of university students" (2015), author Verešová Marcela of the Faculty of Education, Philosopher University, Slovakia [3] has noted the significant correlation between learning styles, personality traits, and student achievement. 254 graduated students of the first phase of a new degree program took the test. In this study, the factors proposed for analysis are learning strategies (self-relationship, deep learning, question and answer, event memorization), Big Five personality traits (Emotional Stability; Agreeableness; Extraversion; Conscientiousness; Openness) and academic achievement (measured by GPA and final exam performance). Specifically, all four learning strategies are strongly correlated with student achievement. The study also showed a positive impact between these four learning strategies and the two personality traits "Ready to experience" and "Conscientiousness". Strengthening these two personality traits will also increase students' academic achievements.

In a similar research, "The role of personality traits – Big Five and predicting success of interior students" 2010 by Lori A. Brunner, 100 students of interior majors in different school years at Midwestern University, USA took the Big Five Inventory test (BFI) consisted of 44 questions, to measure 5 aspects of students' personality. The study also

took the GPA of those students and found the correlation between the average score and the above personality traits. The results show that the aspect of "Conscientiousness" has a strong impact on GPA scores as well as predicting student success in the post-graduation work environment. This result is similar to many other studies on the same topic.

In Vietnam, research on "Some personality characteristics of students studying in different disciplines (research by multiple choice NEO PI-R)" by Dinh Thi Kim Thoa and Tran Van Cong was carried out in 2010 [5] pointed out personality differences within a social group where different performance characteristics determine that difference. The study delves into the comparison of personality characteristics of different disciplines using modern statistical probability algorithms through a shortened version of the Five Factor Model (FFM). The research object of the topic is 1182 students from 8 colleges and universities in 2 cities of Hanoi and Da Nang with about 20 different majors. They have shown 22 differences in some personality characteristics among the different disciplines and between male and female students.

In another study at Hanoi University of Science and Technology, "Personal characteristics of students at Polytechnic University" conducted by author Bui Thi Thuy Hang in 2016 [6] showed a picture of general personality traits of students at Hanoi University of Science and Technology. Subjects of the study are 228 students from many different disciplines (Physical engineering, chemistry, biology, mechanics, metallurgy, dynamic mechanics, electricity, telecommunications, information technology, refrigeration, economics management). Students surveyed had an average age of 21.67 years. The study uses NEO60VN as a measuring tool, adapted from the NEO-PI-R test, to assess five aspects of human personality.

Another research was also conducted to understand the personality of students, "Building student personality at universities in Binh Dinh province" by author Tang Van Thanh [7]. The thesis uses the methodology of dialectical materialism and historical materialism, historical – logical method, synthesis, analysis, statistics, comparison, different specialized and interdisciplinary methods. The study also uses sociological investigation method to conduct a survey of the current status of student personality at universities in Binh Dinh province with a sample of 500 students, thereby proposing directions and some basic solutions to build student personality in universities in Binh Dinh province today.

In the study "Outstanding creative personality traits of students of Hanoi University of Agriculture" in 2010, author Dang Thi Van [8] used the method of socialization investigation combined with in-depth interviews to learn about the creative personality traits of students at the University of Agriculture, including 6 basic qualities of creative personality: job interest, risk-taking, motivation for success, need for achievement, self-affirmation, and imaginative. Subjects participating in the study are 460 students from the Biotechnology, Crop, Veterinary and Environment majors of the University of Agriculture. The analysis results showed that the students of the University of Agriculture have creative personality qualities but have not been clearly and uniformly expressed. Two of the qualities that are clearly demonstrated in students are the need to achieve and the interest in the profession. On the contrary, their adventurousness and imagination have not been clearly revealed. This result helps students identify their personality traits to strive for, as well as for teachers to find effective methods to help students perform tasks well.

The 2019 school-level scientific research project of the Department of Architecture and Technology, Faculty of Architecture and Planning, Hanoi University of Civil Engineering, "Research on first-year student personality characteristics in order to enhance the effectiveness of training in Architecture and Planning field" [9]. The study presented a picture of the first-year student's personality, from which it proposes to organize group study activities and scientific research to improve group work performance, and recommendations related to the selection of extracurricular activities to develop necessary soft skills.

There are many different works on student personality. However, the results of the student personality surveys of the above studies were not aggregated into a database so that the test-takers themselves can redo, compare, and compare to see the changes; to compare with others at the same level as test-takers to recognize their strengths and weaknesses, thereby cultivating, training, and striving to become a better person.

Student personality database, through pilot study at the Faculty of Architecture and Planning, Hanoi University of Civil Engineering is Vietnam's first database on this issue.

MATERIALS AND METHODS

The research group has consulted the personality assessment websites according to the Big Five model in the world [10–13] in Vietnam and created the evaluation software "Big Five" for students in particular and for everyone in general "talaai.com.vn" (Ta Là Ai?/Who Am I?).

FIGURE 1. (a) The home page interface of talaai.com.vn

FIGURE 1. (b) The question set.

All figures of this paper are taken directly (print screen) from the website talaai.com.vn created and owned by the research team.

This is web-based software consisting of the 90-question set. The self-assessment test-taker answers each question honestly on a five-point scale on a question: i) Strongly disagree; ii) Disagree; iii) Neutral: iv) Agree; v) Strongly agree for five factors 1) Emotional Stability (ES), also known as Neuroticism; 2) Agreeableness (A); 3) Extraversion €; 4) Conscientiousness (C); 5) Ready to experience (Openness) (O). Then, each person receives the testing result via the symbol likes a pentagon formed by the response score levels (the highest score for each wing is 60 points).

Each person's pentagon can change over time in connection with changes in their education, occupation, and level of responsibility.

When compared with the pentagon of others, he/she can evoke an awakening for self-study, study and learning. There is no good or bad pentagon. This is just a suggestion for students in the process of self-discovery.

Anyone can take the survey, thereby, understanding their own strengths and weaknesses. At the same time, compare his/her results with the average results of people at the same academic year, the same level of responsibility, the same school, the same major to change themselves in a positive direction. Instead of just relying on score evaluation, teachers can analyze and synthesize students' abilities in class based on these results and suggest activities to enhance soft skills training for students that were previously unavailable and unsuitable.
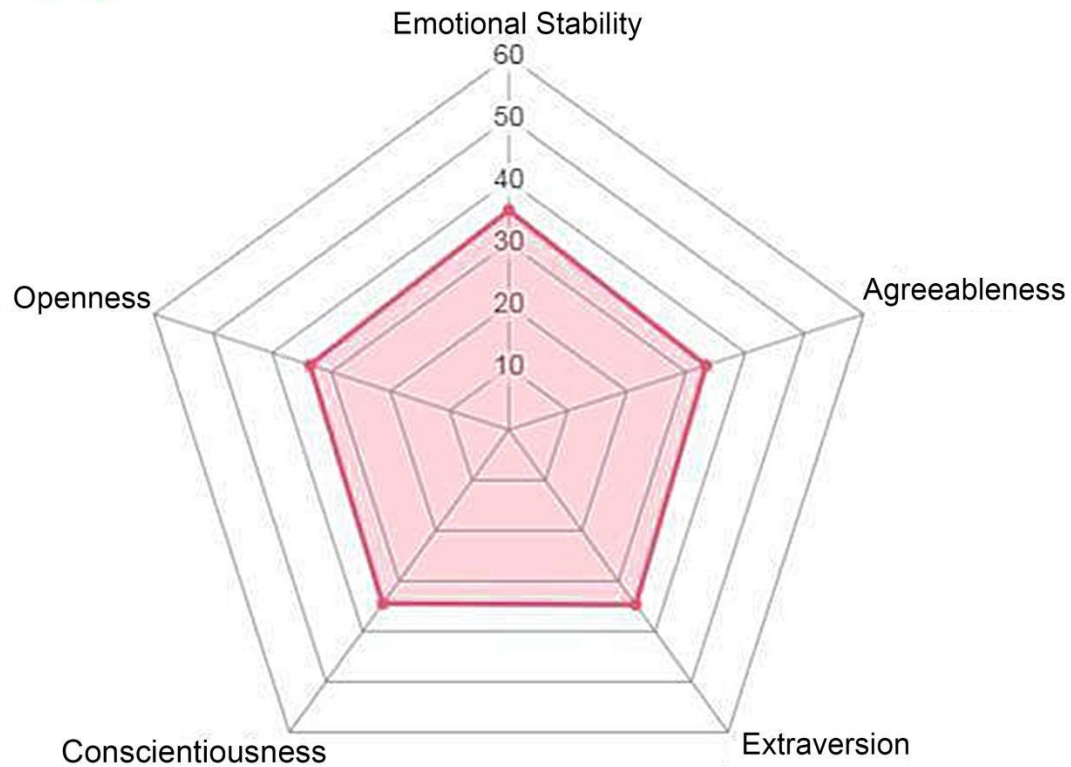
RESULTS

After completing and publishing the web-based software (talaai.com.vn), around 13,000 people took the test, in which, the research team filtered the results of 295 students: 119 first-year, 96 third-year and 80 fifth-year students of the Faculty of Architecture and Planning, Hanoi University of Civil Engineering.

Test results of students of the Faculty of Architecture and Planning, the Hanoi University of Civil Engineering.

The number of survey participants: 144   Student year | Năm 1 ⌄ |

Result
Emotional Stability (ES): **35.25 points**
Agreeableness (A): **33.36 points**
Extraversion (E) : **34.72 points**
Conscientiousness (C): **34.5 points**
Openness (O): **33.64 points**

FIGURE 2. The average result of the 1st year students.

The number of survey participants: 92   Student year [Năm 3 ˅]

Level: University; Hanoi University of civil Engineering; Architecture - Planning

Result
Emotional Stability (ES): **37.65 points**
Agreeableness (A): **36.63 points**
Extraversion (E) : **32.25 points**
Conscientiousness (C): **36.68 points**
Openness (O): **39.88 points**

FIGURE 3. The average result of the 3rd year students.

The number of survey participants: 134   Student year [Năm 5 ˅]

Level: University; Hanoi University of civil Engineering; Architecture - Planning

Result
- Emotional Stability (ES): **38.25 points**
- Agreeableness (A): **36.34 points**
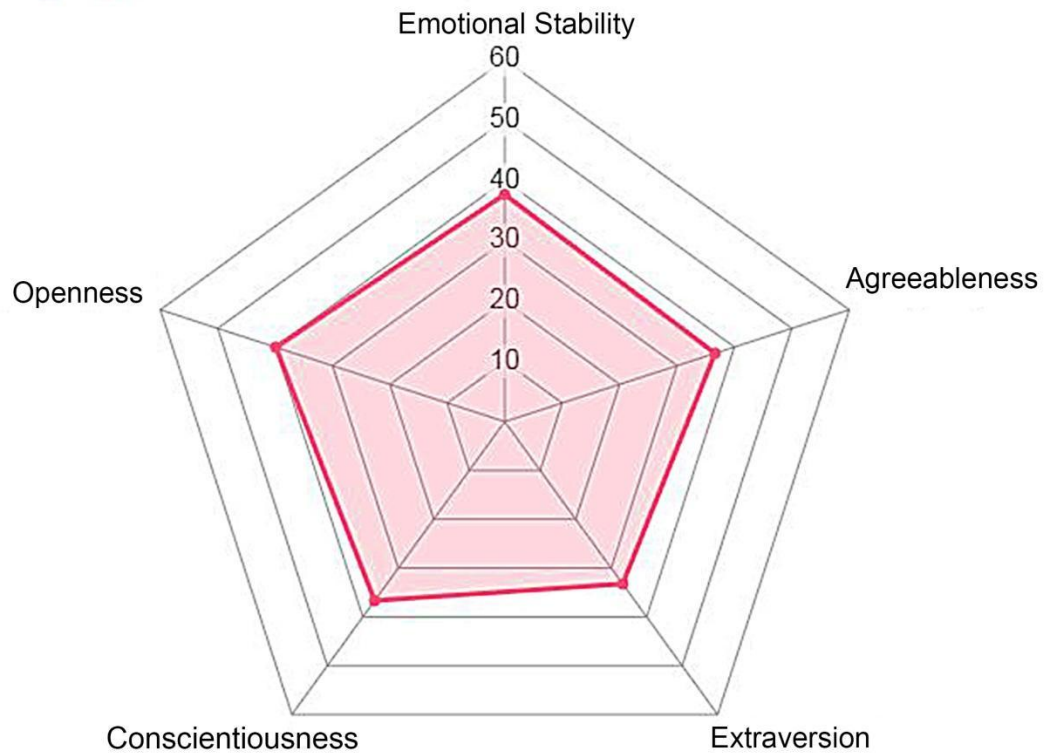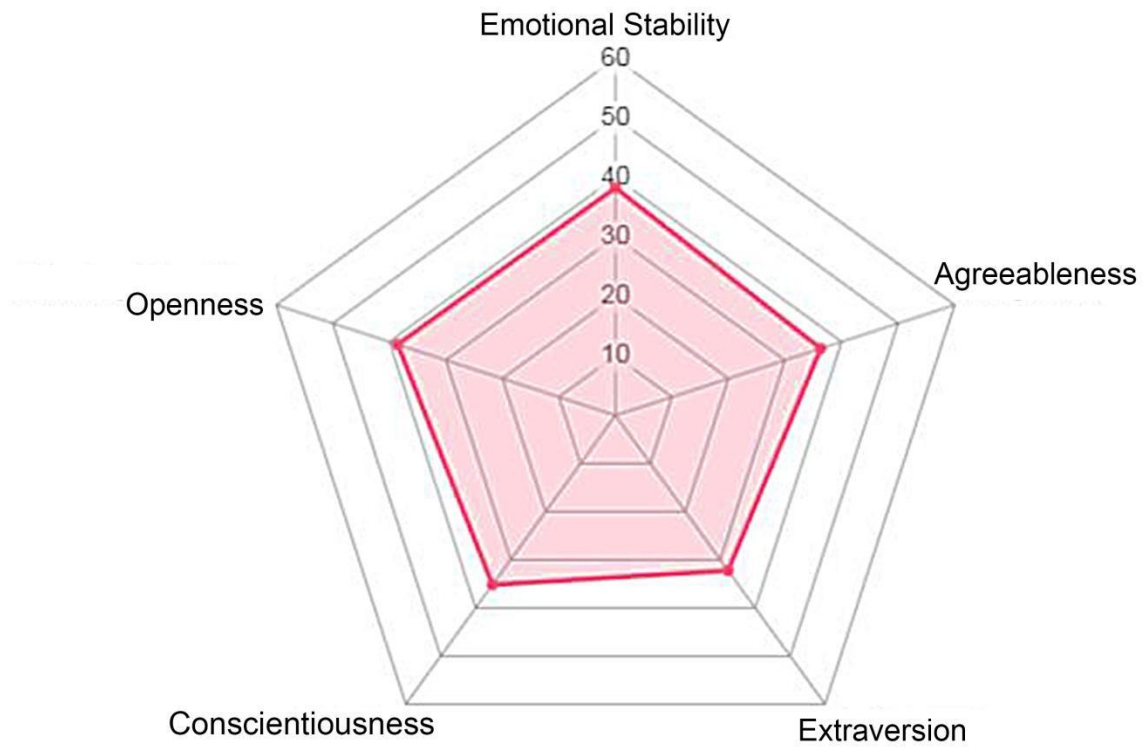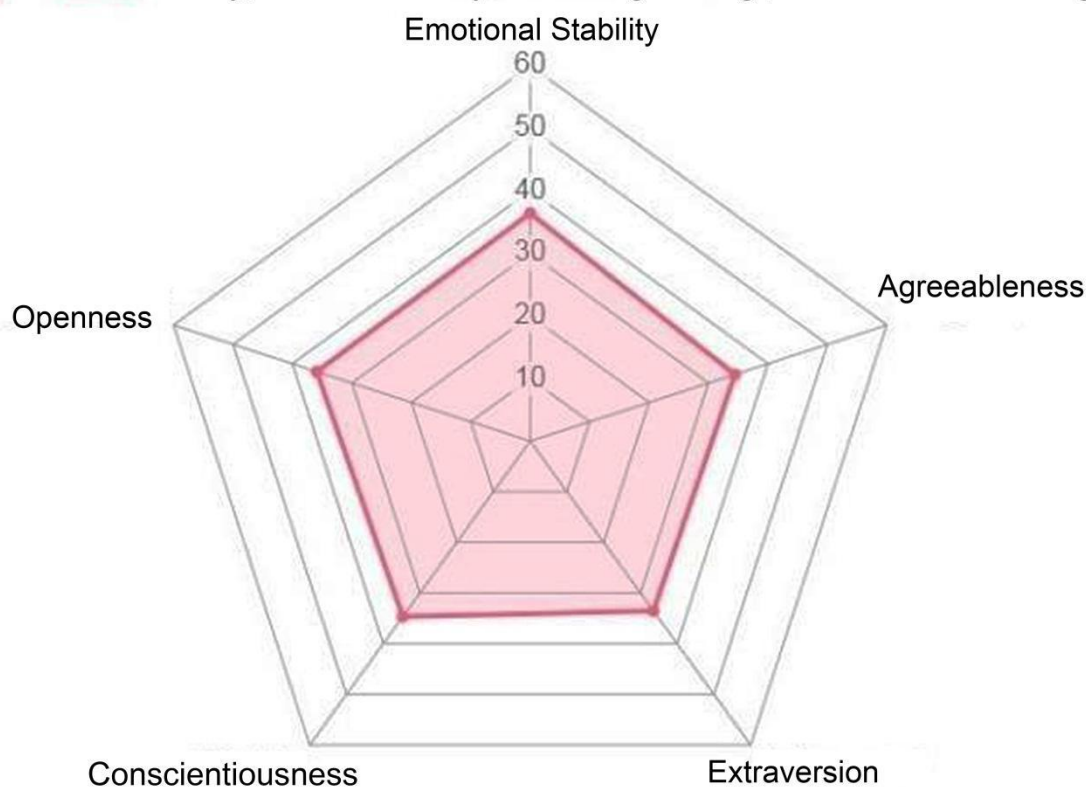- Extraversion (E) : **32.25 points**
- Conscientiousness (C): **35.21 points**
- Openness (O): **38.53 points**

FIGURE 4. The average result of the 5th year students.

Result
- Emotional Stability (ES): **36.41 points**
- Agreeableness (A): **34.45 points**
- Extraversion (E) : **33.55 points**
- Conscientiousness (C): **34.67 points**
- Openness (O): **35.91 points**

FIGURE 5. The average result of the whole faculty.

Specific results. The ratio of good and rather pentagon in the 1st year accounts for a large proportion, about 65%; The percentage of good and rather decreases when entering years 3 and 5 but the change between years 3 and 5 is not much; The above average and average percentage increases in 3rd year students and tends to decrease in 5th year students; The percentage of weak pentagon increased from 10% in year 1 to 19.78% in year 3 and to 26.25% (about a quarter of the students). The percentage of weak pentagon increases steadily from year 1 to year 5.

TABLE 1. The specific test results

№	Items	Number of students	Percentage (%)	Remarks
A	*Year 1 students*			
1	Good	22	20,00	65,45
2	Rather	50	45,45	
3	Above average	14	12,73	24,55
4	Average	13	11,82	
5	Weak	11	10,00	
	Total	**119**	**100,0**	**100,0**
B	*Year 3 students*			
1	Good	4	4,17	34,38
2	Rather	29	30,21	
3	Above average	13	13,54	45,83
4	Average	31	32,29	
5	Weak	19	19,79	19,79
	Total	**96**	**100,0**	**100,0**
C	*Year 5 students*			
1	Good	3	3,75	38,75
2	Rather	28	35,00	
3	Above average	11	13,75	35,00
4	Average	17	21,25	
5	Weak	21	26,25	26,25
	Total	**80**	**100,0**	**100,00**

Examples of weak personality trait results:
+ Weak in terms of Emotional Stability (Fig. 6).
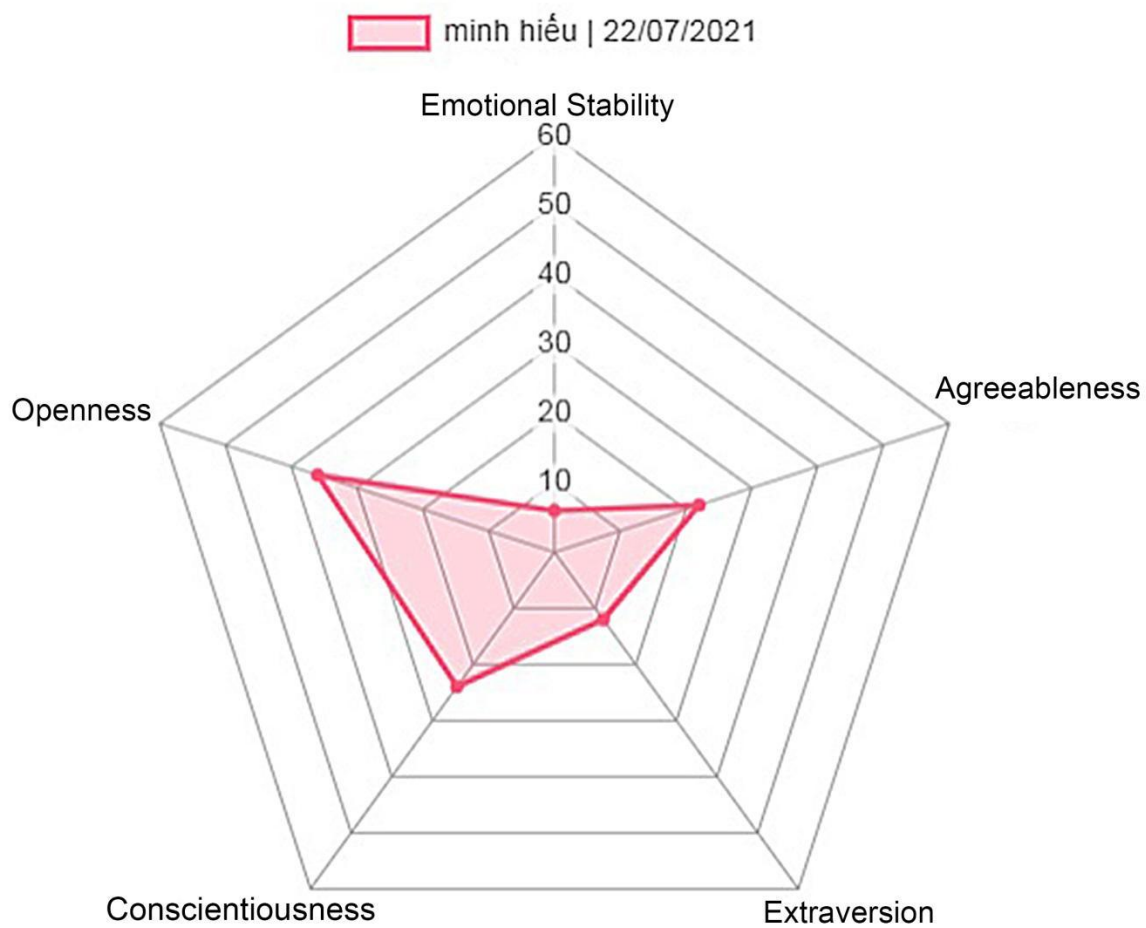
FIGURE 6. (a) Minh Hieu, a 3rd year student whose result showed weakness in all aspects, especially in terms of Emotional Stability;

FIGURE 6. (b) Compare Minh Hieu's result with the average result of the 3rd year students. Pink zone: Minh Hieu's result. Orange zone: Average result of the 3rd year students

+ Weak in terms of Agreeableness (Fig. 7).

FIGURE 7. (a) Hoa, a 1st year student whose test result showed weakness in terms of Agreeableness;

FIGURE 7. (b) Compare Hoa's result with the average result of the 1st year students. Pink zone: Hoa's result. Orange zone: Average result of the 1st year students.

+ Weak in terms of Conscientiousness (Fig. 8).

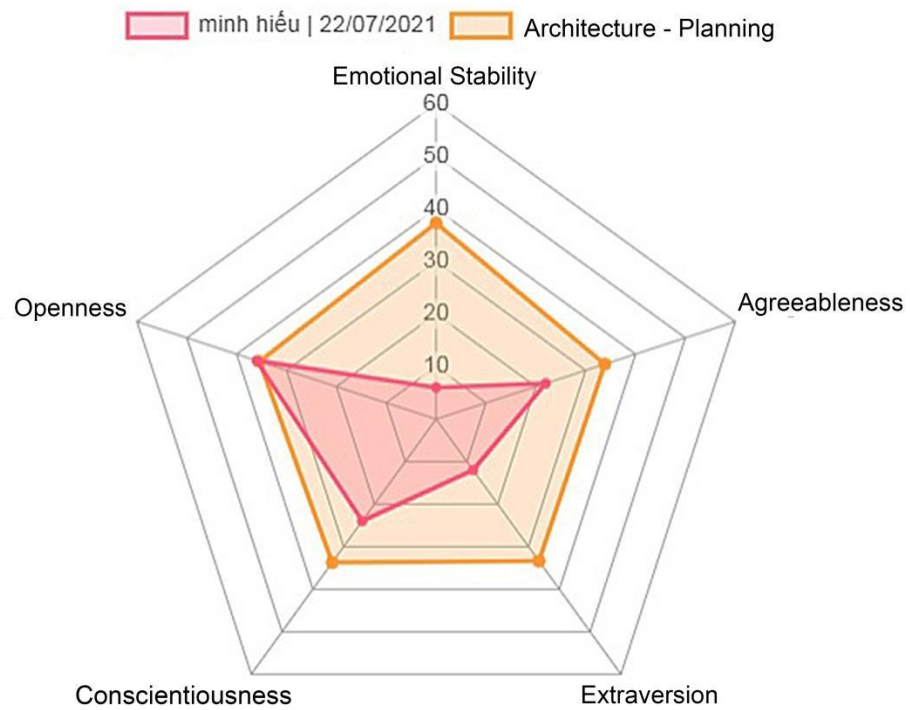**FIGURE 8.** (a) Ha, a 3rd year student whose result showed weakness in terms of Conscientiousness;

FIGURE 8. (b) Compare Ha's result with the average result of the 3rd year students.
Pink zone: Ha's result. Orange zone: Average result of the 3rd year students
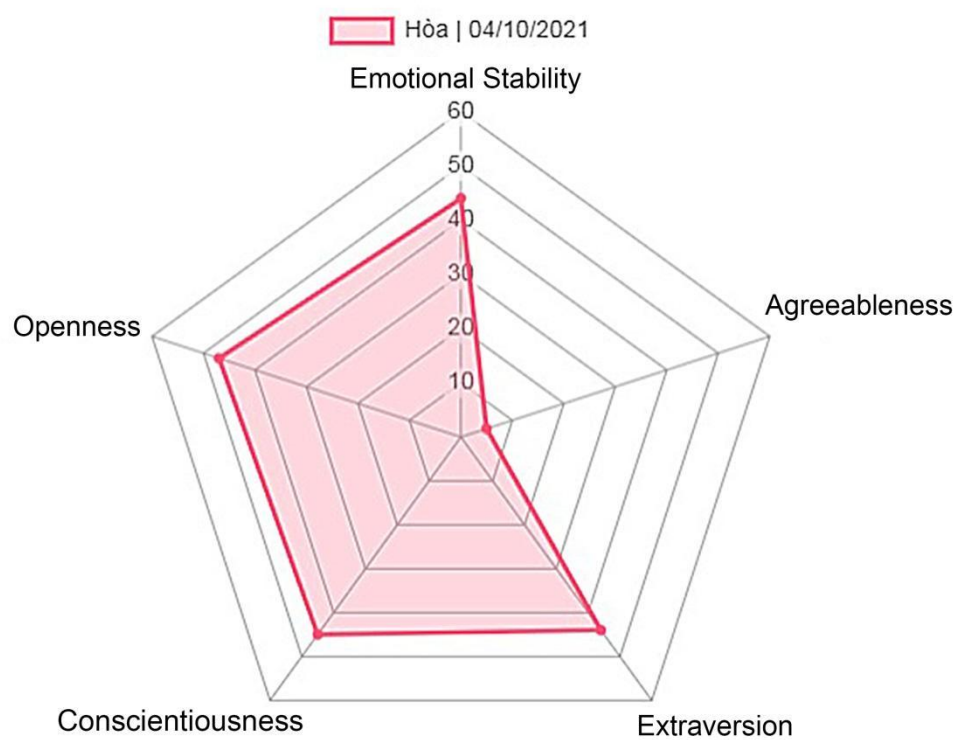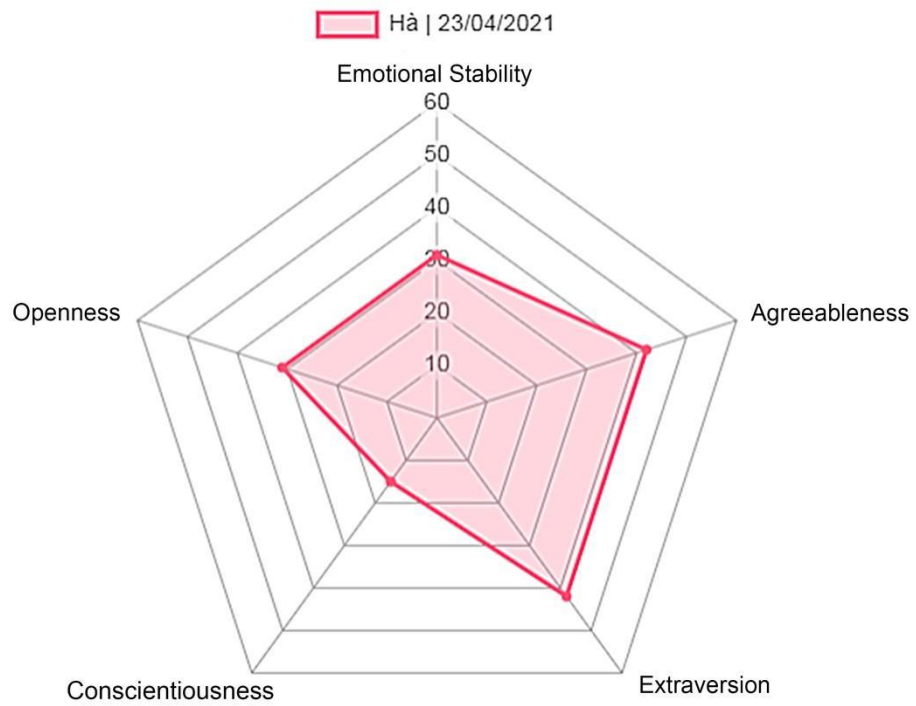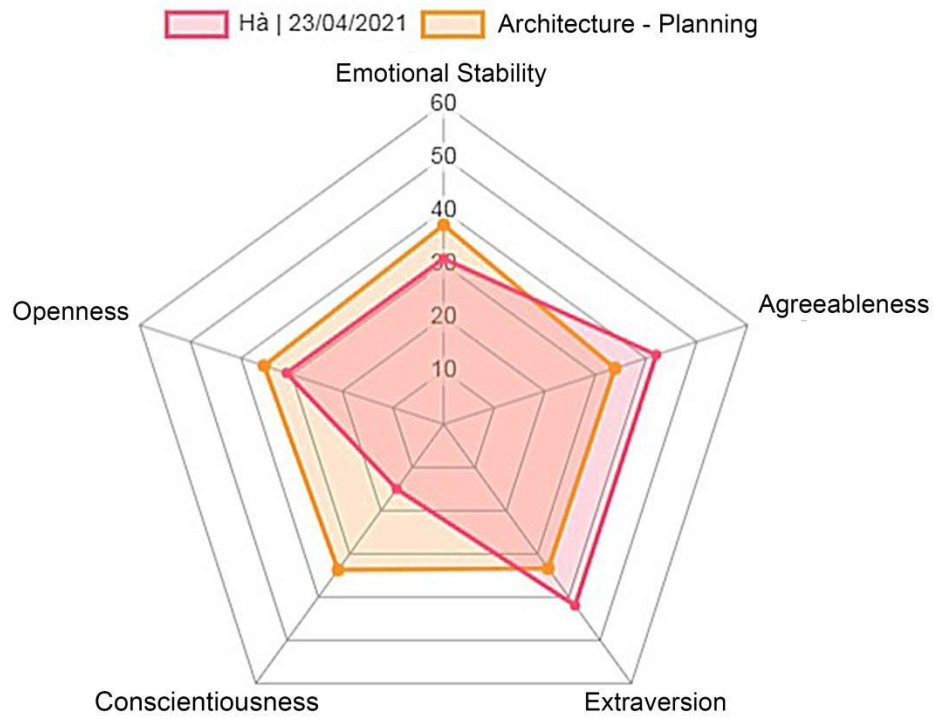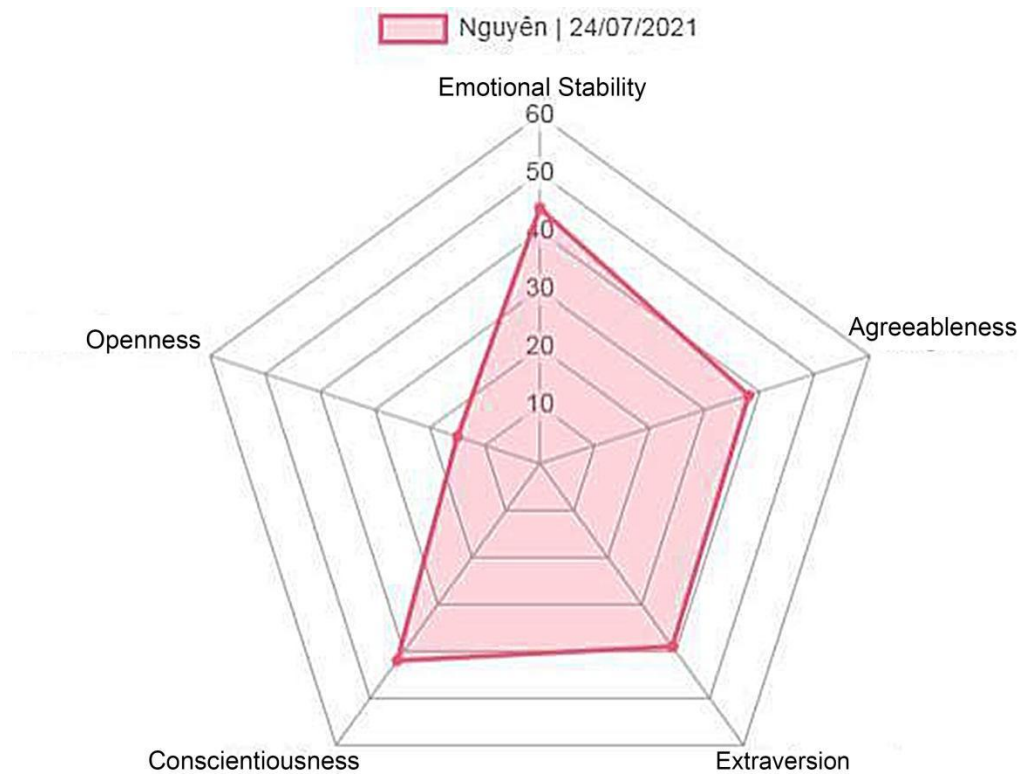
+ Weak in terms of Ready to Experience (Fig. 9).

FIGURE 9. (a) Nguyen, a 5th year student whose result showed weakness in terms of Ready to Experience;
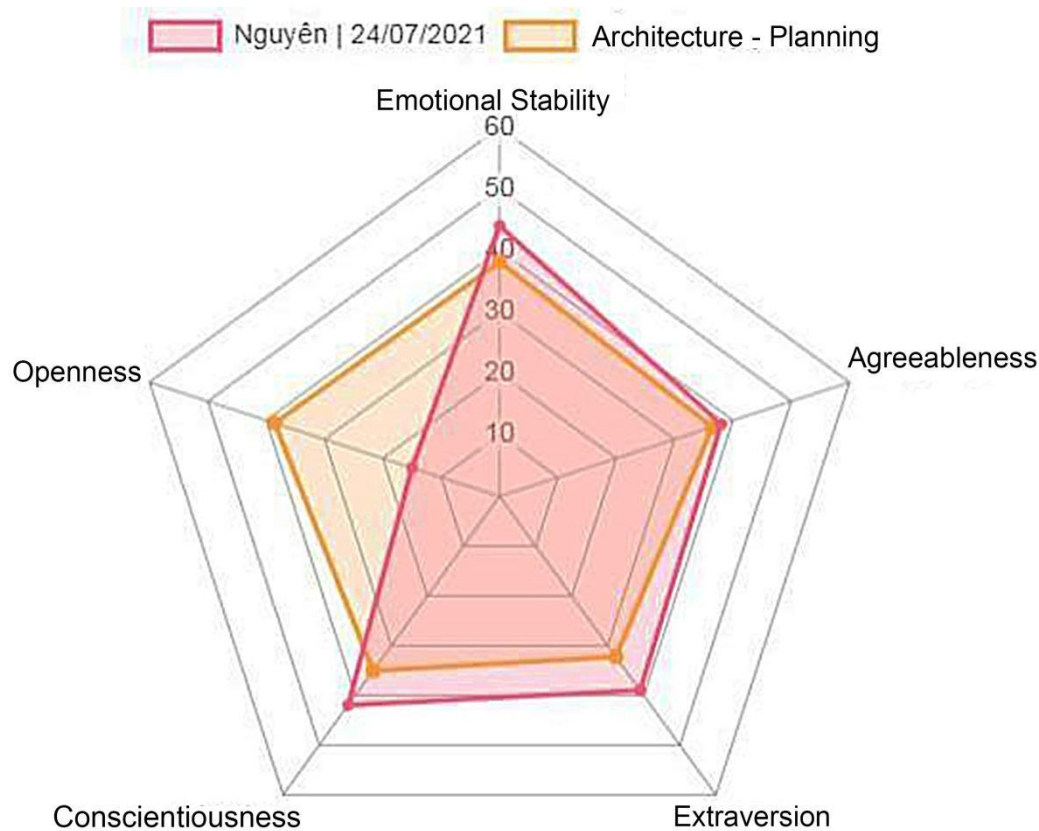
FIGURE 9. (b) Compare Nguyen's result with the average result of the 5th year students.
Pink zone: Nguyen's result. Orange zone: Average result of the 5th year students

Through the test, students know their own strengths and weaknesses. The school, through the test, conducts activities to promote the strengths and improve the weaknesses for students in the form of elective training programs, clubs, training courses, etc. A person can take the test many times, the database stores all the times' results so that the test-taker can track his/her progress and changes over time.

DISCUSSION

Based on the initial personality test results, the research team proposes a data mining direction to create a more comprehensive training environment, especially for engineering schools, including the Hanoi University of Civil Engineering. Proposed training contents:

- Training courses related to Emotional Stability (ES): Overcoming negative emotions; Confidence in yourself; Overcoming failure;
- Training contents related to Agreeableness (A): How to work effectively in groups; Active listening;
- Training contents related to Extraversion (E): Encourage yourself and others; Getting to know new people;
- Training contents related to Conscientiousness (C): Setting goals; Improve labor productivity; Organize work;
- Training contents related to Ready to Experience/Openess (O): Open thinking; Ways to stimulate creativity.
  Suggested training grouping:

Understanding the own personality and that of the team members, and sharing information about the personality among the team members will help them learn how to interact with each other, understand the strengths of each other, thereby allocating tasks and operating the group appropriately.

Random grouping: The grouping will be conducted randomly, grouping based on the student's member selection or purposeful grouping (according to the lecturer's choice). However, before performing the task, the teacher will provide a general information chart related to the personality characteristics of the group members, analyze the advantages and disadvantages of the group then assigning suitable tasks to the group, exploiting the strengths of each individual as well as the group in the process of working.

Some cases may occur when randomly assigning groups/students choose their own group members:

+ Group with members who excel in terms of ES+: A group with many members who excel in terms of ES+ will have negative effects on team performance, as well as interpersonal conflicts, due to often struggle with pressure and stress in the process work implementation. This team desperately needs members with N- and high in terms of E to stabilize the team emotionally, encourage and lead the team to work in a pressurized environment.

+ Group that excels in terms of O: Group with many members who are outstanding in terms of O has the advantage of high creativity, willingness to learn and experience. However, when many members come up with many ideas, it will lead to loss of control due to too many different ideas. This team should have more members who excel in E and N- aspects to lead, control ideas, balance the team and make necessary decisions.

+ The group is dominant in terms of C: In randomization, this is the case where the group has the best chance of success. Team members tend to work according to the system, have high discipline and responsibility at work. They often set goals to achieve achievements in the assigned work, the desire to complete the assigned work in the best way. However, when team members are perfectionist in a specific way, it leads to a loss of control over the progress of the work. This team should need members who excel at E and O to control time, connect and motivate members, and bring more creative ideas.

+ The group that excels in aspect E: A group with many members who excel in aspect E is a group with good leadership skills, is dynamic, creates a lot of positive emotions when working in a group. However, the concentration of many members with leadership skills in the same group sometimes reduces the effectiveness of group work, due to competition for group leadership, conflicts in decisions, leading to group members do not cooperate with each other. This group desperately needs a member present A to stand out, as well as N- to calmly resolve controversial issues, as well as bring the team members together.

+ The group is dominant in aspect A: The characteristic of this group is that many members are sociable, willing to cooperate and please each other. Therefore, group with many members who excel in A often lacks opinions, making it difficult to make decisions quickly. This group needs more prominent E and N- members to support fast, accurate decision making, and to solve difficult problems in the group process.

+ Grouping based on strengths diversity: In a group, a set of students with different strengths to learn from each other. The grouping is purposeful, based on the matching of members, each member has a dominant personality side that sets them apart from the rest. Increasing personality diversity in a team will lead to high work performance. Every member is different distinguished in an important way. The contribution capacity of each group member is the same. Teams with diverse personalities will take advantage of the positive aspects of each individual and minimize their weaknesses.

CONCLUSION

Firstly, the study of student personality and its database is very important and necessary for the training program at universities to be more comprehensive.

Secondly, talaai.com.vn is the first database on student personality in Vietnam. It is suitable for any individuals, any schools, any organizations.

Thirdly, this database contributes to express the general personality picture of students, is the basis for education managers, training program designers, lecturers, teachers, academic advisors to make adjustments in management, education, and training to orient personality for students in the new era, help them to be mentally strong, capable and ready to integrate.

Fourthly, this database is made by Vietnamese people, the questions are customized to suit Vietnamese culture and context, and for the advancement of Vietnamese people.

ACKNOWLEDGMENTS

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