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LEARNING AS PART OF KNOWLEDGE EXCHANGE PROCESSES IN THE CONTEXT OF ONLINE WORK, BASED ON THE EXAMPLE OF GENERATION Z EMPLOYEES

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Purpose: The objective of the argument in this paper is to attempt at answering the question whether learning and knowledge exchange are the key factors determining online work preferences for Generation Z employees.
Design/methodology/approach: The essence of knowledge management is that all knowledge, both explicit and tacit, accumulated by an organization becomes easily accessible to each of its members. This is important for decision-making processes and allows the organization to become more agile. Knowledge management is most often associated with modern information technologies. Thanks to them, streams of various data can be processed and analyzed in many different ways. However, in the literature there is an increasingly common attitude that more attention should be paid not only to the technological but also to the human aspect of knowledge management. The processes of knowledge exchange among employees have been subject to extensive research and studies, yet the recent years have added another thread to the discussion about the matter, i.e. a significant proportion of employees switching to the online work model. Based on the findings of the studies conducted on a group of employees representing Generation Z, the Principal Component Analysis (PCA) technique was applied to organize the factors with the highest relevance for the respondents in online work.
Findings: PCA demonstrated that the components recognized as most important were those relating to knowledge transfer and their impact on employee efficiency, and on the other hand employee relations as a factor that supports the learning processes.
Research limitations/implications: In order to dwell upon the underlying causes of this situation, it should be recommended to proceed with further in-depth qualitative research.
Practical implications: What the research communicates to the organization is that although Generation Z members are aware of the significance of the knowledge transfer and learning processes and they understand the role of peer relations in these processes, they are unable to overcome the social barriers created by the online working system due to lack of appropriate skills.
Originality/value: The paper reveals new aspects that play crucial role in shaping Generation Z attitude to online work from one side. On the other hand it also helps to design synthetic tool researching this area in the future.
Keywords: knowledge, learning, online work, Generation Z, PCA.
Category of the paper: Research paper.

1. Introduction

Nowadays several articles have been written on the characteristics and personal traits of Generation Z members, their values (Maloni et al., 2019; Cresnar, Nedelko, 2020), their attitudes to work and organizations (Barhate, Dirani, 2021), their adaptation to the workplace (Chillakuri, 2020), and also the similarities they share and the differences that distinguish them from other generations (Hernaus, Poloski Vokic, 2014; Klopotan et al., 2020; Mahmoud et al., 2021), especially from Generation Y (Raslie, Ting, 2021). Adaptation to the workplace is necessary for all the different generations to collaborate, which adds extra difficulty to human resources management (HRM) in order to ensure the efficient workflow at the workplace (Benítez-Márquez et al., 2021). In recent years, Generation Z members have entered the labor market, but their entry was aggravated by the COVID- 19 pandemic and its effects on the economy, society and the labor market (Sakdiyakorn et al., 2021). Despite the pandemic and the consequent economic downturn, Generation Z has high expectations about their work (Snieska et al., 2020), with a well-defined career development plan (Barhate, Dirani, 2021).

As a consequence of advanced technology development, work can more frequently be done outside the workplace and can be distributed, specifically in the geographic sense. This has been demonstrated by the COVID-19 pandemic when employees were transferred to online work wherever possible (Mueller-Langer, Gómez-Herrera 2022; Nejman, Sadłowska-Wrzesińska, 2019). Online work has developed into an aspect of operating cost control, as has outsourcing; yet, organizations are now showing a stronger tendency to realize its negative aspects, particularly in respect of employee well-being and performance (Ishii et al., 2023; Morikawa, 2023). On the other hand, employee preferences regarding online work are increasing, even if this working model involves an average 7% decrease of their wages (Lee, 2023).

Due to the epidemic and generational changes, we observe re-evaluations regarding expectations for work and career, which appeared within a relatively short time (Green, 2022). Transformations in the labor market related to various forms of work performance, new pension solutions allowing for early retirement, as well as the mass entry of the youngest generation of employees, called "Generation Z" into the labor market (Rodriguez et al., 2019; Bencsik, Machova, 2016; Bencsik et al., 2016), create risks associated with irreversible loss of unique organizational expertise that cannot be replaced by external knowledge (Bloodgood, Chen, 2021; Mahnke et al., 2009; Timiyo, Foli, 2023; Ritala et al., 2015). Some knowledge leaks out from the organization, especially the part involving the core work, which is often underestimated (Hans et al., 2023). There is a need to employ people with slightly different competences, such as extraordinary intelligence, communication skills, the ability to solve problems or interpret information (Caratozzolo et al., 2023). Generation Z is said to be enticed by work flexibility and work-life balance. They are characterized by entrepreneurial mindset,

they appreciate honesty, face-to-face communication, initiative and social responsibility (Randstad Canada, 2014). At the same time, the demand for knowledge is changing at a significant pace – some of this knowledge becomes outdated and some is significantly underestimated. Employees must constantly update their qualifications and continuous learning is becoming a standard. For Generation Z, any negative feedback or failure is an important step towards innovation, learning and higher job performance. What seems to be a response to the knowledge demand variability is the agility in the process of intra-organizational knowledge propagation. Specifically, it is the development of a contact network for quickly locating the needed knowledge and its smooth transmission. In the context of the presented economic, social and demographic transformation, the authors defined the objective of their arguments in this paper as an attempt at answering the question whether knowledge exchange is the key factor determining online work preferences for Generation Z employees.

2. Learning as part of knowledge management

Currently, the importance of knowledge, both for the organization and for individual employees, finds its manifestation in the redefinition of a number of management concepts. Knowledge is a term that is becoming increasingly difficult to grasp in terms of its essence. It goes far beyond what is collected in books. The definition of the term is currently being discussed by philosophers, psychologists and specialists in the field of management or IT (Dreesens et al., 2020). As an intangible resource, it is difficult to measure and its value is revealed only when we realize what we want to know and only when we need to know. New knowledge can come to our minds unexpectedly, as a consequence of associating different, seemingly not convergent, types of knowledge or information, but we often have no control over this process close to "enlightenment". The COVID-19 outbreak also resulted in the transformation of educational practices quickly to guarantee learning continuity (Casado-Aranda et al., 2021; Usher et al., 2021).

Boydell (Evans, 2005, p. 30) distinguishes four types of knowledge: what it is, how to do it, how to become oneself, how to achieve goals in cooperation with others, and three levels of knowledge: how to put it into practice, how to improve it, and how to combine it. Davenport and Prusak (2000) define knowledge as a fluid composition of focused experience, value, useful information and expert perspective, providing a basis for evaluating and assimilating new experiences and information. On the organizational level, an interesting division of knowledge (sustaining the socio-psychological perspective) is represented by Evans (2005, pp. 31-33). Evans divides knowledge into four types: I know what (operational knowledge), I know how (it is also a kind of operational knowledge consisting of our experience of how something works

and how something is done), I know why (the definition of work, its meaning), I know who (discernment of who is who and what knowledge they have).

One of the objectives of knowledge management is to produce and distribute knowledge in order to facilitate access to resources, particularly human resources and to create an environment that promotes knowledge generation, sharing, learning, enhancement, organization, and utilization for the benefit of the organization and its employees (Graczyk-Kucharska, 2019). Technology and personnel needs are changing along with the world's ongoing changes. In today's organization, effective human resource management is crucial. Nieves, Quintana, and Osorio (2016) in their study analyze two theoretical approaches: HRM and perspective of knowledge.

Knowledge management can also been interpreted as an integrated approach by which data assets of an organization are found, recorded, analyzed, retrieved, managed, and shared (Cui et al., 2019). These assets refer to databases, records, regulations, procedures, as well as employees' skills and experiences (Idrees et al., 2023). Employees are able to perform their duties at work more efficiently if they share their expertise (Haider et al., 2023).

Thus, knowledge management should also focus on the learning process, including mutual learning (Akhmadi, Tsakalerou 2022). This process is a condition for the transfer of knowledge between employees, most often latent knowledge (Kamei and Ashworth 2023). To have it unveiled, we need a favorable, stress-free (Sadłowska-Wrzesińska, Piosik, Nejman, 2022) environment for the exchange of knowledge, because a person cannot be forced to share knowledge, nor can they be forced to accept new one. In today's organizational reality, therefore, the competence to learn and teach others effectively comes to the fore.

3. Methodology

The research findings presented in this paper are a part of a quantitative survey on the "Leadership aspects of online work management", which was conducted among young Generation Z representatives working online. The survey was conducted in December 2022.

This paper presents a fragment of the study findings concerning the respondents' opinions on the impact of online work on the learning and knowledge exchange processes.

The study was conducted with quantitative research methods involving the survey technique. The study covered young people representing Generation Z, having the experience with online work covering at least the year 2022. The classification which is most popular in literature defines Generation Z as persons born after 1995, although some researchers may include those born in 1990 in this group, whereas in other approaches the group only includes the people who were born in 2000 or later (Dreyer, Stojanová, 2022; Skýpalová et al., 2023; Urick et al., 2017).

Because there are no statistics of the number of online workers in Poland, the main focus is on the group of young, economically active people. On the basis of Rocznik Statystyczny Pracy 2021 (Employment Statistics Yearbook 2021), the population of the employed in Poland, aged 15-34 (which is the age range of interest for the researchers) was established at 4802 thousand people. The gender and age structure of the studied population is presented in Table 1.

Table 1.
Age and gender structure of the study group

Age groups	Population total '000 % of the population	Female '000 % of the age group	Male '000 percentages for the population	Sample size	Female sample size	Male sample size
15-24	917 19.09%	357 38.93%	560 61.07%	73	28	45
25-29	1761 36.67%	760 43.16%	1000 56.84%	141	61	80
30-34	2124 44.23%	928 43.69%	1196 56.30%	170	74	96
Total	4802	2045	2756	**384**	163	221

Source: own research.

For the population estimated as shown above, with the following statistical assumptions: fraction size: 0.5; confidence level: 95%; maximum error: 5%, the sample size was defined as a population of 384.

The survey was carried out with the use of quantitative research methods, involving CATI (Computer Assisted Telephone Interview – 50% respondents) and CAWI (Computer-Assisted Web Interview – 50% respondents).

2783 online workers were contacted. Some of them refused to take part in the survey, others did not qualify in terms of the study criteria (e.g. not having the experience with online work during 2022), otherwise specific age or gender groups were full.

The research assumption being the experience of online work in 2022 was intended to eliminate the group of employees whose work system was based on the online model only because of the COVID-19 epidemic. Those employees would typically carry out their tasks and responsibilities on the basis of extraordinary procedures, diverging significantly from the online work conditions defined in literature, the first and foremost of which is the voluntary choice of this particular working model. Hence, the opinions of respondents who were forced to work online because of certain external circumstances could lead to false conclusions about their attitudes and believes.

Ultimately, 387 correctly filled surveys were obtained (excess surveys do not disrupt the planned population sample structure.

The research instrument was a standardized survey composed of 57 closed-ended statements and 8 questions about the respondents' social and demographic characteristics. Likert scaling was applied to the responses (the Likert scale method can be used to determine the relative intensity of the various answers (Babbie, 2004, p. 192)). The research instrument (survey) is a proprietary tool developed by members of the research team – the Czestochowa

University of Technology, Faculty of Management, Department of Applied Sociology and Human Resources Management staff.

PCA (Principal Component Analysis), which was used to process the study findings, is among the most popular statistical techniques within the factor analysis practice, used to analyze the behaviors and attitudes of respondents (Nardo et al., 2005; Pupelis, Šeinauskienė, 2023). The analysis was conducted with Statistica software.

4. Principal Component Analysis method

Empirical research in the field of management studies requires specific research tools. Building questionnaires is a process in which the researcher has to balance the focus on maximizing the information obtained through the study and the research efficiency. Increasing numbers of survey questions coincides with decreasing levels of readiness to take part in a study and, in the case of surveys executed through the online channel or by phone, an increasing tendency to terminate the survey (Kaczmarek, 2016). Considering the relatively short time which respondents are willing to devote to participation in a survey, the structure of the research instrument needs to be precisely conceived (Kaczmarek, 2013). Where the Likert scale is used in a questionnaire, it seems equally important to consider the number of statements used; with excessive number of test items, measurement quality will deteriorate as a consequence of such incidents as random answers given by respondents wanting to end their study participation as soon as possible. On the other hand, where an insufficient number of statement is generated, certain significant aspects of the studied issue may be disregarded (Kaczmarek, 2016). Attempts at resolving the issue with the number of test items for the Likert scale are undertaken in the form of reliability analysis, typically using Cronbach's alpha.

Yet the real challenge for the researcher is studying phenomena having multiple aspects. For these studies, multidimensional analysis will establish the relationships between variables in a dataset or the relationships between the objects defined by these variables (Walesiak, 2006). By applying the Principal Component Analysis, researchers are able to reduce large volumes of data to a small number of complex dimensions called components (Sztemberg-Lewandowska, 2017). Principal components are distinguished so that the first one explains the most variance of the input variables, the next one explains the most of total variance in what is left after the first component, etc. The number of principal components needed to explain all the joint variance of the studied variables equals the number of the variables, yet the most common practice is to consider a few initial components which will explain most of the overall variance of the input variables. A solution in which the components explain >60% of all the variation can be considered acceptable (Kaczmarek, 2016), although there are mentions of 80% or even 90% requirements (Górniak, 1998).

The analytical procedure for the Principal Component Analysis method is well presented in subject-matter literature, particularly in the field of psychological and social studies methodology (Capecchi et al., 2023; Lloyd et al., 2023; Nardo et al., 2005; Okóń, 1968); nevertheless, it is reasonable to present its key assumptions and analytical tasks, comprising the following (Kaczmarek, 2016):

1) Selection of variables for analysis.
2) Defining a correlation matrix and eliminating uncorrelated variables.
3) Identifying the factors and their rotation.
4) Interpretation of results.

Principal Component Analysis requires the availability of variables measured on an interval scale, yet it is permitted to apply it to measurements on five-point or seven-point ordinal scales (Sagan, 2004, p. 89).

Analysis of the correlation matrix plays an important part in adequate selection of variables. A prerequisite for a methodologically correct application of this technique is that uncorrelated variables are eliminated. Before setting the correlation matrix, it should be verified whether the data under consideration has adequate statistical properties, specifically a non-zero standard deviation and the Kaiser–Meyer–Olkin (KMO) test value, i.e. the product of the correlation coefficients for the variables and the partial correlation coefficients for these variables. KMO value is the measure of sampling adequacy of variables. It is used to test whether partial correlation coefficients of the analyzed data are low. The value range is from 0 to 1. The higher the value, the greater the existing correlations of the variables. A KMO value below 0.5 challenges the suitability of Principal Component Analysis.

Another problem faced by the researcher is the determination of the number of components, which are usually called factors in PCA, like in other factor analysis techniques. This decision is arbitrary, yet multiple criteria exist that may assist the decision process. The most popular of those are (Kaczmarek, 2013):

- Kaiser's eigenvalue criterion – the eigenvalue of each principal component is presumed to be >1, i.e. higher than the variance of a single variable;
- Cattell's scree test criterion – eigenvalues are presented as a scree plot and the components to retain are those forming the slope, while the scree components are ignored.

In the next step, to facilitate the interpretation of the developed solution, the factors (principal components) are rotated so that every variable has a high loading only in one factor (component), while the latter has at least a few near 0 loadings and a few near 1 or near -1 loadings.

As we know the wording of the statements used in the questionnaire, we can undertake a content analysis, i.e. naming the defined factors. Where Principal Component Analysis is applied to determine the dimensionality and uniformity of the scale, an additional step for the researcher is to eliminate items weakly correlated to others measuring the same property.

In this way, both the points which are not specific to any factor and show equally strong correlation to two or more factors and the points weakly correlated to all factors can be eliminated from a scale composed of multiple statements.

5. Principal Component Analysis - findings

According to the method algorithm presented earlier, the analytical procedure aimed at determining the dimensionality and uniformity of scale included the following actions.

Step 1 – selection of variables for analysis. The analysis covered 57 variables. The following scale was used in the responses: 1 – completely disagree, 5 – completely agree. Four questionnaire validity procedures have been used: content (Rossiter 2008), face (Czakon, 2014), construct (Cronbach, Meehl, 1955) and nomological (Czakon, 2014) ones. The scale reliability was validated using Cronbach's alpha that is a measure of internal consistency ($\alpha = .970019$).

During the questionnaire construction phase, the points on scale were divided into segments by topical area. The knowledge/information/learning area is presented in Table 2.

Table 2.
Factors to assess opinions on online work in the context of knowledge transmission, information and learning

Question ref.	Online work
m8[17]	Forces you to learn to use new technical solutions
m8[18]	Involves independent problem solving
m8[19]	Facilitates rapid exchange of information
m8[20]	Fosters understanding of communicated data
m8[21]	Leads to overburdening with data
m8[22]	Makes it easier to evaluate whether certain information is true
m8[23]	Facilitates learning from your peers
m8[24]	Streamlines learning new things
m8[25]	Facilitates explaining new knowledge more effectively to other employees
m8[26]	Supports gathering and documenting personnel knowledge
m8[27]	Enables you to learn from more experienced employees
m8[28]	Facilitates identification and location of people having the desired knowledge
m8[29]	Encourages you to search for information/knowledge among peers
m8[30]	Facilitates knowledge transfer from the superior

Source: Own research.

A graphic presentation of the respondents' answers distribution across the studied area is shown on Figure 1.

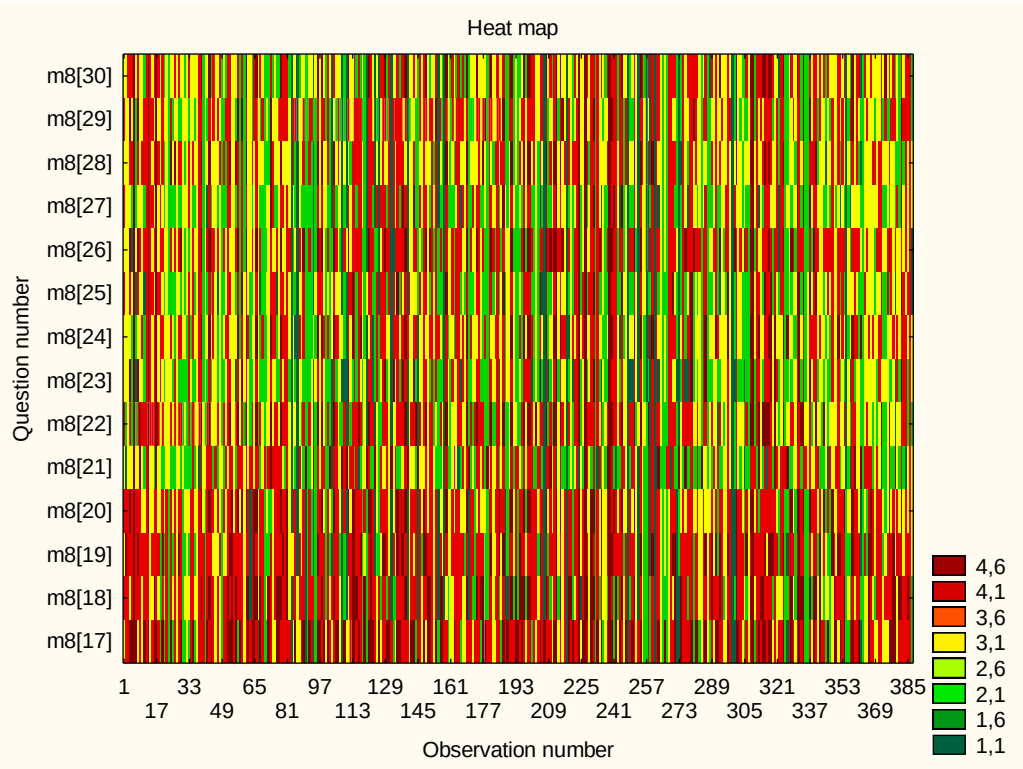

Figure 1. Heat map – online work in the context of knowledge transmission/information/learning (response scale 1-5).

Source: Own research.

The presented heat map shows that the respondents were generally in agreement with statements on remote work forcing them to learn to use technical innovations, solve problems independently, facilitating quick communication, fostering understanding of communicated data, gathering and documenting staff knowledge. At the same time, the respondents would rather disagree with the statements on remote work leading to data overburden, fostering learning from peers, enabling better explanation of new knowledge to other employees or facilitating learning from more experienced employees.

Step 2 – defining a correlation matrix and eliminating uncorrelated variables. The correlation analysis was preceded with an assessment of the values of generated descriptive statistics, particularly the standard deviation. Non-zero values of standard deviation were obtained in both measurements for all the variables. Based on correlation analysis, two statements were eliminated from the dataset of 57 statements: "online work leads to a feeling of isolation" and "online work puts an emphasis on communication in writing (e-mails, text messages, etc.)". Few statistically significant correlations were present for these variables. Based on the obtained KMO (Kaiser-Meyer-Olkin) value of 0.968 and near-zero Barlett sphericity test result for 55 variables, a positive decision was undertaken on the suitability of principal component analysis for clarifying the correlation matrix structure.

Step 3 – identifying the factors and their rotation. After conducting the Scree test (Figure 2) and applying the Kaiser eigenvalue criterion, 7 factors (components) were distinguished which explain 72.23% of all the variance (Table 3).

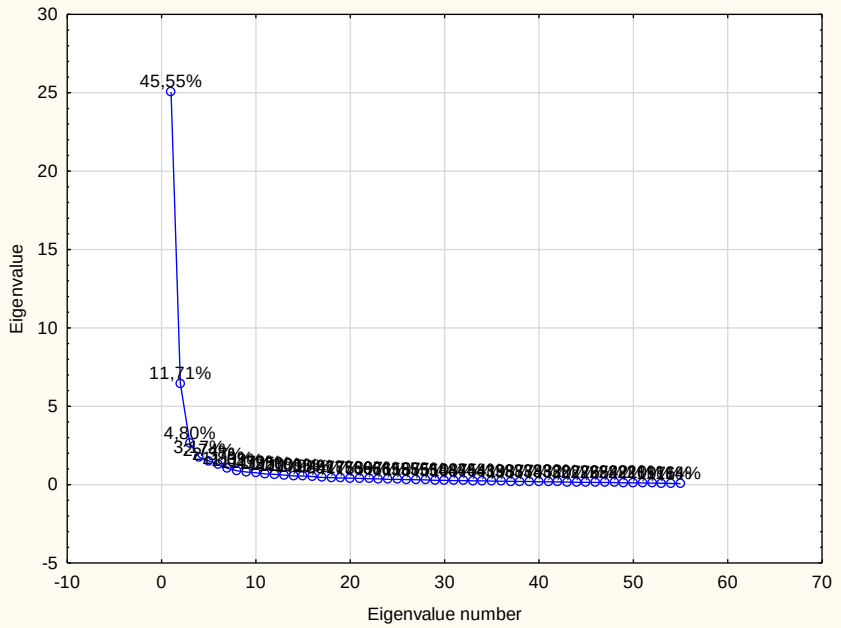

Figure 2. Scree graph.

Source: Own research.

Table 3.

Defined principal components indicating the key dimensions of online work

Component number and name	Eigenvalue	% of all variance	Cumulative eigenvalue	Cumulative percentage
1. knowledge, information and efficiency	25.05	45.54	25.05	45.54
2. relationships and learning	6.44	11.71	31.49	57.25
3. communication	2.63	4.79	34.13	62.05
4. work-life balance in the context of time commitment	1.74	3.17	35.87	65.23
5. motivation	1.51	2.74	37.38	67.97
6. stress factors, distractions	1.31	2.37	38.68	70.34
7. work-life balance in the context of work burden	1.04	1.88	39.72	72.23

Source: Own research.

Step 4 – interpretation of results. It can be concluded on the basis of the principal component analysis that the opinions expressed on online work by Generation Z employees in the survey can be reduced to seven dimensions, of which the two initial ones being "knowledge, information and efficiency" and "relationships and learning" refer to the area of knowledge exchange in the context of work performance and its social environment. The first of these factors explains as much as 45.54% of all the variance, whereas the second one explains 11.71%. Structuring of the factors as test points on a scale involved the contributions of the variable based on correlation as well as common variable resources based on correlation.

6. Discussion

The completed survey covered such aspects of online work as: employee relations, knowledge transfer/information/learning, motivation, work organization, work-life balance and employee well-being. Application of the PCA method has demonstrated that the matters related to knowledge, information and learning categories have turned out to be essential in terms of building opinions and attitudes towards online work. However, these were structured differently than the assumptions for the survey. It should be noted that these categories are perceived by Generation Z employees, particularly those with a preference toward online work (Astorquiza-Bustos, Quintero-Peña, 2023; Bamieh, Ziegler, 2022), mainly with regard to work performance, although it should not be disregarded that the respondents associate the knowledge exchange/learning processes with building social relationships at the workplace. It should be further emphasized that the respondents were critical about the impact of online work on the opportunity to learn from pears, to better clarify new knowledge to other employees or to learn from more experienced employees. Hence, these aspects are important for young workers but not realized to a satisfactory degree in online work. These processes are particularly important in social and professional adaptation, which is a key phase for a young worker in their advancement toward maximum performance on the job (Yarbrough, Ramos Salazar, 2023). They are also important as components of career development and building their position in the organization. As noted by Bloom et al. (2015), online work may lead to limitations in terms of accessibility of broadly defined knowledge as well as promotion and career development opportunities. Moreover, matters of employee relationships should be associated with the preferences Generation Z have about feedback in the learning process and job performance (Hegade, Shettar, 2022; Steyn et al., 2020). It seems that organizations should pay special attention to managing those aspects of online work environment which can make today's learner become a mentor to another employee tomorrow, thus fostering uninterrupted transfer of the organization's knowledge. In addition to the generational reference, aspects of personnel functioning in online jobs should be analyzed in the context of the COVID-19 pandemic as well. The research findings on that period pointed to the aspects work-life balance and well-being being essential for those employees who switched to online work on a mass scale during the pandemic (Augstein et al., 2023; Chou et al., 2023). Numerous employees had to manage household chores, caring activities and learning at home simultaneously (Vaziri et al., 2020) while worrying about well-being and health issues (Fogarty et al., 2022). It had a great impact on satisfaction with remote work (Carillo et al., 2021) and work performance (Burk et al., 2021). In the course of preparation of the survey, it was intentionally assumed that the respondents should have the experience of working online in 2022 when almost the whole world has returned to normal functioning in terms of work. However, the change that occurred in the "new normal" was mainly that employees began to intentionally choose online work as their preferred system (Šmite et al., 2023). Interestingly, work-life balance aspects were of less importance for the respondents in their evaluation of online work (components 4 and 7).

7. Conclusions

The matters related to knowledge, information and learning categories have turned out to be essential in terms of building opinions and attitudes towards online work. It should be noted that these categories are perceived by Generation Z employees mainly with regard to work performance, although it should not be disregarded that the respondents associate the knowledge exchange processes with building social relationships at the workplace. This aspect is particularly important with respect to Generation Z for which major competence gaps are being identified in terms of social competence. What it communicates to the organization is that although Generation Z members are aware of the significance of the knowledge transfer and learning processes and they understand the role of peer relations in these processes, they are unable to overcome the social barriers created by the online working system due to lack of appropriate skills. In order to dwell upon the underlying causes of this situation, it should be recommended to proceed with further in-depth qualitative research.

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