Volume 13 Empirická studie Number 1, 2023

MOTIVATION FOR ONLINE EDUCATION OF MEMBERS OF GEN Z BASED ON THEIR GENDER

Iveta Černíková[1], Ivana Šnýdrová[1]

[1]Vysoká škola ekonomie a managementu a.s., Nárožní 2600/9 A, 158 00 Praha 5, Česká republika

Podáno: 27. 8. 2022, Přijato: 2. 1. 2023
Link to this article: https://doi.org/10.11118/lifele20231301007

To cite this article: ČERNÍKOVÁ IVETA, ŠNÝDROVÁ IVANA. 2023. Motivation for Online Education of Members of Gen Z Based on their Gender. *Lifelong Learning - celoživotní vzdělávání*, 13 (1): 7–29.

Abstract

Generation Z includes the largest group of pupils and students affected by the crisis of educational interactions caused by the measures against the Covid-19 spread. In addition, researchers consider the cohort to be the most affected globally by events such as the economic, climate and security crisis, the reorganization of traditions or the digitization. Thanks to these factors, these individuals move to the virtual world, where they focus primarily on their own interests. However, these factors also support flexibility and responsibility. Thus, the conditions for online education should be ideal for this generation, thanks to which the motivation for education could be increased.

The research is based on 336 questionnaire surveys conducted in 2020 and 2021, the participants of which were primary school pupils, secondary school students and university students from Prague and the Central Bohemian, South Bohemian and Ústí nad Labem Regions

who belong to the Z generation according to their date of birth. The aim of the article is to evaluate the motivation and incentives for the education of Generation Z representatives with an emphasis on their gender using the following criteria: a crisis situation, parents, teachers, importance of education, further education and online education preferences. In the case of both groups, the year-on-year approach to these criteria has undergone significant changes towards the differences widening. Moreover, the high correlation of all the factors examined in relation to gender confirmed its important role in the motivation for education.

Keywords: generation Z, gender, motivation, online education

MOTIVACE PRO ONLINE VZDĚLÁVÁNÍ GENERACE Z NA ZÁKLADĚ JEJICH POHLAVÍ

Abstrakt

Generace Z zahrnuje největší skupinu žáků a studentů postižených krizí vzdělávací interakce způsobenou opatřeními proti šíření covidu-19. Vědci navíc tuto kohortu považují za globálně nejvíce zasaženou událostmi, jako je ekonomická, klimatická a bezpečnostní krize, reorganizace tradic nebo digitalizace. Díky těmto faktorům se tito jedinci přesouvají do virtuálního světa, kde se soustředí především na své vlastní zájmy. Tyto faktory však zároveň podporují flexibilitu a zodpovědnost. Pro tuto generaci by tak měly být podmínky online vzdělávání ideální, díky čemuž by mohla být zvýšena motivace ke vzdělávání.
Výzkum je založen na dvou dotazníkových šetřeních (n = 336), kterých se v letech 2020 a 2021 účastnili žáci základních škol, studenti středních a vysokých škol z Prahy, Středočeského, Jihočeského a Ústeckého kraje, patřících podle data narození do generace Z. Cílem článku je zhodnotit motivaci a stimulaci představitelů generace Z ke vzdělávání s důrazem na jejich genderovou příslušnost na základě následujících kritérií: krizová situace, rodiče, učitelé, význam vzdělávání, další vzdělávání a preference online vzdělávání. V případě obou skupin doznal

přístup k těmto kritériím v meziročním srovnání výrazných změn směrem k prohlubování rozdílů. Vysoká korelace všech zkoumaných faktorů ve vztahu k pohlaví navíc potvrdila jeho důležitou roli v motivaci ke vzdělávání.

Klíčová slova: generace Z, pohlaví, motivace, online vzdělávání

There are countless factors that influence motivation and incentives for education. Elementary factors include psychic constructs such as personality, the self-concept, the emotional intelligence (Chrisler & McCreary, 2010; Voyer & Voyer, 2014; Carvalho, 2016; Herrera, Buitrago, & Cepero, 2017; Janošević & Petrović, 2019) and the values, attitudes and habits acquired during the life (Horváthová, Bláha & Čopíková, 2016). Another key descriptor of each person is their gender (Becirovic, 2017), which is addressed in a number of studies, the impact of which is amplified by the current exceeding of the gender limits (Dupont, 2015; Turner, 2015). In addition, formal education generally plays an irreplaceable role in education as such (Petranová, Hossová & Velický, 2017).

The reduction of educational interaction and the majority reduction in personal contact occurred in the Czech Republic in March 2020, when the Ministry of Health of the Czech Republic issued an extraordinary measure banning the personal presence of pupils and students at schools and school facilities with its effect from 11 March 2020 (Ministry of Health of the Czech Republic, 2020). At the beginning of the third month of 2020, similar restrictions have been applied worldwide, affecting almost 300 million pupils and students (UNESCO, 2020). In March 2020, schools were also closed in Belgium, Bulgaria, Denmark, France, Ireland, Italy, Hungary, Germany, the Netherlands, Norway, Poland, Portugal, Greece, Slovakia, Spain and Switzerland (Hospodářské noviny, 2020). School facilities in the United States, Alaska, Pakistan, Iran, Azerbaijan, China, Mongolia, Japan, Thailand and Vietnam were closed earlier than those in European countries (UNESCO, 2020). These countries moved teaching to an online format (Liguori & Winkler, 2020). More than 1.6 billion students worldwide have been affected, which is more than 91 % of all students (DeVaney, Shimshon, Rascoff *et al.*, 2020). It is, therefore, possible to speak about measures that directly affected a whole generation (Generation Z) in the area of education.

The current crisis is another important factor that has affected the lives of Generation Z. This generation has already been affected by frequent terrorist attacks, the Great Depression and the loosening of the moral principles established (Dupont, 2015; Turner, 2015). However, these interventions may be rather individual. The impact of the restrictions mentioned above affects almost all individuals referred to as Generation Z.

LITERARY RESEARCH

Generation Z are individuals born from the second half of the 1990s to the first decade of the 21st century (White, 2015; Horváthová, Bláha & Čopíková, 2016; Scott, 2016; Popova, 2017; Stillman & Stillman, 2017). Like the previous generation, Generation Z has its own specifics (Kirchmayer & Fratričová, 2020). This generation is very realistic because it has experienced a major economic crisis in the context of the time of terrorist attacks and the disintegration of traditions, including gender ones (Dupont, 2015; Turner, 2015). As a result, one-third of the Generation Z surveyed have their own business or are actively working to establish it (Barnes and Noble College, 2017), seeking independence (Royal Oxford Academy, 2018) and thus confirming its designation as a generation of strong individualists (Horváthová, Bláha & Čopíková, 2016), who are more responsible than all previous generations (The Annie E. Casey Foundation, 2016). Generation Z is also characterized by an excellent ability to adapt and collaborate, by orientation towards their own world, as they are used to moving in a digital (virtual) world (Chung & Chang, 2017; Seemiller & Grace, 2017; Hitka, Rózsa, Potkány *et al.*, 2019). Therefore, education using digital technologies should not only attract them but also help them to achieve better results (Chung & Chang, 2017). This characteristic feature is determined by the year 1995, which is associated with the emergence of the internet and the beginning of the arrival of Generation Z members in the world at the same time (Seemiller & Grace, 2017). However, this individuality is often perceived as egocentrism and the orientation to the inner world as unhealthy isolation from the outside world and dependence on virtual reality (Ng. Schweitzer, & Lyons, 2010; Berkup, 2014; Hitka, Rózsa, Potkány *et al.*, 2019).

Influenced by the circumstances, all educational institutions switched to online education in March 2020 (Liguori & Winkler, 2020). It was clear

that eradication after Covid-19 would bring education to a "new normal" (Sintema, 2020a; Toquero, 2020), where new perspectives and opportunities will need to focus on the goal, content, approach and evaluation of the formal education (Cahapay, 2020), in which the online modality will already be implemented (Mulenga & Marban, 2020; Naciri, Baba, Achmani *et al.*, 2020, Sintema, 2020b).

In addition to the advantages during the epidemic, online education also includes easier availability and convenience (Ostańkowicz-Bazan, 2016) but also disadvantages such as the risk of education devaluation, its effectiveness reduction and the deepening of the students and lecturers isolation (Horváthová, Bláha, Čpolíková, 2016; Barnes & Noble College, 2017). In this case, it is necessary to work with the idea that it is not essential to robotize people but to humanize technology (El Guindi, 2020). That could be achieved by developing appropriate educational structures (Olivier, 2020), teacher training (Obana, 2020; Olivier, 2020) and, of course, by providing an internet connection (Obana, 2020). In the case of education, the humanization of technology can also happen through gender specificities, because the performance and motivation for education based on digital technologies vary according to gender (Chung & Chang, 2017).

The concepts of motivation and incentives are perceived as a whole by some authors (Armstrong & Taylor, 2014; Pandit, 2015), while others divide them (Horváthová *et al.*, 2016) according to the fact, whether their source is internal (motivation) or external (incentives). Motivation is based on Maslow's Hierarchy of Needs (Abdulrahman *et al.*, 2018) and is shaped by the values, interests, attitudes and habits acquired (Horváthová, Bláha, Čopíková, 2016). Besides that, there are significant cognitive differences between different forms of learning (Chung & Chang, 2017), which are reflected in academic performance (Horváthová, Bláha, Čopíková, 2016; Chung & Chang, 2017) and are based on both, the values, interests, attitudes and habits achieved (Horváthová, Bláha, Čopíková, 2016), and the psychic constructions such as self-concept, personality and emotional intelligence (Carvalho, 2016; Herrera, Buitrago & Cepero, 2017; Janošević & Petrović, 2019).

Achieving goals through performance orientation increases men's motivation for learning with the help of digital technologies (Chung & Chang, 2017). Women are rather motivated by effective design (Beg *et al.*, 2011), via the appropriate instructional guidance (Hsu, 2013) and the focus on their individual goals and their social interactions with people of

the same age (Chung & Chang, 2017). There are opinions that the differences in motivation between men and women are determined primarily by the gender stereotypes perception (Chestnut & Markman, 2018; Heyder, Weidinger, & Steinmayr, 2021). On the one hand, these views are denied by the research, according to which there are no gender differences in the average learning outcomes (Else-Quest *et al.*, 2010) or motivation (Azarnoosh & Birjandi, 2012; Akram & Ghani, 2013). On the other hand, other studies have shown systematic gender differences in motivation (Henry, 2011), as well as the impact of gender on learning outcomes (Gustavsen, 2018).

Pupils and students belonging to the Z generation are motivated to learn by direct involvement in educational activities, which must, however, be based on their own decision, not on the initiative of the teacher (Popova, 2017). This state can be achieved only by providing a personal experience with the issue (Pandit, 2015; Horváthová, Bláha, Čopík, 2016), which must be passed to Generation Z interactively and dynamically and in conjunction with practical applicability (Pandit, 2015), ideally through digital technologies (Popova, 2017; Andheska, Suparno, Dawud *et al.*, 2020). To achieve these necessities, it is recommended to combine digital technologies with direct teaching and implement the so-called student-centred approach, i.e. the method of teaching focused on the student and his/her involvement in the educational process (Popová, 2017; Andheska, Suparno, Dawud *et al.*, 2020). That corresponds to the statement that Generation Z likes education and even prefers to apply new knowledge in practice (Pandit, 2015), the acquisition of which is based on commitment, which is considered another characteristic of this generation (American Management Association, 2018).

Online education is also supported by the fact that the most efficient way to motivate Generation Z for education is a short, clearly formulated praise for a task fulfilled and then follow-up recommendations (Popova, 2017), which should not be difficult for digital technologies to generate. The basic principle is to constantly reassure Gen-Z of their knowledge, abilities, and skills (Andryakov, 2018), and thanks to this their self-confidence and trust increase, which is considered a foundation stone of the ability to motivate these individuals (American Management Association, 2018). Again, digital technologies are one of the ways to achieve this most efficient way of motivation, where it is possible to monitor the achievement of the study goals, especially in the game concept, which can trigger internal and external incentives at the same time (Faber, 2015).

1. GOALS OF THE PAPER

The aim of this article is to evaluate the motivation for the education of Generation Z representatives with an emphasis on the form of education in a crisis situation according to gender. The research in this article builds on the research that categorized Generation Z representatives according to the individual approach in times of the educational interaction crisis published in January 2021 (Cernikova & Snydrova, 2020).

2. RESEARCH SURVEY METHODOLOGY

The aim of this article is to evaluate the motivation and incentives for the education of Generation Z with emphasis on the form of education in a crisis situation considering their gender. In this article, logical methods of formal type were applied, which are standardly used in scientific research. The induction method was used to present the theoretical basis and formulate the research results.

The following research questions were formulated within the research:

- How has Generation Z's perception of motivation and incentives to education from the parents' side changed due to the year-long crisis of educational interaction?
- How has Generation Z's perception of motivation and incentives to education from the teachers' side changed due to the year-long crisis of educational interaction?
- How has Generation Z's perception of the importance of education changed due to the year-long crisis of educational interaction?
- How has Generation Z's approach to non-formal education changed due to the year-long crisis of educational interaction?
- How have Generation Z's preferences for online learning in comparison with the traditional way of education changed due to the year-long crisis of educational interaction?

The quantitative data was obtained using a questionnaire survey. The qualitative data was acquired by conducting semi-structured interviews. The data obtained from the questionnaire survey was then used to test the hypotheses using the Wilcoxon test. The synthesis method then combined the results of

the research and theoretical knowledge, thanks to which the recommendations and conclusions of this paper were formulated.

The following hypotheses were formulated within the research:

- The motivation and incentives for education from the parents' side did not change during the year-long crisis of educational interaction in Generation Z.
- The motivation and incentives for education from the teachers' side did not change during the year-long crisis of educational interaction in Generation Z.
- The perception of the importance of education did not change during the year-long crisis of educational interaction in Generation Z.
- The approach to non-formal education did not change during the year-long crisis of educational interaction in Generation Z.
- The preference for online learning in comparison with the traditional way of education did not change during the year-long crisis of educational interaction in Generation Z.

The research presented in this paper was divided into two parts according to the time periods. The first research part was carried out through data collection in June 2020. The data collection was carried out through a questionnaire survey, which addressed a sample (n = 420) of respondents who belong to Generation Z on the basis of their year of birth. These were primary school pupils (n = 140), secondary school students (n = 140) and university students (n = 140). These respondents came from Prague and the Central Bohemian, South Bohemian and Ústí nad Labem Regions. Schools were chosen randomly, and respondents were selected by stratified random sampling (year of birth). Only fully completed questionnaires were included in the statistical data processing (n = 336). The questionnaire was completed by women (n = 168) and men (n = 168). For legislative reasons, no other gender choice was included in the questionnaire. In the women category, there were primary school students (n = 52), secondary school students (n = 61) and university students (n = 55). In the category of men, primary school pupils (n = 53), secondary school pupils (n = 67) and university students (n = 48) answered.

The data collection for the second part of the research took place in March and April 2021, exactly one year after the issuance of an extraordinary measure by the Ministry of Health of the Czech Republic, which prohibited the personal presence of pupils and students at schools and school facilities. The research was conducted on a sample of respondents

(n = 420) who correspond to the profile of Generation Z according to their year of birth. These were primary school pupils (n = 140), secondary school students (n = 140) and university students (n = 140) from Prague and the Central Bohemian, South Bohemian and Ústí nad Labem Regions. In the second part, the same respondents as in June 2020 were addressed. Only completed questionnaires were included in the statistical data processing (n = 348). The questionnaire was completed by women (n = 150) and men (n = 186). As in the first part, other genders were not included in the questionnaire for legislative reasons. In the category of women, primary school pupils (n = 52), secondary school pupils (n = 52) and university students (n = 46) answered. In the men category, primary school students (n = 56), secondary school students (n = 70) and university students (n = 60) answered. In the second research part, all respondents were presented with the same questionnaire as in the first research part. Respondents who were not included in one of the research sections were excluded from the subsequent hypothesis testing (n = 12).

The questionnaire was divided into a research part and a characteristic part. The characteristic part consisted of four questions, three were closed and one was evaluated using a four-point Likert scale. The research part of the questionnaire was divided into three sections of questions, which dealt with the motivating / incentive-giving factors of the individual from the parents and the teachers' side, with the perceptions of the importance of education, the approach to the non-formal education and the preference for online classes in comparison with the traditional education. The research part of the questionnaire consisted of a total of nineteen questions evaluated using four-point Likert scales. The questionnaire was designed to guarantee the anonymity of the respondents if necessary. Subsequently, the questionnaire was delivered to each respondent in person. In the introduction, each respondent was acquainted with the purpose of the questionnaire. The age difference of the respondents was a maximum of 10 years. The questions in the questionnaire were short and unambiguous. In the analysis, respondents were divided according to their level of education (primary school, secondary school, university).

The Wilcoxon test then compared year-on-year differences in the perception of the parameters monitored, see hypotheses above. The calculated test criterion W was compared with the tabulated critical value for the respective number n and the selected 5% level of significance. If the calculated

test criterion W is lesser than the critical value tabulated the hypothesis is rejected. If the calculated test criterion W is greater than the critical value tabulated the hypothesis cannot be rejected, i.e. the values do not differ before and after the educational crisis at the 50% level of significance.

3. RESULTS

This article focuses on assessing the Generation Z representatives' motivation and incentives for education, with an emphasis on the forms of education in a crisis situation with respect to their gender. The analysis was conducted for the areas of motivation and incentives in the crisis of educational interaction, the perceived importance of education, the interest in further education, the influence of parents and teachers and online education. Each of these factors was analysed and then tested separately in relation to the motivation and incentives for gender-dependent education. The results of the testing are recorded in Table II. Table I summarizes the proportions of respondents whose answers were classified in favour of the factors analysed.

Table I: *Year-on-year comparison of percentages of positive answers to research questions by gender*

Factor analyzed	June 2020		March–April 2021	
	Men	Women	Men	Women
Motivation and stimulation in the crisis	20 %	30.4 %	20 %	36.7 %
Motivation and stimulation from the parents	47.5 %	43.4 %	40 %	55.1 %
Motivation and stimulation from the teachers	10 %	43.5 %	17.1 %	26.5 %
The importance of education	75 %	65.2 %	68.6 %	87.8 %
Further education	27.5 %	34.8 %	60 %	51 %
Preference for online education	47.5 %	69.6 %	51.4 %	57.1 %

Source: own calculation

In Table I, we can see that the level of motivation and incentives for education did not change at all for the male part of the respondents during the year-long educational crisis. However, the proportion of the components that shape their motivation changed. For men, motivation and incentives from parents decreased by 7.5 %, and the ones from teachers increased by 7.1 %. During the crisis of educational interaction, in the category of women, the motivation and incentives for education increased by 6.3 %, and the influence of parents also increased (by 11.7 %) but the influence of teachers decreased significantly (by 17 %). That is probably due to the higher participation of the parents in the formal education of their children, as some of them may have been present during the teaching. In addition, teachers had the opportunity to share the schoolwork and homework on the same electronic platform, which both the parents and the pupils/students had access to. Respondents justified their answers qualitatively and showed that it was up to the teachers how they worked and helped their pupils/students in such a situation, paradoxically on a more personal level than during the traditional full-time studies or the daily school attendance. And so it was with the parents. Men often referred to the lack of space and freedom from the part of their parents, who mostly also worked remotely, while women welcomed the situation.

According to Table I, in June 2020, up to 75 % of men and slightly fewer women (65.2 %) considered education important. That also changed during the year when educational institutions operated on the basis of the extraordinary measures of the Ministry of Health. The number of women who consider education important increased by 22.6 %, and the number of men decreased by 6.4 %, as shown in Table I. From the data in Table I, it is clear that while at the beginning of the educational interaction crisis, education was more important for men than for women from this generation, in the course of time, these attitudes reversed, and the differences widened. Some respondents justified their views during the research survey. Women often stated that education fulfilled them, or that they believed that education would allow them to respond to unexpected changes more flexibly. Thus, it is possible that women from Generation Z perceive education to be a support for their own independence or self-awareness, which are still one of the most discussed and researched topics also in developed countries. That confirms women's orientation towards their own goals that was detected (Chung and Chang, 2017). During the research, the men stated that they liked activities

other than those offered by formal education, especially physical work or building a certain position in video games.

The above-mentioned performance of activities other than those offered by the school education was definitely reflected in another factor analysed, namely in further education. Table I shows that in June 2020, only 27.5 % of male respondents were educated in areas other than those provided by the school education. For women, it was 34.8 %, as shown in Table I. Table I also shows that a year later, that figure rose to 60 % for men and 51 % for women. The reason for the higher difference in men is described above.

The small year-on-year difference in the preference for online education over offline education is confirmed by the above-mentioned findings about men's and women's representatives. As can be seen in Table I, in March and April 2021, 51.4 % of the male respondents preferred online learning, which was 3.9 % more than a year ago. On the one hand, that confirms the interest in other activities, but on the other hand, these respondents stated that it was difficult for them to concentrate on online education, for some of them precisely because of their interest in other activities, and some find this kind of education useless because they see the benefits of the daily school attendance more in other areas, such as social skills and the stress management. Some proponents of online education stated that it is much more natural and less stressful for them to demonstrate their knowledge online. This finding confirms the opinion that Generation Z is digitally oriented (Chung & Chang, 2017; Seemiller & Grace, 2017) and can perform better in this environment than in non-virtual reality (Chung & Chang, 2017). However, this research did not find out whether better results were obtained in a fair way or whether there was some kind of cheating in the online exams. The reasons why it is more natural and less stressful for Generation Z to demonstrate their knowledge through a digital platform could also be explored further, i.e. whether it is based on the general characteristics of the Z generation mentioned above or whether there are other factors influencing these feelings. Better results can reduce stress levels, and lower stress levels can affect better learning outcomes.

Table I also shows that for women, the preference for online education fell by 12.8 %, but it is still more preferred by women than men. Respondents cited insufficient social interaction, the fact that the interpretation of the subject or the schoolwork was too abstract, and a psychological burden at possible personal meetings as the reason for the low preference for online education. That again confirms the orientation of Generation Z to the virtual

world (Chung & Chang, 2017; Seemiller & Grace, 2017) and also, especially for women, the need for appropriate instructional guidance (Hsu, 2013), the focus on social ties (Chung & Chang, 2017) and then the usability of the theoretical knowledge in practice (Pandit, 2015; Horváthová, Bláha & Čopíková, 2016). Undoubtedly, these elements are still a weakness of online education in the Czech Republic at all levels (just because it was generally considered temporary), and, therefore, women are losing interest in this type of education. Interestingly, respondents often stated that they did not learn as much as in the group of their real peers (47,6 %). Owing to this result and the existence of more than half of respondents who prefer online education, further research could be used to decipher the elements that are likely to create a penchant for isolation and virtuality but at the same time enable them to learn better in reality.

Based on the percentage points changes shown in Table I, it is possible to sum up for the next part of the statistical data processing that, in the case of Generation Z, the motivation for education varies according to gender.

The following hypotheses were tested using the Wilcox test:

- $H1_0$ - The motivation and incentives for education from the parents' side did not change during the year-on-year crisis of educational interaction in Generation Z.
- $H2_0$ - The motivation and incentives for education from the teachers' side did not change during the year-on-year crisis of educational interaction in Generation Z.
- $H3_0$ - The perception of the importance of education did not change during the year-long crisis of educational interaction in Generation Z.
- $H4_0$ - The approach to non-formal education did not change during the year-long crisis of educational interaction in Generation Z.
- $H5_0$ - The preference for online teaching compared to the traditional way of education did not change during the year-long crisis of educational interaction in Generation Z.

With regard to statistical inference, a nonparametric test to evaluate the state before and after the educational crisis was applied to test the samples. Only those values of the test criterion W would be considered significant changes when its value would be higher than the critical value tabulated.

Table II: *Testing criteria; women*

	$H1_0$ W	$H2_0$ W	$H3_0$ W	$H4_0$ W	$H5_0$ W	α
A (n = 35)	|54|	|32|	|-31|	|96|	|50|	195
B (n = 52)	|–59|	|63|	|40|	|-63|	|–60|	473
C (n = 46)	|34|	|13|	|35|	|-55|	|34|	279

source: own calculation

The calculated test criteria W are entered in Table II for the category of women and in Table III for the category of men, where they are compared with the critical value tabulated α for the respective number of respondents n in individual categories (A = primary school, B = secondary school, C = university) and at a 5% level of significance selected.

From the comparison of the test criteria and the critical values in Table II, it is clear that because for all hypotheses in all categories, the absolute value of W is lesser than the value of α; it is not possible to accept any null hypothesis. Table II shows that between 2020 and 2021, the Wilcoxon test did not find any statistically significant changes in women's motivation and incentives to education from the side of parents and teachers, as well as in the perceptions of the importance of education, the approach to the non-formal education, and there was no statistically significant change in the online teaching preferences. Although there were more significant percentage differences in the results in Table I, the Wilcoxon test did not evaluate them as statistically

Table III: *Testing criteria; men (source: own calculation)*

	$H1_0$ W	$H2_0$ W	$H3_0$ W	$H4_0$ W	$H5_0$ W	α
A (n = 53)	|32|	|34|	|–30|	|–48|	|–49|	208
B (n = 54)	|–61|	|42|	|–48|	|–74|	|–55|	557
C (n = 45)	|45|	|28|	|19|	|49|	|–46|	221

source: own calculation

significant at the 5% level of significance. Thus, in the category of women, the intervention only led to individual fluctuations in relation to the factors tested.

From the comparison of the test criteria and the critical values in Table III, it is clear that for all hypotheses in all categories, the absolute value of W is lesser than the value of α; it is not possible to accept any null hypothesis. Table III shows that between 2020 and 2021, the Wilcoxon test did not find any statistically significant changes in the motivation and incentives for education from the side of parents and teachers, as well as in the perception of the importance of education, the approach to the non-formal education, and there was no statistically significant change in the online teaching preferences. According to Table I, men did not have as significant percentage points changes in attitudes as women, and it can be concluded that for formally educated men belonging to Generation Z, the impact of the intervention monitored on the examined factors has not been very significant so far.

Looking into the future, education could be conceivably individualized as much as possible using information technology. It would thus be possible to obtain experts in specific fields, as individuals belonging to the Generation Z category are able to pay maximum attention to their areas of interest (Dupont, 2015; Horváthová, Bláha & Čopíková, 2016; Seemiller & Grace, 2017). At present, however, this direction may seem like a utopia, as online education is still seen as a temporary or alternative solution, not as its reform.

4. DISCUSSION

Generation Z students (and not only them) were forced to switch to digital education by an extraordinary measure of the Ministry of Health of the Czech Republic from March 2020, which prohibited the personal presence of pupils and students at schools and school facilities (Ministry of Health of the Czech Republic, 2020). In connection with the Covid-19 pandemic, not only educational interaction was limited but also all personal contact. Generation Z students are told to be strong individualists (Horváthová, Bláha & Čopíková, 2016) who focus on their own, especially digital (virtual), world (Ng, Schweitzer, & Lyons, 2010; Berkup, 2014; Hitka, Rózsa, Potkány *et al.*, 2019), but they are aware of their responsibility for their own lives more than previous generations (The Annie E. Casey Foundation, 2016)

and have an excellent ability to adapt to changing conditions at the same time (Chung & Chang, 2017). The new situation could prove to be an ideal environment for the lives of individuals from Generation Z. And so digital education should not only attract them but also help them to achieve better results (Chung & Chang, 2017).

The following points can be deduced from the results:

1) No statistically significant change in relation to the factors tested was found, either for men or women (Table II, Table III).
2) The level of motivation and incentives for education did not change at all for the male part of the respondents during the year-long educational crisis, and it increased by 6.3 % for women (Table I). As this finding rejects the claim that men are more motivated to learn through digital technologies than women (Chung & Chang, 2017), it is necessary to focus on the way and means of digital learning.
3) Year-on-year, men's perception of the importance of education has decreased, while women's perception has increased (Table I).
4) The preference for online education increased year-on-year among men (Table I). That corresponds to the need for dynamic teaching (Popova, 2017; Andheska *et al.*, 2020), which will be provided by digital technologies (Pandit, 2015; Popova, 2017; Andheska *et al.*, 2020).
5) For women, the preference for online teaching decreased by 12.8 %, but it is still more preferred by women than men (Table I). The decrease in preference was due to insufficient social interaction, which is crucial for them (Chung & Chang, 2017), and due to the psychological burden of possible personal meetings, which again confirms the orientation of Generation Z to the virtual world (Ng *et al.*, 2010; Berkup, 2014; Chung & Chang, 2017; Seemiller & Grace, 2017; Hitka *et al.*, 2019).

The research results clearly show that the year-on-year impact of the crisis of educational interaction on the factors observed had a different effect on women and men of Generation Z. However, there were no statistically significant year-on-year differences for either of the genders.

As can be seen, the results of the analytical part support, to some extent, the conclusions about the attitudes, behaviour, opinions and approaches of Generation Z from the theoretical part, here in relation to the motivation and incentives for education in times of the educational interaction

crisis. The benefit of this article can be spotted in providing an overview of the perception of the motivation and incentives for education via its digitization, which can be useful not only for the pedagogical but also for the subsequent managerial practice. In managerial practice, it is possible to use the knowledge, especially that about the Generation Z approaches, in human resource strategic planning and other activities related to human resource management, such as the recruitment and selection of employees, their training and development in relation to the career management and the remuneration. In pedagogical practice, the knowledge from this article can be used to streamline the educational process, thanks to the optimization of motivational incentives.

The limiting factor of this article was low interest in participating in the research, precisely because of the pandemic situation that caused the transformation in education. In the future, the research could focus on the evaluation of the specific modifications that have emerged from the final recommendations, as well as on their impact on Generation Z's motivation and incentives for education. This research could then be particularly useful in involving these individuals in the work process and in carrying out activities that fall within the field of human resource management.

CONCLUSION

The epidemiological situation has significantly affected the current approach to education, which was based on the direct contact between the teacher and the student. As a result of the Covid-19 pandemic, personal contacts were forced to be restricted in the spring of 2020, and the national, and in effect the almost pan-European, transition of educational activities to the online space was forced. That unprecedented change in the way of education fundamentally affected the motivation and incentives of pupils and teachers. The article focuses on key factors, i.e. the motivation and incentives influencing the approach tothe education of Generation Z members, categorized according to gender.

The aim of the article was to evaluate the motivation and incentives for the education of Generation Z members, i.e. the pupils and students, from the perspective of gender. It is known that there are significant cognitive differences between the genders in classical, frontal learning, which are reflected in their academic performance (Lowrie & Jorgensen, 2011; Horváthová, Bláha & Čopíková, 2016; Chung & Chang, 2017). Based on

the statistical evaluation of the study results, a high correlation between the gender of the respondent and the factors researched was proved (e.g. the importance of parents, teachers, the assessment of the importance of education, the online education preferences, etc.). The pupil/student is influenced by his/her motivation for learning in the case of online education, and previous surveys (Lowrie & Jorgensen., 2011; Horwáthová *et al.*, 2016; Chung *et al.* 2017) proved such a correlation in the case of the traditional direct education. In further research, it would be interesting to monitor how Generation Z members deal with difficult life situations and to examine the degree of their stress tolerance and management from the point of view of gender.

Acknowledgements

This contribution is a follow-up on the University of Economics and Management.

REFERENCES

Abdulrahman S., Brazdil P., van Rijn J., & Vanschoren J. (2018). Speeding up Algorithm Selection using Average Ranking and Active Testing by Introducing Runtime. *Machine Learning*, 107, pp. 79–108.

Akram, M., & Ghani, M. (2013). Gender and Language Learning Motivation, *Academic Research International*, Vol. 4, No. 2, pp. 536–540.

American Management Association. (2018) *Understanding the Characteristics and Motivations of Generation Z*, [Online], Available: https://playbook.amanet.org/training-articles-characteristics-motivations-generation-z/ [20 March 2019].

Andheska, H., Suparno, S., Dawud, D., & Suyitno, I. (2020) Writing Motivation and The Ability in Writing a Research Proposal of Generation Z Students Based on Cognitive Style, *Journal for the Education of Gifted Young Scientists,* Vol. 8, No. 1, pp. 87–104. http://doi.org/10.17478/jegys.651436

Andryakov, A. C. (2018). *What Keeps Generation Z Motivated at Workplace*, [online], Available: Tips to Keep Generation Z Motivated at Workplace (entrepreneur.com), [20 March 2019].

Armstrong M., & Taylor S. (2014). *Armstrong's Handbook of Human Resource Management Practice. 13th edition*, London: Kogan Page Limited 2014.

Azarnoosh, M. & Birjandi, P. (2012) Junior High School Students L2 Motivational Self System: Any Gender Differences'. *World Applied Sciences Journal*, Vol. 20, No. 4, pp. 577–584.

Barnes and Noble College (2017) *Getting to Know Gen Z*' | *Barnes and Noble College* [online], Available: https://www.bncollege.com/wp-content/uploads/2018/09/Gen-Z-Report.pdf [23 March 2019].

Becirovic, S. (2017). The Relationship between Gender, Motivation and Achievement in Learning English as a Foreign Language, *European Journal of Contemporary Education*, Vol. 6, No. 2, pp. 210–220. http://doi.org/10.13187/ejced.2017.2.210

Begy, J., & Consalvo, M. (2011). Achievements, Motivations and Rewards in Faunasphere. *Game Studies,* 11(1)

Berkup, S. B. (2014). Working with Generations X and Y in Generation Z Period, *Mediterranean Journal of Social Sciences*, Vol. 5, No. 19, pp. 218–229. https://doi.org/10.5901/mjss.2014.v5n19p218

Cahapay, M. B. (2020) Rethinking Education in the New Normal Post-COVID-19 Era: A Curriculum Studies Perspective. *Aquademia*, Vol. 4, No. 2, pp. 1–5. https://doi.org/10.29333/aquademia/8315

Carvalho, R. G. G. (2016) Gender Differences in Academic Achievement: The Mediating Role of Personality, *Personality and Individual Differences*, Vol. *94*, pp. 54–58.: https://doi.org/10.1016/j.paid.2016.01.011

Cernikova, I., & Snydrova, A. (2020) Motivace a stimulace ke vzdělávání-kategorizace zástupců generace Z podle individuálního přístupu v době krize edukativní interakce, *Ekonomické Listy*, Vol. 11, No. 1–2, pp. 3–16.

Chestnut, E. K., & Markman, E. M. (2018) Girls Are as Good as Boys at Math" Implies that Boys are Probably Better: A Study of Expressions of Gender Equality, *Cognitive Science*, Vol. 42, No. 7, pp. 2229–2249. https://doi.org/10.1111/cogs.12637

Chrisler, J. C., & McCreary, D. R. (2010) *Handbook of Gender Research in Psychology*. New York: Springer.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioural Sciences*. New Jersey: Lawrence Erlbaum.

DeVaney, J., Shimshon, G., Rascoff, M., & Maggioncalda, J. (2020) *How Can Universities Adapt during Covid-19?*, [Online], Available: https://www.timeshighereducation.com/sites/default/files/how-can-universities-adapt-covid19_whitepaper.pdf [10 May 2021].

Dupont, S. (2015). *Move Over Millennials, Here Comes Generation Z* [Online]. Available: https://stephendupont.co/move-over-millennials-here-comes-generation-z/ [28 May 2020].

Else-Quest, N. M., Hyde, J. S., & Linn, M. C. (2010) Cross-national Patterns of Gender Differences in Mathematics: A Meta-analysis. *Psychological Bulletin*, Vol. 136, No.1, pp. 103–127. https://doi.org/10.1037/a0018053

El Guindi, F. (2020). Reflections on Future Education: Ideas for a Model. *Cadmus*, Vol. 4, No. 2, pp. 273–281. https://doi.org/10.13140/RG.2.2.19798.80969

Faber, M. (2015). *Gamify Your Classroom: A Field to Game-based Learning.* New York: Peter Lang Publishing, Inc.

Gustavsen, A. M. (2018). Gender Differences in Academic Achievement: A Matter of Contextual Classroom Influence. *International Journal of Research*, Vol. 8, No. 1, pp. 1–20. http://doi.org/10.5861/ijrse.2018.2013

Henry, A (2011). Gender Differences in L2 Motivation: A Reassessment, in Davies, S., A., ed., *Gender gap: Causes. Experiences and Effects*, New York: Nova Science, pp. 81–102.

Herrera, L., Buitrago, R. E., & Cepero, S. (2017). 'Emotional Intelligence in Colombian Primary School Children. Location and Gender', *Universitas Psychologica*, Vo1. 6, No. 3, pp. 165–174. https://doi.org/10.11144/Javeriana.upsy16-3.eips

Heyder, A., Weidinger, A. F., & Steinmayr, R. (2021). Only a Burden for Females in Math? Gender and Domain Differences in the Relation Between Adolescents Fixed Mindsets and Motivation. *Journal of Youth and Adolescence*, Vol. 50, No. 9, pp. 177–188. https://doi.org/10.1007/s10964-020-01345-4

Hitka, M., Rózsa, Z., Potkány, M., & Ližbetinová, L. (2019). Factors Forming Employee Motivation Influenced by Regional and Age-related Differences. *Journal of Business Economics and Management*, Vol. 20, No. 4, pp. 674–693. https://doi.org/10.3846/jbem.2019.6586

Hsu, H. M. J. (2013). Gender Differences in Elementary School Students' Game Design Preferences. *International Journal of Information and Education Technology*, Vol. 3, No. 2, pp. 172. https://doi.org/10.7763/IJIET.2013.V3.258

Horváthová, P., Bláha, J., & Čopíková, A. (2016). *Řízení lidských zdrojů*. Prague: Management Press.

Hospodářské noviny (2020). *Evropa bojuje proti koronaviru. Některé země zavírají školy, Británie chce izolovat seniory* [Online]. Available: https://zahranicni.ihned.cz/c1-66735550-evropa-bojuje-proti-koronaviru-nektere-zeme-zaviraji-skoly-britanie-chce-izolovat-seniory. [28 May 2020].

Chung, L. Y., & Chang, R. C. (2017). The Effect of Gender on Motivation and Student Achievement in Digital Game-based Learning: A Case Study of a Contented-based Classroom, *Eurasia Journal of Mathematics*', *Science and Technology Education*, Vol. 13, No. 6, pp. 2309–2327. https://doi.org/10.12973/eurasia.2017.01227a

Janošević, M., & Petrović, B. (2019). Effects of Personality Traits and Social Status on Academic Achievement: Gender Differences. *Psychology in the Schools*, Vol. 56, No. 4, pp. 497–509. https://doi.org/10.1002/pits.22215

Kirchmayer, Z. , Fratričová. (2020). What Motivates Generation Z at Work?, Proceedings of the 31st IBIMA Conference on *Innovation Management and Education Excellence through Visión,* Milan, pp. 6019–6030.

Liguori, E., & Winkler, C. (2020). From Offline to Online: Challenges and Opportunities for Entrepreneurship Education following the COVID-19 Pandemic. *Entrepreneurship Education and Pedagogy*, Vol. 3, No. 1, pp. 1–6. https://doi.org/10.1177/2515127420916738

Lowrie, T., & Jorgensen, R. (2011). Gender Differences in Students' Mathematics Game Playing. *Computers and Education*, 57(4), 2244–2248. https://doi.org/10.1016/j.compedu.2011.06.010

Ministry of Public Health (2020). Mimořádné opatření – uzavření základních, středních a vysokých škol od 11. 3. 2020.

Mulenga, E. M., & Marban, J. M. (2020). Is COVID-19 the Gateway for Digital Learning in Mathematics Education? *Contemporary Educational Technology*, Vol. 12, No. 2, pp. 1–11. https://doi.org/10.30935/cedtech/7949

Naciri, A., Baba, M. A., Achbani, A., & Kharbach, A. (2020). Mobile Learning in Higher Education: Unavoidable Alternative during COVID-19. *Aquademia*, Vol. 4, No. 1, pp. 1–2. https://doi.org/10.29333/aquademia/8227

Ng, E. S. W., Schweitzer, L., & Lyons, S. T. (2010). New Generation, Great Expectations: A Field Study of the Millennia Generation. *Journal of Business and Psychology*, Vol. 25, No. 2, pp. 281–292. https://doi.org/10.1007/s10869-010-9159-4

Obana, J. (2020). *Could Educational Technology be a 'Holy Grail' amid Covid-19 Crisis?* [Online]. Available: https://www.manilatimes.net/2020/03/18/business/columnists-business/could-educational-technology-be-a-holy-grail-amid-covid-19-crisis/704202 [10 May 2021]

Olivier, W. (2020). Education post-COVID-19: Customised Blended Learning is Urgently Needed [Online]. Available: https://theconversation.com/education-post-covid-19-customised-blended-learning-is-urgently-needed-138647 [5 Oct 2021]

Ostańkowicz-Bazan, H. (2016). *Future Education* [Online]. Available: https://www.researchgate.net/publication/299280693_Future_Education [5 Oct 2021].

Pandit, V. (2015). *We are Generation Z: How Identity, Attitudes, and Perspectives are Shaping our Future*. USA: BookBaby.

Petranová, D., Hossová, M. & Velický, P. (2017). Current Development Trends of Media Literacy in European Union Countries. *Communication Today*, Vol. 8, No. 1, pp. 52.

Popova, S. (2017). Teaching Generation Z: Methodological Problems and Their Possible Solutions. *Training, Language and Culture*, Vol. 1, No. 4, pp. 28–46. https://doi.org/10.29366/2017tlc.1.4.2

Royal Oxford Academy (2018). *7 Unique Characteristics of Generation Z*' [Online]. Available: https://www.oxford-royale.com/articles/7-unique-characteristics-generation-z/ [2 June 2019].

Scott, R. (2016). *Get Ready For Generation Z*' [Online]. Available: https://www.forbes.com/sites/causeintegration/2016/11/28/get-ready-for-generation-z/#28882f392204 [12 Nov 2018].

Seemiller, C., & Grace, M. (2017). 'Generation Z: Educating and Engaging the Next Generation of Students'. *About Campus*, Vol. 22, No. 3, pp. 21–26. https://doi.org/10.1002/abc.21293

Sintema, E. J. (2020a). Effect of COVID-19 on the Performance of Grade 12 Students: Implications for STEM Education. *Eurasia Journal of Mathematics. Science and Technology Education*, Vol. 16, No. 7, pp. 1–6. https://doi.org/10.29333/ejmste/7893

Sintema, E. J. (2020b). E-Learning and Smart Revision Portal for Zambian Primary and Secondary School Learners: A Digitalized Virtual Classroom in the COVID-19 Era and beyond. *Aquademia*, Vol. 4, No. 2, pp. 1–2. https://doi.org/10.29333/aquademia/8253

Stillman, D., & Stillman, J. (2017). *Gen Z: How the Next Generation Is Transforming the Workplace*. New York: Collins. ISBN: 978-00-624-7545-9.

The Annie E. Casey (2016). *Generation Z Breaks Records in Education and Health Despite Growing Economic Instability of Their Families*' [Online]. Available: https://www.prnewswire.com/news-releases/generation-z-breaks-records-in-education-and-health-despite-growing-economic-instability-of-their-families-300287848.html [18 Nov 2018].

Toquero, C. M. (2020). Challenges and Opportunities for Higher Education amid the COVID-19 Pandemic: The Philippine Context. *Pedagogical Research*, Vol. 5, No. 4, pp. 1–5. https://doi.org/10.29333/pr/7947

Turner, A. (2015). Generation Z: Technology and Social Interest. *The Journal of Individual Psychology*, Vol. 71, No. 2, pp. 103–113. https://doi.org/10.1353/jip.2015.0021.

UNESCO. (2020). *Global Monitoring of Learners Affected by School Closures Caused by Covid–19* [Online]. Available: https://twitter.com/UNESCO/status/1235302315575455745?ref_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwterm%5E1235302315575455745%7Ctwgr%5E&ref_url=https%3A%2F%2Fwww.irozhlas.cz%2Fzpravy-svet%2Fkoronavirus-unesco-preventivni-opatreni-uzavrene-skoly_2003051254_sot [28 May 2020]

Voyer, D., Voyer, S. D. (2014). Gender Differences in Scholastic Achievement: A Meta-analysis. *Psychological Bulletin*, Vol. 140, No. 4, pp. 1174. https://doi.org/10.1037/a0036620

White, S. (2015). *The Generation Z Effect* [Online]. Available: https://www.theglobeandmail.com/news/national/education/canadian-university-report/the-genz-effect/article26898388/ [12 Nov 2018]

Kontakt

Ing. Iveta Černíková, MSc.: icernikova@email.cz

PhDr. Ivana Šnýdrová, CSc.: ivana.snydrova@vsem.cz

https://doi.org/10.11118/lifele20231301007