How to Work with Generation Z: Cluster Analysis Based on Emotional Intelligence of University Students

Petra KAŠPAROVÁ* and Ondřej LINHART

Technical University of Liberec, Liberec, Czech Republic, petra.kasparova1@tul.cz; ondrej.linhart@tul.cz

* Corresponding author: petra.kasparova1@tul.cz

Abstract: This paper aims to map the level of emotional intelligence (EI) among Generation Z. The research is based on a questionnaire survey devoted to EI and conducted among second-year bachelor students. The questionnaire is built on the theory of David Goleman, who divides emotional intelligence into five competencies: self-awareness, managing emotions, motivating oneself, empathy and social skills. Based on the results of particular dimensions of EI and gender, 130 students were divided into three subgroups using cluster analysis. From the evaluation of the results, most of the observed sample of Generation Z in general shows high potential in managing and using emotional intelligence. Nevertheless, there are areas that members of Gen Z and (future) managers should focus on. There are especially: managing emotions, getting along with others (social skills), and developing self-motivation.

Keywords: emotional intelligence; Generation Z; cluster analysis

JEL Classification: O15

1. Introduction

Understanding Generation Z (Gen Z) members and working with their emotional intelligence (EI) already play and definitely will play a key role in future managerial work and their appropriate integration into the work process. Individuals of Generation Z were born in 1995 and later and grew up (or still grow up) in a completely different environment than previous generations. And managers and leaders must count on it. Nowadays, managers are expected to do much more coaching than directive management (Fiori & Vesely-Maillefer, 2018). Within leadership, members' high degree of participation in the assigned task is assumed. And the emphasis is placed on well-being when achieving the set objectives. During the entire process, managers must be able to respond flexibly (not only) to the personal changes of subordinates (Grant & Spence, 2010). Coaching has been found to provide emotional support and reduce employee stress. At the same time, it significantly affects achieving goals and increases psychological well-being at the workplace (Theeboom et al., 2014).

However, a large part of the Gen Z members is still studying at universities. Therefore, even teachers can incorporate new approaches and methods of action into teaching. For example, a study published in 2020 investigated the effect of emotional intelligence among university students on their ability to deal with stress. Based on their research, the authors

strongly recommend that professors study the concept of emotional intelligence and methods of stress management in detail in order to be able to provide students with guidance on how to best deal with stress. (Fteiha & Awwad, 2020).

The research presented in this paper examined the emotional intelligence level of 130 university students in November 2022. It was conducted within seminars Introduction to Management among students in the second year of two bachelor study programs: Business Economics and International Economic Relations at the Faculty of Economics of the Technical University in Liberec. All respondents can be included in the so-called Generation Z, which is most often defined by the date of birth after 1995 (somewhere after 1997).

And how to briefly characterize this generation? These young people have already been born into a strongly globalized world, and the primary mean of communication for them is image (the prior generation Y communicates with words, e.g., the previously popular SMS). This generation can boast technological skills and is naturally oriented towards social networks (Machová et al., 2020).

Furthermore, it is precisely this technological progress, so characteristic of the overall development of our society, that contains new realities typical for the growing generation. Generation Z is characterized by a paradoxical feeling of loneliness when people are part of constant online communication but lack personal contact in real life (Seemiller & Grace, 2016). And in a world where devices and robots already perform many repetitive tasks based on artificial intelligence, it is frequently challenging for them to engage emotional intelligence. However, EI represents the main advantage with which fully automated devices can compete (Schuller & Schuller, 2018).

In order to fulfil the goals of this study, the presented paper follows this structure: In the first part, the literature review is devoted to a brief history of the concept of emotional intelligence with an emphasis on Goleman's approach and essential features of Generation Z are also briefly defined. The methodology section presents a selected questionnaire and aptly characterizes the investigated group. The selected statistical method - cluster analysis - is also commented on. Subsequently, the results of the cluster analysis are presented. In the final part - the discussion, proposed recommendations on how to work with individual groups (clusters) are mentioned. Within the defined clusters, the summary points out their strengths and weaknesses and offers possible approaches how to work with particular clusters. At the very end, the authors mention the limits of the presented research and outline future opportunities for further research.

2. Literature Review

Literature search briefly summarizes fundamentals of emotional intelligence and essential characteristics of Gen Z.

2.1. Emotional Intelligence

Emotional intelligence was first recorded in Michael Beldoch's publication, published in 1964. He characterizes EI as the ability to recognize the emotions of oneself and others as well as many other authors. Additional aspects of the art of working with emotions include their

control and adaptation of one's expression according to a given goal or problem solution (Davitz & Beldoch, 1964).

David Goleman is considered the most important promoter and popularizer of emotional intelligence. With his book Emotional Intelligence, he started a discussion about the growing importance of EI. In the title, he questions whether EI is even a more critical component of intelligence than the more well-known and much more comprehensible assessment of intelligence – IQ (Goleman, 1995). Its first edition points to the well-being of both high-IQ and low-IQ people. Based on a new approach to brain research, he indicates the factors that determine overall personal success. He groups them under the term emotional intelligence. According to him, EI includes, among others, self-awareness and impulse control, persistence, enthusiasm and self-motivation, empathy and social dexterity (Goleman, 1995).

Subsequently, as management approaches also changed from a directive one with an emphasis on performance to a more liberal one with an emphasis on people, the term EI appears more and more often in publications. For example, in 1997, the connection between emotional intelligence and stress management was first identified and presented, emphasizing an individual's successful growth and development. The optimal use of EI enables a better understanding of one's feelings and emotions, leading to better self-control, and the given person can manage their actions better (Salovey & Sluyter, 1997).

In the following years, countless authors dealt with the concept, measurement and involvement of emotional intelligence. Regarding the research part of this paper, the division of emotional intelligence into competencies is further characterized, as defined by Goleman in the later edition of his book (2011). EI can be understood as the ability to comprehend and manage our emotions and those around us. These fundamental elements can be subdivided into the following five skills (Machová et al., 2020; MindTools, n.d.; Goleman, 2011):

- Self-awareness primarily means being aware of how one feels in every situation and being fully aware of the responsibility for the actions that one's behavior and emotions can cause. It is essential to know own strengths and weaknesses very well and to be able to use them properly or to maintain humility.
- Self-regulation or managing emotions suppose people are capable of a high degree of self-regulation. In that case, they do not tend to react irritatedly to others, make emotional and hasty decisions or pigeonhole others according to familiar stereotypes. Put, managing emotions is all about maintaining control.
- Self-motivation is critical in achieving personal goals or completing the learning process. As part of team management, it is necessary to set a positive example and thus motivate others. The high standards of one's work are easier to transfer to others.
- Empathy. Individuals with a high degree of empathy can more easily put themselves in someone else's situation. As part of the work process, empathetic behavior enables the personal development of individuals. It provides constructive feedback, and the so-called open-door principle of listening to management-level problems works here.
- Social skills. The most challenging discipline can be described as managing interpersonal relationships. This skill can be honed while gaining experience in interpersonal

communication. Other than through social contact, these abilities cannot be trained. Individuals who are good at emotional intelligence and social skills are excellent communicators. Within the team, they convey both good and bad news and can get others excited about a new project or strategy.

2.2. Generation Z

Several other designations of the generation whose members were born after 1995 (some authors also mention 1997) can be found in publications, for example, post-millennials or iGeneration. However, it most often enters the public consciousness as Generation Z (Dimock, 2019). The naturalness of technological development can be identified as the main feature accompanying almost all studies and comments devoted to Generation Z. Paradoxically, members of Gen Z are often more experienced in using technology than their parents. Thus, there is no traditional transfer of learning from the older generation to the younger. This generation is surrounded and equipped with technological devices from early childhood.

Not only technological progress but also social networks accompany their whole lives. The first Apple was released in 2007, Facebook entered the market in 2004, and many others, such as Instagram, Pinterest and Tik-tok, have gained popularity since then (Berkup, 2020). Therefore, continuous connectivity and constant communication are entirely natural for this generation. The constant supply of new information and the possibility of continuous connection with anyone from anywhere represents a new burden that the new generation has to cope with: multi-tasking, information overload or excessive consumption of online content (Gui et al., 2017). However, compared to the previous generation, they know the pitfalls of spending time online. Almost 60% of users would like to limit their time on social networks, and 38% even consider logging out completely (Deloitte, 2019).

3. Methodology

The main goal of this study is to exploit cluster analysis to point out possible differences between members of Generation Z in emotional intelligence and their subcomponents. Presented research divides respondents into several groups according to gender and self-assessment of skills falling under EI. The research was conducted using a questionnaire based on the theory of David Goleman (2011). He divides emotional intelligence into five competencies: knowledge of one's own emotions (self-awareness), managing emotions, motivating oneself, sensitivity to other people's feelings (empathy), and the art of interpersonal relationships (social skills) (Goleman, 2011).

Based on the above, this study endeavors to answer the following research questions:

1. What is the level of emotional intelligence in the studied sample of Generation Z?
2. How does the level differ in individual EI competencies?
3. Can the research sample be divided into clusters based on gender and EI level?

3.1. Survey

Self-assessment of emotional intelligence was built on a questionnaire based on David Goleman's theory. In total, students responded to 50 statements using a scale of 1-5 where:

- 1 meant that the statement does NOT apply to them,
- 3 meant that the statement is true in approximately half of the cases,
- 5 meant that the statement ALWAYS applies to them.

Respondents then rewrote their scores (1-5) for individual statements in the table. The layout in the table was clearly organized into five columns according to the individual emotional competencies defined by Goleman. Based on the final score, the results can then be interpreted according to Table 1.

Table 1. Interpretation of results

Score	Guide
35-50	This area is a strength for you.
18-34	Giving attention to where you feel you are weakest will pay dividends.
10-17	Make this area a development priority.

The survey involved 130 students, 78 women and 52 men, all aged 20-21. The research was conducted as part of the Introduction to Management course, taught in the second year of the bachelor's study programs Business Economics and International Economic Relations.

The temperament distribution was also examined using the Eysenck test to supplement the general overview of the respondents' character traits. The students were divided into groups according to their level of extroversion and emotional lability (stability). The combination of these two dimensions creates four types of human personality: sanguine, phlegmatic, choleric and melancholic (for more see, for example (Sato, 2005). Table 2 shows the results of the research sample.

Table 2. Distribution of character types in the sample

Temperament types	Total frequency	Relative frequency
Phlegmatic	14	11%
Choleric	30	23%
Melancholic	60	46%
Sanguine	26	20%

3.2. Cluster Analysis

Under the term cluster analysis, it is possible to find a variety (hundreds) of mathematical methods that can be used to find out which objects in a group are similar. Instead of sorting real objects, these methods sort objects described as data. Objects with similar descriptions are gathered into the same cluster (mathematically). The hierarchical methods are most widely applied in research studies (Romesburg, 2004).

Hierarchical cluster analysis is characterized as a sequence of decompositions, where on one side there is a cluster containing all objects and on the other side single element clusters. This method is better applied in finding structures rather than searching for new patterns. Hierarchical clustering can be represented using a binary tree, a dendrogram. Nodes in the dendrogram show individual clusters.

Further subdivision of hierarchical agglomerative methods is based on the criterion according to which the most similar clusters are selected. The complete linkage (furthest neighbor) method is applied in this study. This method combines objects or clusters that are furthest apart within a sorted dataset into a single burst. This means that for the distance of two clusters it takes the greatest possible distance from the distances of every two objects from two different clusters. From the calculated distances, it selects the shortest and connects the corresponding objects. It forms tight clusters of approximately the same size (Kučera, n.d.).

Clustering in the presented study was performed in IBM SPSS Statistics 27 using hierarchical clustering, the furthest neighbor method.

4. Research Results

The graphic result of the cluster analysis can be found in the literature under the term dendrogram. This diagram demonstrates a hierarchical relationship between objects. Therefore, it belongs to the most common outputs from hierarchical clustering. Working from the bottom up, the dendrogram shows the sequence of joins that were made between clusters. Lines are drawn connecting the clusters that are joined at each step, while the vertical axis displays the distance between the clusters when they were joined (Statgraphics Technologies, n.d.).

According to the dendrogram, the best way to allocate objects into clusters can be found. One option for determining the optimal number of clusters is, thus, using a graphic representation – a dendrogram (Cichosz, 2015). A dendrogram representing the obtained data is shown in Figure 1.

Figure 1. Dendrogram of obtained data
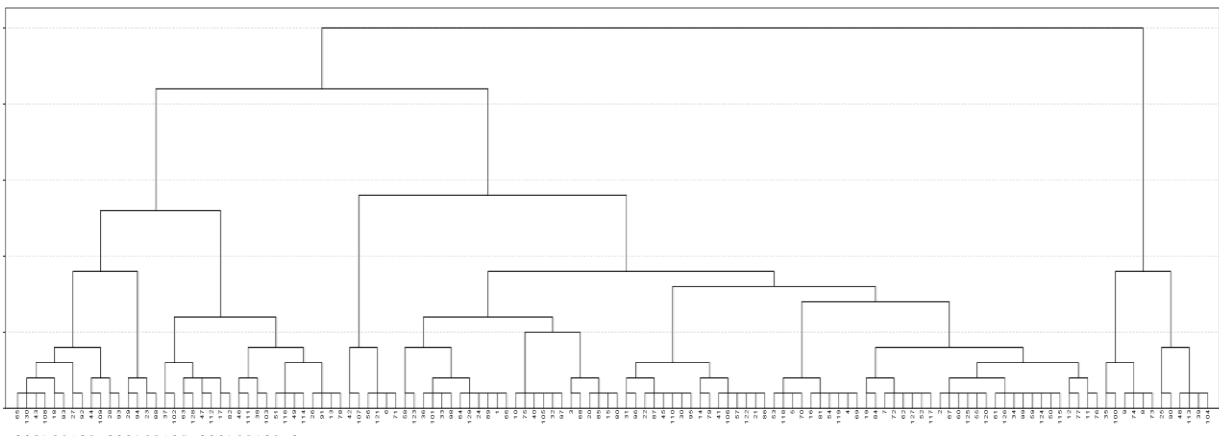
The objects were clustered according to 6 variables: gender and the final score (0-50) for the five EI competencies obtained in the questionnaire survey. Due to the number of respondents and the data analysis, the variant with 3 clusters was found to be the most suitable. Table 3 contains the frequency of both sexes and the average values of self-assessment in individual components of EI.

For better clarity and interpretation of the results, the individual values were converted into verbal expressions according to Table 4, resulting from the used questionnaire toolkit. Table 4 summarizes the outputs.

Table 3. Averaged values of EI for each cluster

Clusters	Female	Male	Self-awareness	Managing emotions	Motivating oneself	Empathy	Social skills
1	50	32	37.6	27.5	29.5	35.8	31.6
2	6	6	27.2	28.7	31.5	28.8	22.2
3	22	14	36.0	33.5	36.8	39.4	35.8
Σ/Ø	78	52	36.2	29.3	31.7	36.2	31.9

Table 4. Results of cluster analysis in verbal expression

Clusters (Nr. of objects)	Female	Male	Self-awareness	Managing emotions	Motivating oneself	Empathy	Social Skill
1 (82)	50	32	Strength	Giving attention	Giving attention	Strength	Giving attention
2 (12)	6	6	Giving attention	Giving attention	Giving attention	Giving attention	Giving attention
3 (36)	22	14	Strength	Giving attention	Strength	Strength	Strength
Σ/Output	78	52	Strength	Giving attention	Giving attention	Strength	Giving attention

5. Discussion

In the first phase of the research, the main intention was to examine the general level of emotional intelligence among the respondents and, subsequently, the level of EI in individual competencies. Based on the results summarizing values across all clusters, the strengths of EI in the studied sample of generation Z can include the ability to self-control and empathy, i.e. the ability to empathize with the feelings of others quickly. These competencies were equally rated at 36.2. The other three areas of EI should be paid attention to by members of Generation Z when trying to develop themselves.

Overall, emotional intelligence training should become a fixed part when setting educational goals. The average EI level reached a value of 33. The results correspond with similar research conducted in 2019 in Slovakia and Hungary. It was found that although Generation Z considers emotional intelligence more important than the cognitive component, it still shows lower emotional intelligence than their older (Baby Boom, Generation X and Y) counterparts (Machová et al., 2020). The variance between moderate and high levels of EI was also measured in study conducted among Indian university students. It was carried out in 2019 and examined a selected sample according to gender, age, place of residence (city x rural) and type of study (Kant, 2019).

The third research question dealt with the possible division of the studied sample into several groups. The evaluation of the individual clusters shows that, although in the strongest cluster No. 3 (in terms of measured EI level), where 4 out of 5 components of emotional intelligence can be described as a strength, the members of this group still have to work on their control of emotions. This information is also crucial for managers, future leaders and teachers. They must remember the importance of working with this sub-area with their new young subordinates, recent graduates or students.

In the numerically most robust cluster No. 1 (82 members), efforts to better manage interpersonal relationships also come to the forefront of the development activities. It corresponds to a weaker level of emotion management across all clusters. These two categories in targeted training can be linked so that managing one's emotions contributes to better relationships and dealings with other team members. Last but not least, for members of this group, managers must pay attention to developing their motivation. It is where the much sought-after coaching style should come into play, as presented in the introduction. It focuses on people as individuals and not on the performance itself. It thus motivates workers or students to get involved and engaged in a given project or task (Theeboom et al., 2014).

The greatest attention and interest of superiors regarding the EI progress should be directed towards cluster 2. Emotional intelligence does not reach the level of strength in any of the measured competencies. Nevertheless, the good news for management is this cluster's total number of members. In the examined sample, only 12 respondents, i.e. less than 10% of the respondents, were included. Individuals in this narrow group show the highest level of EI (31.5) within the self-motivation skill. However, getting along with other people is their most serious difficulty. In this case, managers can consider assigning separate tasks and gradually integrating them into the team.

6. Conclusion

The presented paper aimed to evaluate the current level of emotional intelligence in the emerging and work-starting generation – GenZ. Possible areas of analysis were identified using three research questions. Regarding the first of these: *What is the level of emotional intelligence in the studied sample of Generation Z?* based on the evaluation of the Goleman test, authors conclude that a large part of generation Z shows a high potential in managing and using emotional intelligence. However, the average value of 33 (out of a maximum of 50) indicates the requirement for further training and education. The second research question sought an answer to which components of emotional intelligence to focus on in personal development: *How does the level differ in individual EI competencies?* Thanks to a more detailed analysis, it was feasible to define areas with a higher priority: managing emotions, self-motivation and interpersonal relationships. On the other hand, the strengths of the studied sample included self-awareness and empathy.

The final third question examined the possibility of dividing the members of Generation Z into homogeneous groups: *Can the research sample be divided into clusters based on gender and EI level?* Within cluster analysis, three significant homogeneous groups showing very similar characteristics were defined. These were explicitly presented for individual clusters. The main outputs of the work were able to answer all the set questions. However, several other options exist for following up on the presented study.

This essential pilot research can be followed up by expanding the examined sample to other university fields and adding variables such as current workload, family circumstances or place of residence. Therefore, the narrow focus of the analysis can be considered as a limit of the presented research. Despite this, it helped get an initial idea of the current generation's

EI level. As for the research itself, in the future, the authors can concentrate on individual EI competencies and, for those with the lowest measured levels, suggest possible methods and approaches to improve these values among members of Generation Z.

References

Berkup, S. B. (2020). Working With Generations X And Y In Generation Z Period: Management Of Different Generations In Business Life. *Mediterranean Journal of Social Sciences*, *5*(19), 218 https://doi.org/10.5901/mjss.2014.v5n19p218

Cichosz, P. (2015). *Data Mining Algorithms: Explained Using R*. John Wiley & Sons.

Davitz, J. R., & Beldoch, M. (1964). *The communication of emotional meaning*. McGraw-Hill.

Deloitte. (2019). *Societal discord and technological   transformation create a "generation disrupted"*. https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/deloitte-2019-millennial-survey.pdf

Dimock, M. (2019, January 17). *Defining generations: Where Millennials end and Generation Z begins*. Pew Research Center. https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/

Fiori, M., & Vesely-Maillefer, A. K. (2018). Emotional Intelligence as an Ability: Theory, Challenges, and New Directions. In K. V. Keefer, J. D. A. Parker, & D. H. Saklofske (Eds.), *Emotional Intelligence in Education: Integrating Research with Practice* (pp. 23–47). Springer International Publishing. https://doi.org/10.1007/978-3-319-90633-1_2

Fteiha, M., & Awwad, N. (2020). Emotional intelligence and its relationship with stress coping style. *Health Psychology Open*, *7*(2), 2055102920970416. https://doi.org/10.1177/2055102920970416

Goleman, D. (1995). *Emotional intelligence*. Bantam Books. http://catdir.loc.gov/catdir/enhancements/fy0665/95016685-b.html

Goleman, D. (2011). *Emoční inteligence*. Grada Publishing.

Grant, A. M., & Spence, G. B. (2010). Using coaching and positive psychology to promote a flourishing workforce: A model of goal-striving and mental health. In *Oxford handbook of positive psychology and work* (pp. 175–188). Oxford University Press.

Gui, M., Fasoli, M., Carradore, R., & Carradore, R. (2017). "Digital Well-Being". Developing a New Theoretical Tool For Media Literacy Research. *Italian Journal of Sociology of Education*, *9*(1), 155–173. https://doi.org/10.14658/pupj-ijse-2017-1-8

Kant, R. (2019). Emotional intelligence: A study on university students. *Journal of Education and Learning (EduLearn)*, *13*(4), 441–446. https://doi.org/10.11591/edulearn.v13i4.13592

Kučera, J. (n.d.). *Hierarchické metody*. Retrieved May 6, 2020, from https://is.muni.cz/th/172767/fi_b/5739129/web/web/hiermet.html

Machová, R., Zsigmond, T., Lazányi, K., & Krepszová, V. (2020). Generations and Emotional Intelligence A Pilot Study. *Acta Polytechnica Hungarica*, *17*(5), 229–247. https://doi.org/10.12700/APH.17.5.2020.5.12

MindTools. (n.d.). *Emotional Intelligence in Leadership—Learning How to Be More Aware*. Retrieved January 6, 2023, from https://www.mindtools.com/ax3ar6w/emotional-intelligence-in-leadership

Romesburg, H. C. (2004). *Cluster analysis for researchers*. Lulu Press.

Salovey, P., & Sluyter, D. (Eds.). (1997). *Emotional Development And Emotional Intelligence: Educational Implications*. Basic Books.

Sato, T. (2005). The Eysenck Personality Questionnaire Brief Version: Factor structure and reliability. *The Journal of Psychology*, *139*(6), 545–552. https://doi.org/10.3200/JRLP.139.6.545-552

Schuller, D., & Schuller, B. W. (2018). The Age of Artificial Emotional Intelligence. *Computer*, *51*(9), 38–46. https://doi.org/10.1109/MC.2018.3620963

Seemiller, C., & Grace, M. (2016). *Generation Z Goes to College*. John Wiley & Sons.

Theeboom, T., Beersma, B., & van Vianen, A. E. M. (2014). Does coaching work? A meta-analysis on the effects of coaching on individual level outcomes in an organizational context. *The Journal of Positive Psychology*, *9*(1), 1–18. https://doi.org/10.1080/17439760.2013.837499