Paradigm Academic Press
Art and Society
ISSN 2709-9830
OCT. 2022 VOL.1 NO.2

Generation Z's Opinion About Sustainability of Office Buildings

Maximilian Wolf[1] & Anja Kluge[2]

[1] Corporate Management and Human Resources, University of Applied Sciences Albstadt-Sigmaringen, Sigmaringen, Germany

[2] Kluges Konzept, Munich, Germany

Correspondence: Maximilian Wolf, Corporate Management and Human Resources, University of Applied Sciences Albstadt-Sigmaringen, Sigmaringen, Germany.

doi: 10.56397/AS.2022.10.04

Abstract

Currently, there are hardly any studies that evaluate the topic of sustainable construction of office buildings from the viewpoint of Generation Z (born between 1995 and 2010) as future users. This article answers the question of how important sustainability is to Generation Z with respect to office buildings. To answer the question, the research uses primary data obtained among 58 Generation Z representatives in Germany in 2022. Survey participants were asked to evaluate an adapted model used by the *Deutsche Gesellschaft für Nachhaltiges Bauen* (German Sustainable Building Council) to certify companies with regard to the sustainability of their office buildings. In summary, our study indicates that German Generation Z respondents want to move safely in energy-efficient office buildings that have sufficient daylight, high indoor air quality, and offer comfortable temperature in all seasons. The needs for autonomy, relatedness and competence correlate significantly with these characteristics, which are particularly important to them. Meaning that these could also be satisfied by an optimal design of the office building.

Keywords: Generation Z, sustainability, office building

1. Introduction

The COVID-19 pandemic has significantly transformed the work and office world in Germany. Digitalization, which had already begun before the pandemic, was massively driven forward by the 2020 lock-downs and the associated home office obligation. Numerous companies gained experience with decentralized working for the first time. Home office work will continue to be a part of our working world. And above all, it is to be expected that professional communication will take place in virtual space in the long term. Consequently, the planning, construction and operation of office buildings as well as office space requirements can be critically scrutinized. According to a survey by the *Fraunhofer IAO* (Fraunhofer Institute for Industrial Engineering IAO), 40% of respondents[1] assume that less office space will be needed in the future because employees will increasingly work from home (Dienes & et al., 2022).

However, the short report published by the *Institut der Deutschen Wirtschaft* (Institute of the German Economy) in February 2021 cannot confirm this trend. Even if the number of days spent in the home office increases, only 6.4 percent of companies want to reduce office space. In many companies, the office will therefore remain the central point for knowledge transfer and interpersonal exchange in the future. This raises the question of how office space should be designed to meet the changing needs of current and future employees. Office buildings generally need to offer a tangible added value compared to the home office in order to increase the performance and job satisfaction of employees at both locations (Bockstahler & et. Al., 2020), and to make it worthwhile for employees to travel to the office.

Companies that put their office space to the test are often confronted with several important questions:

How should office space be optimally designed to provide value to employees and best support workflows?

How can the office space be operated economically? Where can resources be saved in the process?

How can a sustainable office building contribute to climate protection?

How can office space attract talent? Which aspects are attractive to Generation Z, the future applicants?

While the first question can only be answered individually, the topics of sustainability and attractiveness seem particularly relevant to Generation Z in our opinion.

Sustainability in general is more than a trend these days, as evidenced by the Fridays for Future movement, climate protection, or sustainable travel, for example (Dienes & et al., 2022). Sustainability and environmental awareness are advancing to become a central economic factor in entrepreneurial activity under the buzzword "neo-ecology" (https://www.zukunftsinstitut.de/dossier/megatrend-neo-oekologie/. Accessed 08/12/2022). Due to the war in Ukraine and the associated challenges in food and energy supply in 2022, the issue of sustainability has become even more prominent (https://www.umweltbundesamt.de/themen/nachhaltigkeit-strategien-internationales/folgen-der-ukraine-krise-fuer-die-nachhaltigkeits. Accessed 08/12/2022).

Sustainability can be an important factor in the context of office buildings to offer added value compared to home offices. In Germany, the issue of sustainability in office buildings is being driven by various organizations, such as the *Deutsche Gesellschaft für Nachhaltiges Bauen* (German Sustainable Building Council), which is Europe's largest sustainable building network. This non-profit organization researches, publishes and trains interested parties from the construction and real estate industries to create an appropriate "understanding of quality as the basis for responsible, sustainable action." It also certifies office buildings to its sustainable building standards (https://www.dgnb.de/de/verein/. Accessed 07/26/2022).

Especially among young people from Generation Z, environmental and climate protection are top issues (Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz 2020). Against the backdrop of demographic change, and considering that the shortages on the German labour market will continue to worsen (https://www.bibb.de/de/33212.php. Accessed 08/15/2022), it seems crucial for companies to win over Generation Z as future specialists in the areas of environmental and climate protection, among others. Consequently, it makes sense for companies to invest in sustainable office space for two reasons. First, they could contribute to climate protection. Second, they could increase their attractiveness to Generation Z talents.

Currently, there are hardly any studies that allow Generation Z as future users to evaluate the topic of sustainable construction of office buildings in Germany. This article therefore raises the question of how Germany's Generation Z assesses the issue of sustainable office buildings. To answer the question, the study uses primary data obtained in 2022 among 58 German Generation Z representatives. The survey participants were asked to evaluate an adapted model used by the *Deutsche Gesellschaft für Nachhaltiges Bauen* to certify companies with regard to the sustainability of their office buildings. The model focuses on people in the context of the built environment and considers the associated factors influencing health and well-being. Chapter 2 provides the background of the study by characterizing Generation Z and its understanding of sustainability. Furthermore, it outlines the model of *Deutsche Gesellschaft für Nachhaltiges Bauen* and its elements which forms the basis for the online survey. Chapter 3 describes the research approach. Chapter 4 answers the research question by presenting the generated results from the conducted survey. Chapter 5 presents implications for the construction of sustainable office buildings from the perspective of Generation Z, before drawing a conclusion and highlighting the limitations of the study.

2. Background

Generation Z (born between 1995 and 2010)[2] is often referred to as Generation YouTube with regard to the generation concept. Generation Z was born into a world with the Internet and grew up with the social media hype (e.g., Instagram, TikTok). This can explain their high affinity for technology (Käufer & Pawlik, 2020). According to a study by the *Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit* (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) (2018), an intact natural environment is part of a good lifestyle for 86% of German adolescents and young adults, and 86% of the 1,034 respondents attribute responsibility for environmental protection primarily to the state. Central demands of the 14 to 25-year-olds on German politics are to protect the forests, marine protection and the formation of sustainable resources (https://simon-schnetzer.com/blog/die-generation-z-und-nachhaltigkeit-fakten-und-hintergruende/#1. Accessed 07/28/2022). However, 68% of young people also see business as having a duty to protect the environment (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit, 2018).

Sustainability and climate protection are also key issues for Generation Z when it comes to housing. In survey by

Forsa, 64% of the young people questioned said they think it is right for tenants and landlords to pay higher housing costs, for example due to CO2 levies or surcharges resulting from energy-related renovations (Twenhoefel 2021. https://business.ewe.de/magazin/wohnungswirtschaft/quartier-fuer-generation-z?suku=1. Accessed 28.07.2022).

The *Deutsche Gesellschaft für Nachhaltiges Bauen* has set itself the goal of "planning, operating and using the built environment for the benefit of all in such a way that the interests of future and future generations do not suffer-as far as possible without any restrictions on the present generation" (Deutsche Gesellschaft für Nachhaltiges Bauen, 2019).

To this end, the *Deutsche Gesellschaft für Nachhaltiges Bauen* focuses on people in order to investigate which influencing factors in the context of buildings are relevant for the health and well-being of us humans. These are shown in the following figure 1:

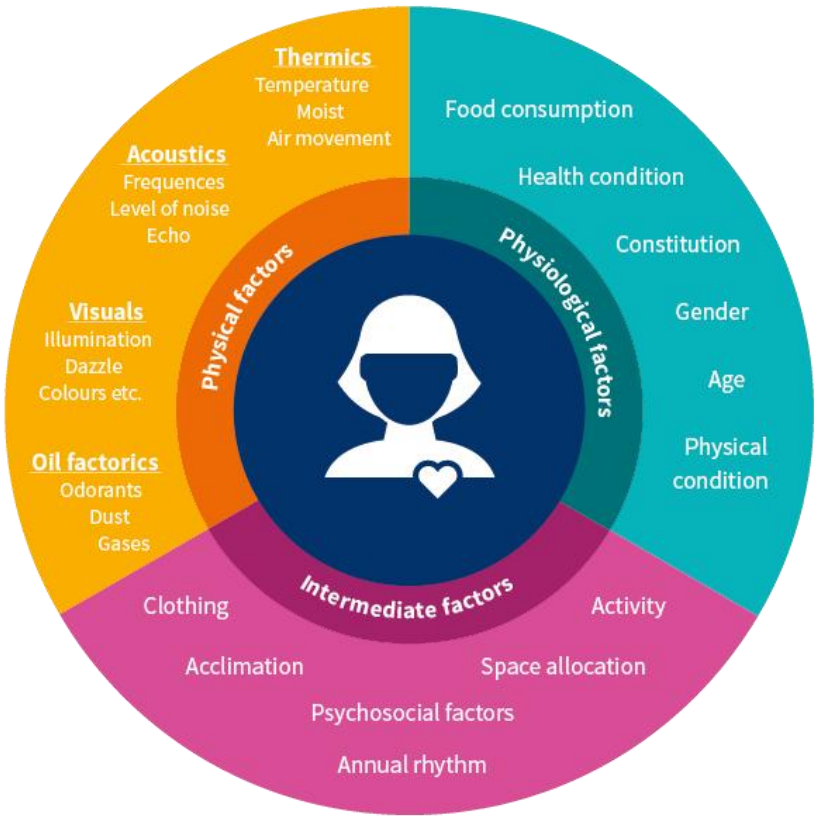


Figure 1. People in the context of the built environment

(Own figure based on Deutsche Gesellschaft für Nachhaltiges Bauen (2019))

On the basis of this fundamental model, there are therefore many starting points, particularly in the area of physical influencing factors, which should be considered in the planning and design of buildings in order to positively influence the health and well-being of the people in them.

In order to provide concrete assistance to planners and decision-makers, the *Deutsche Gesellschaft für Nachhaltiges Bauen* developed a certification system based on this basic assumption of the influence of buildings on human health. This is based on the following pillars (see figure 2):

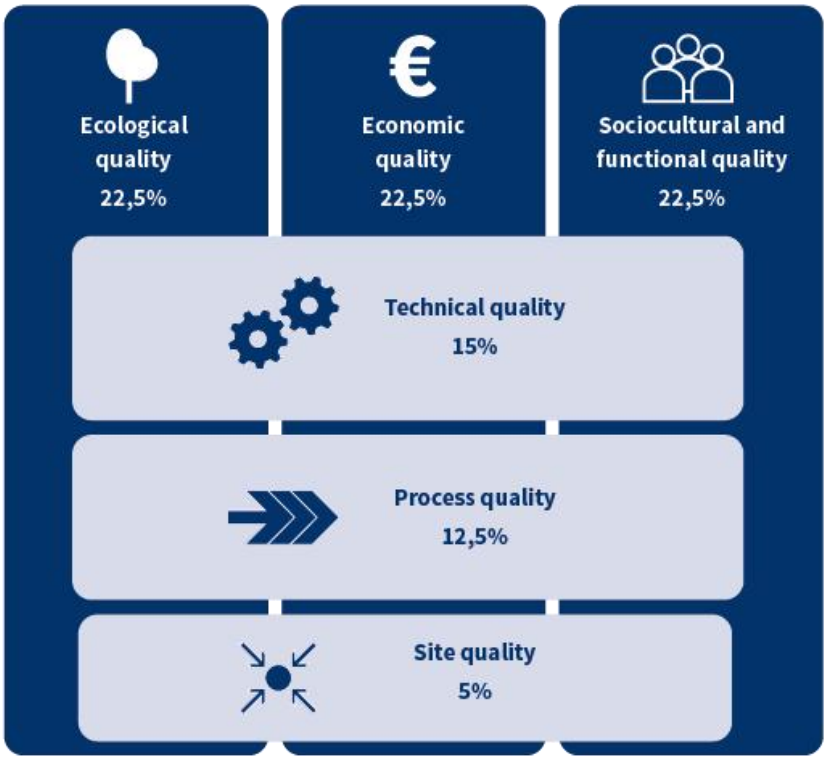


Figure 2. Basic structure of the Deutsche Gesellschaft für Nachhaltiges Bauen certification system
(Own figure based on the Deutsche Gesellschaft für Nachhaltiges Bauen (2018))

Precise criteria have been developed for each of these pillars. The extent to which these criteria are met is assessed by experts and points are awarded.

Ecological quality includes aspects of "impact on the global and local environment" and "resource consumption and waste generation". Economic quality includes "life cycle costs" and "value development". The socio-cultural and functional quality is assessed on the basis of "health, comfort and user satisfaction" and "functionality". The "quality of technical execution", the "location quality" and the "process quality" ("quality of planning and construction") also play a role. The criteria are weighted differently (Deutsche Gesellschaft für Nachhaltiges Bauen, 2018).

For existing buildings, only the main factors of ecological quality, economic quality, and sociocultural and functional quality are considered (Deutsche Gesellschaft für Nachhaltiges Bauen, 2022. https://www.dgnb-system.de/de/gebaeude/im-betrieb/kriterien/. Accessed 08/12/2022).

3. Approach

A computer-mediated online survey is suitable for answering the research question. With this it is possible to reach spatially dispersed persons. In order to draw a probabilistic sample, the link is not made available to the entire public on the Internet, but rather only to selected representatives of Generation Z. Various studies have shown that online surveys are not particularly prone to misrepresentation. In addition, online surveys are extremely cost-effective to conduct (Bortz & Döring, 2006). The use of an online questionnaire also makes sense because this medium is familiar to Generation Z, as described in Chapter 2.[3]

Since there are no comparable questionnaires available for the research question, it is necessary to create a separate questionnaire (Bortz & Döring, 2006).

The *Deutsche Gesellschaft für Nachhaltiges Bauen* has developed a checklist to match its model described in chapter 2. This checklist is entitled "How to put people at the center of planning" (Braune & et al., 2019). Compared to the highly differentiated certification catalogues, the checklist is written in a simple and comprehensible way. Thus, even people who have no experience with the topic of sustainable construction of office buildings can understand the questions and answer them.

After the start page of the survey with instructions on how to fill out the questionnaire[4], all questions of the

above checklist of the *Deutsche Gesellschaft für Nachhaltiges Bauen* were asked. However, the questions were clustered into the categories "building design", "physical influencing factors" and "mobility" and rephrased in terms of language. This was intended to make it easier to complete the questionnaire. The survey participants were asked to assess how important sustainability is to them in the office buildings of their (future) employers with regard to the individual items. A Likert scale with seven values was chosen to determine the importance. The Likert scale with seven expressions for the query of the importance is recommended (Brunner II, 2016).

In a further block of questions, the survey participants were asked to rate how important it is to them to satisfy the needs of "freedom and choice," "social relationships and belonging," and "influence and control over one's own actions. According to current psychological research, these three needs are considered to be the most important basic needs. Within the framework of the much-researched Social Determination Theory, Deci and Ryan developed the "Basic Psychological Needs" with just these central needs (autonomy, relatedness, competence) (Ryan & Deci, 2000). It has been shown that not only autonomy, relatedness, and competence are correlated with well-being, but that daily satisfaction of the three needs predicts daily well-being (Reis & et al., 2000, Sheldon & et al., 1996). A cross-cultural study (in Belgium, China, the U.S., and Peru) found that need satisfaction leads to well-being, whereas need frustration predicts unhappiness, without individual differences having a moderating influence (Chen & et al., 2014).

In the last block of questions, sociodemographic data on age and gender (male, female, diverse) were requested. In addition, the survey participants were asked to state their current status (vocational training, university studies, in a permanent position or self-employed).

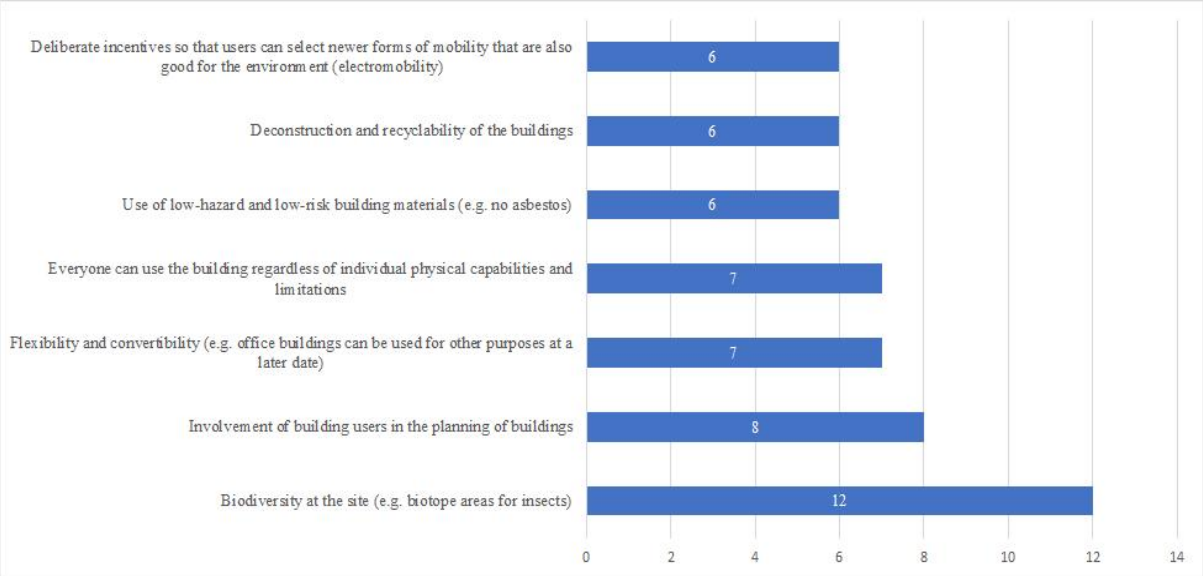
4. Findings

The survey was conducted with the help of survey software from www.survio.com in the period from July 22, 2022 to August 7, 2022 among representatives of Generation Z at the University of Applied Sciences Albstadt-Sigmaringen (Germany) and at the Freising State Business School (Germany). Since "incentives" are suitable for increasing the response rate (Bortz and Döring, 2016), a prize draw with three Amazon vouchers worth 15 Euros each was offered.

A total of 61 people took part in the survey. Two data sets had to be deleted because the persons did not belong to the defined definition of Generation Z due to their age. One data set was deleted because it was not complete. Thus, 58 data sets were usable for the analysis. 27 persons felt they belonged to the male gender, 29 to the female gender, and two to the miscellaneous gender. The average age of the respondents was 16.5 years. 24 respondents were in vocational training, 16 were studying at university at the time of the survey, and nine each were in permanent employment or self-employed.

If the assessment of Generation Z is evaluated descriptively with regard to the sustainability of office buildings, Table 1 shows which aspects were most frequently described as "very unimportant" or "unimportant" by the 58 respondents.

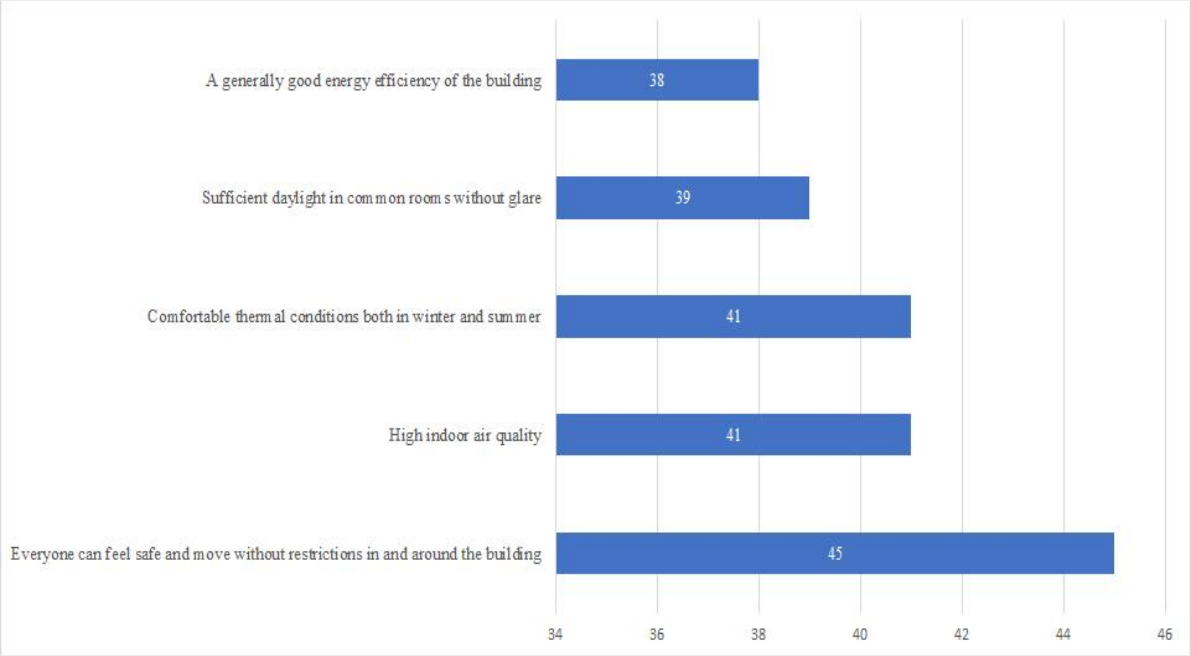
Table 1. Aspects of office building sustainability most frequently cited as "very unimportant" or "unimportant"



It can be seen that biodiversity at the location does not play a role for most people. One explanation for this could be that Generation Z in Germany tends to locate biotope areas in the open countryside. Furthermore, it does not seem to be of great importance to the respondents that the building users are involved in the planning of the buildings. This assessment could be explained by the fact that Generation Z in Germany wants a clear distribution of tasks and would like to place planning in the competent hands of building planners.

Table 2 shows a descriptive analysis of the 58 responses from the perspective of which aspects of office building sustainability were most “important” or “very important” to respondents.

Table 2. Aspects of the sustainability of office buildings most frequently named as “Important” or “Very important”



In summary, it could be said with regard to sustainability that the respondents would particularly like to move around safely in well-tempered, bright, well-ventilated and energy-efficient office buildings at all times of the year.

It can be shown that the elements of sustainability of office buildings that are important in the assessment correlate positively with Generation Z’s needs for autonomy, relatedness and competence. The evidence was based on ordinal scaling using Pearson’s test (see Table 3).

Table 3. Correlations of Generation Z needs with key aspects of office building sustainability

Correlations

		Need for autonomy (freedom and choice)	Need for connectedness (social relationships and belonging)	Need for competence (influence and control over one's own actions)	Everyone can feel safe and move without restrictions in and around the building	High indoor air quality	Comfortable thermal conditions both in winter and summer	Sufficient daylight in common rooms without glare	A generally good energy efficiency of the building
Need for autonomy (freedom and choice)	Pearson Correlation	1	,247	,515**	,351**	,483**	,479**	,427**	,283*
	Sig. (2-tailed)		,061	,000	,007	,000	,000	,001	,031
	N	58	58	58	58	58	58	58	58
Need for connectedness (social relationships and belonging)	Pearson Correlation	,247	1	,653**	,387**	,191	,225	,200	,205
	Sig. (2-tailed)	,061		,000	,003	,151	,089	,132	,123
	N	58	58	58	58	58	58	58	58
Need for competence (influence and control over one's own actions)	Pearson Correlation	,515**	,653**	1	,549**	,563**	,608**	,334*	,274*
	Sig. (2-tailed)	,000	,000		,000	,000	,000	,010	,037
	N	58	58	58	58	58	58	58	58
Everyone can feel safe and move without restrictions in and around the building	Pearson Correlation	,351**	,387**	,549**	1	,441**	,658**	,288*	,185
	Sig. (2-tailed)	,007	,003	,000		,001	,000	,029	,164
	N	58	58	58	58	58	58	58	58
High indoor air quality	Pearson Correlation	,483**	,191	,563**	,441**	1	,681**	,504**	,501**
	Sig. (2-tailed)	,000	,151	,000	,001		,000	,000	,000
	N	58	58	58	58	58	58	58	58
Comfortable thermal conditions both in winter and summer	Pearson Correlation	,479**	,225	,608**	,658**	,681**	1	,407**	,410**
	Sig. (2-tailed)	,000	,089	,000	,000	,000		,002	,001
	N	58	58	58	58	58	58	58	58
Sufficient daylight in common rooms without glare	Pearson Correlation	,427**	,200	,334*	,288*	,504**	,407**	1	,327*
	Sig. (2-tailed)	,001	,132	,010	,029	,000	,002		,012
	N	58	58	58	58	58	58	58	58
A generally good energy efficiency of the building	Pearson Correlation	,283*	,205	,274*	,185	,501**	,410**	,327*	1
	Sig. (2-tailed)	,031	,123	,037	,164	,000	,001	,012	
	N	58	58	58	58	58	58	58	58

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The aspect that “everyone can feel safe and move around the building without restrictions” correlates positively with the needs for “autonomy”, “relatedness” and “competence”. All correlations are significant at the one percent level. Considering the values “freedom” that are central to Generation Z (https://simon-schnetzer.com/generation-z/#haupteigenschaften-genz. Accessed 08/08/2022), these correlations seem plausible. Generation Z in Germany wants to be able to move around in a self-determined way.

All other aspects both correlate positively with the needs for “autonomy” and “competence”. All correlations are significant at least at the five percent level. Against the backdrop of the values “health” and “freedom” that are central to Generation Z (https://simon-schnetzer.com/generation-z/#haupteigenschaften-genz. Accessed 08/08/2022), these correlations also seem plausible. Generation Z in Germany wants to work in healthy rooms that they can adjust to their personal temperature sensation at any time.

These correlations show us that basic needs originally to be satisfied by the social context can also be addressed by the physical context. Based on the fact that we all want to satisfy these basic needs in individually different ways, it stands to reason that also to consider in the design of office buildings how the space can contribute to the satisfaction of these needs. The correlations of indoor air quality, temperature, daylight and energy efficiency with the needs of autonomy and competence give us clues for practical implementation. It seems understandable that Generation Z feels more autonomous, freer in their decisions and more competent, more effective in their actions when their physical sensations are pleasant. As a result, these fade into the background and do not draw attention away from the actual tasks in the office.

5. Conclusions

In addition to the more immediate benefits of sustainable action, the employer branding aspect could also motivate companies to invest more in the sustainability of their office buildings in the current situation of a shortage of skilled workers. The following recommendations for action result from this study:

5.1 Note Values

As the correlation analyses have shown, it appears to be important for companies to pay attention to Generation Z’s values. To this end, it can be helpful for companies to question their own prevailing values. This can be done, for example, by surveying employees and asking them about the values that employees perceive in the company. In addition, employees can be asked to share those values that are important to them. Another measure can be the public communication of the values that are important to the company, so that Generation Z can find out whether they fit the company in the sense of Edwards and Coopers’ (1993) “Person-Environment Fit”. In addition, it can

be helpful to make the values tangible, for example in case studies or in an open day. Finally, companies can involve Generation Z in the process of defining values, communicating them and making them tangible (Schnetzer 2021).

5.2 Include Basic Human Needs in the Planning Process

In addition to our values, our needs also influence our thoughts, feelings and actions. In general, our results indicate that the three basic needs according to Deci and Ryan, namely autonomy, relatedness and competence, can also be satisfied by the physical context, for example the office building. Therefore, it is worthwhile to invest in a concept in the context of design that makes the satisfaction of these needs more likely. The correlation table shown above can indicate initial starting points.

When designing, they can ask themselves the following questions:

Autonomy: How can I incorporate more choice into the design of my office?

Relatedness: How can I make social interaction more likely through the architecture and increase connectedness/identification with the company?

Competence: How can I give employees good direction and all the necessary work tools so they can be self-efficient.

5.3 Enable Safe and Free Movement in and Around Office Buildings

The aspect of safe and free movement in and around office buildings should be considered not only for Generation Z. A first measure could be to offer training on safety rules and regulations in the workplace. According to a recent study by *DEKRA*, only 58 percent of employees surveyed from Germany say they regularly receive training or information on workplace safety. In addition, emergency drills should be carried out regularly in companies, for example in the event of a fire alarm. The *DEKRA* study shows that only just under half of the companies hold such drills regularly, in the sense of at least once a year. Psychological risk assessments, also in connection with home offices, often appear to make sense (*DEKRA,* 2021).

In addition, the architecture of the building can also convey a sense of security. A solid building structure or regular renovation can have a positive influence on the perception of safety, as can, for example, the illumination of darker corridors or seating areas with a protective wall behind them.

5.4 Ensure Healthy and Temperable Indoor Climate

In Germany, there are many regulations governing room temperature, noise or light, such as the *Arbeitsschutzgesetz* (Occupational Health and Safety Act), *Arbeitsstättenverordnung* (Workplace Ordinance), the Bildschirmarbeitsverordnung (Display Screen Equipment Ordinance) or the norm *DIN 5035-7: Lighting of Display Screen Workplaces* by the *Deutsches Institut für Normung e. V.* (German Institute for Standardization). Compliance with these places the physical health of those working there in the foreground. In addition, the psychological well-being can also be influenced. If, for example, the temperature can be regulated or windows can be opened, this satisfies the aforementioned need for autonomy as well as for control. In terms of sustainability, suitable ventilation and resource-saving cooling and heating should be considered at an early stage in the planning of buildings in order to be able to avoid air conditioning systems, for example.

5.5 Ensure Sufficient Daylight

Numerous studies clearly show time and again the influence that light has on our health and well-being. Circadian rhythms, i.e. our day-night rhythm, are controlled by light by releasing corresponding hormones. Negative consequences of too little daylight, such as vitamin D deficiency or an increased risk of depressive episodes, are also known.

In addition to the health aspects, good lighting improves the ability to concentrate and perform (cf. e.g. Fisch and Khanh, 2000). Therefore, the above-mentioned regulations also regulate the light intensities at the workplace. However, studies have shown that the preferred brightness of users is far above the legally prescribed illuminance (Moosmann, 2015). If you cannot ensure sufficient daylight in some areas, daylight lamps would be a conceivable alternative. High-quality daylight lamps usually offer significantly higher luminous intensity and match the color spectrum to that of natural light over the course of the day. Light color is another critical influencing factor. The blue components of the screen light should be increasingly filtered out in the second half of the day, since the blue component of daylight also decreases over the course of the day.

Therefore, make sure you have sufficient and good lighting, preferably daylight. When constructing buildings, you can influence the window area. Users prefer medium window areas of about 60% of the facade (Moosmann, 2015).

5.6 Building Office Buildings Energy Efficient

As can be seen from our study, energy-efficient office buildings are an important factor for future Generation Z employees in terms of employer attractiveness. Moreover, the satisfaction of current employees can also be increased.

In addition, by increasing their energy efficiency, companies can also strengthen their ties with their customers, as these too are in many cases becoming increasingly energy-and environmentally-conscious. Furthermore, energy-efficient buildings can reduce energy costs and increase independence from price fluctuations for fossil fuels, for example. In order to make office buildings sustainable and fit for the future in terms of energy efficiency, energy consulting can be a useful first step (Bundesministerium für Wirtschaft und Energie, 2021). These consultations and investments in energy efficiency measures are often subsidized by the state. [5] And last but not least, companies can thereby live up to their social responsibility and act in a resource-saving manner for the benefit of all.

By investing in sustainable office buildings, companies can not only contribute to climate protection, but also increase their attractiveness among Generation Z talent. Our study indicates that the German Generation Z representatives surveyed would like to move safely in energy-efficient office buildings that have sufficient daylight, high indoor air quality and a pleasant temperature in all seasons. The needs for autonomy, relatedness and competence correlate significantly with these characteristics, which are particularly important to them. This means that these could also be satisfied by an optimal design of the office building.

One limitation of our study is the comparatively small number of respondents. One explanation for the low response rate could be the survey period. This is within the summer vacation period at schools and during the lecture-free period at German colleges and universities. It is conceivable that students do not check their e-mails frequently enough during this time. Therefore, it seems necessary to repeat the survey with a significantly higher number of participants. It would also be interesting to find out how the survey would turn out in other cultures.

References

Bortz J, Döring N, (2006). Forschungsmethoden und Evaluation für Human-und Sozialwissenschaftler, 4th edition, Springer, Wiesbaden (Germany).

Braune A, Jansen F, Klaunig P, Durán C R, Lemaitre C, (2019). Report 2019. Lebenswert & Zukunftsfähig. Der Mensch im Mittelpunkt des nachhaltigen Bauens. http://download.sks-infoservice.de/assets/downloads/DGNB_Report_Mensch_im_Mittelpunkt_DE.pdf. Accessed 07/29/2022.

Bruner II G C, (2016). Marketing Scales Handbook: Multi-Iteam Measures for Consumer Insight Research. 2. Auflage, CreateSpace Independent Publishing Platform, Fort Worth, Texas (USA).

Bockstahler M, Jurecic M, Rief S, (2020). Homeoffice Experience. Eine empirische Untersuchung aus Nutzersicht während der Corona-Pandemie. https://www.iao.fraunhofer.de/content/dam/iao/images/dokumente/2020_Homeoffice_Experience.pdf. Accessed 07/22/2022.

Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz (2020) Umweltbewusstsein in Deutschland 2020. https://www.bmuv.de/fileadmin/Daten_BMU/Pools/Broschueren/umweltbewusstsein_2020_bf.pdf. Accessed 07/26/2022.

Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit, (2018). Zukunft? Jugend fragen!. https://www.bmuv.de/fileadmin/Daten_BMU/Pools/Broschueren/jugendstudie_bf.pdf. Accessed 07/28/2022.

Bundesministerium für Wirtschaft und Energie, (2021). Energieeffizienz in Unternehmen. https://www.bmwk.de/Redaktion/DE/Publikationen/Energie/energieeffizienz-in-unternehmen.pdf?__blob=publicationFile&v=42. Accessed 08/15/2022.

Chen B, Assche J V, Vansteenkiste M, Soenens B, Beyers W, (2014). Does psychological need satisfaction matter when environmental or financial safety are at risk? Journal of Happiness Studies. DOI 10.1007/s10902-014-9532-5.

Deci E L, Ryan R M, (2000). The what and why of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), pp. 227-268.

DEKRA, (2021). Arbeitssicherheitsreport 2021. https://www.dekra.de/media/dekra-arbeitssicherheitsreport-2021.pdf. Accessed 08/15/2022.

Deutsche Gesellschaft für Nachhaltiges Bauen, (2018). DGNB System Kriterienkatalog Neubau Version 2018. https://www.dgnb.de/de/verein/publikationen/bestellung/downloads/DGNB_Kriterienkatalog_Neubau_EV_

2018.pdf. Accessed 08/12/2022.

Dienes K, Ruess P, Rief S, (2022). Back to the office. https://www.iao.fraunhofer.de/content/dam/iao/images/iao-news/back-to-the-office.pdf. Accessed 07/22/2022.

Edwards J R, Cooper C L, (1993). The Person-Environment Fit Approach to Stress: Recurring Problems and Some Suggested Solutions. *Journal of Organizational Behaviour, 11*(4), pp. 293-307.

Fisch J, Khanh T Q, (2000). Licht und Gesundheit. Das Leben mit optischer Strahlung. https://www.tu-ilmenau.de/fileadmin/Bereiche/MB/lichttechnik/Literatur/2001/Fisch_Khanh.pdf. Accessed 08/25/2022.

Käufer T, Pawlik V, (2020). Generation Z, Millenials und Generation X-ein Überblick. Dossierplus zu den Lebenswelten der Generationen X, Y und Z, Statista (Germany).

Klerk E, Longworth B S, Kharbanda A, Jiang B, Ziffer M, (2022). The young consumer and a path to sustainability. https://www.credit-suisse.com/media/assets/corporate/docs/about-us/research/publications/csri-the-young-consumer-and-a-path-to-sustainability.pdf. Accessed 07/28/2022.

Moosmann C, (2015). Visueller Komfort und Tageslicht am Bueroarbeitsplatz: Eine Felduntersuchung in neun Gebaeuden. https://www.ksp.kit.edu/site/books/10.5445/KSP/1000044751/download/7545/. Accessed 08/25/2022.

Reis H T, Sheldon K M, Gable S L, Roscoe J, Ryan R M, (2000). Daily well-being: The role of autonomy, competence, and relatedness. http://doi.org/10.1177/0146167200266002.

Ryan R M, Deci E L, (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), pp. 68–78.

Schaefer D R, Dillmann D A, (1998). Development of a Standard E-Mail Methodology. *Public Opinion Quartely, 62*, pp. 378-397.

Schnetzer S, (2021). Die Studie Junge Deutsche 2021-Zukunft neu denken und gestalten: Lebens-und Arbeitswelten der Generation Z & Y, Datajockey.

Scholz C, (2014). Generation Z-Wie sie tickt, was sie verändert und warum sie uns alle ansteckt. WILEY-VCH Verlag, Weinheim (Germany).

Sheldon K M, Ryan R M, Reis H T, (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin*, (22), pp. 1270—1279.

Statista (2022) Fachkräftemangel in Deutschland. Hamburg (Germany).

Stettes O, Voigtländer M, (2021). IW-Kurzbericht 6/2021. Büroflächenabbau bleibt Ausnahme. https://www.iwkoeln.de/fileadmin/user_upload/Studien/Kurzberichte/PDF/2021/IW-Kurzbericht_2021-Bueroflaechenabbau.pdf. Accessed 07/22/2022.

---

[1] In this article, the masculine form is used for ease of reading. However, the comments apply equally to all genders: male, female and diverse.

[2] Different authors specify different birth cohorts. The transition appears to be fluid (https://simon-schnetzer.com/generation-z/ Accessed 12.07.2022). For a further discussion of the transition of birth cohorts, see e.g. Scholz (2014).

[3] Further information on the theory and practice of online surveys can be found, for example, in Schaefer and Dillmann (1998).

[4] Th questionnaire will be gladly provided in German or English upon request.

[5] An initial overview of the federal funding programs in Germany is provided by https://www.bafa.de/DE/Energie/Effiziente_Gebaeude/Sanierung_Nichtwohngebaeude/sanierung_nichtwohngebaeude_node.html;jsessionid=E17F6DC062C450DA4AFAD484344B3C63.1_cid362. Accessed 08/15/2022.