

THE RELATIONSHIP BETWEEN WORK ENGAGEMENT OF DIFFERENT GENERATIONS AND MOBILE LEARNING

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Abstract

As regards work engagement, different generations are affected by different factors. The aim of this paper is to determine whether there is a relationship between work engagement and mobile learning and whether there are significant variances between work engagement and mobile learning among different generational cohorts. Methods: Quantitative research was performed using “Individual Innovativeness Scale” developed by Hurt, Joseph and Cook (1977) and “The Mobile Learning Scale (MBC)”, formed by Fatima, Ghandforoush, Khan and Masico (2017), applying the Technology Acceptance Model (TAM). The research included 231 representatives of different generations working in the organisations which used mobile learning in workplace and employed representatives of all four generations in Lithuania, EU. For statistical analysis two-way ANOVA was used, followed by post hoc pairwise comparisons (Bonferroni correction). Findings: There are significant differences in work engagement by different generations and mobile learning. Vigor, dedication and absorption were significantly affected by generation and by mobile learning. Conclusions: Generation X and Generation Y are more engaged in the workplace than Generation Z. Generation Z is more prone to using mobile learning in the workplace than Generation X and Generation Y; in comparison to other generations, the Baby Boomers are least prone to using mobile learning in the workplace. Recommendation: A focus on Generation Z mobile learning in the workplace would increase their work engagement.

Keywords: work engagement, generation, different generations, mobile learning

INTRODUCTION

In today's labour market, several generations are working actively: Generation X, Generation Y, Generation Z are gradually entering the labour market, and the Baby Boomers' Generation are leaving the labour market. Many scholars agree that there are generational differences that affect the results of the performance of organisations (Smola and Sutton, 2002; Alsop, 2008; Twenge, 2010). Some of the most important factors that have a significant impact on the activities and results of organisations

are work engagement (Shuck and Wollard, 2010) and the employees' lifelong learning ability (Hillman, 2014). Currently, work engagement is one of the most popular practices in Human Resources Management (HRM) and one of the leading topics among researchers (Shuck and Wollard, 2010). The article is based on the conceptualisation of Schaufeli, Salanova, Roma and Bakker (2002) that work engagement is “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (p. 74), and it

analyses a relationship between work engagement of different generations and mobile learning.

Greater work engagement of employees is an essential prerequisite for successful performance of an organisation and an increased competitive advantage in business (Bakker and Schaufeli, 2008; Schaufeli, 2013; Hoole and Bonnema, 2015; Bakker and Albrecht, 2018). In most cases, the level of work engagement in organisations is not very high, and therefore it is important to look for solutions to increase work engagement of employees in organisations. According to Hoole and Bonnema (2015), in order to increase work engagement, a lot of attention has recently been paid to financial incentives (pay raise, additional benefits for employees, etc.); however, many HRM scholars and practitioners (McBain, 2007; James, McKechnie and Swanberg, 2011; Park and Gursoy, 2012) indicate that different generations are affected by different factors as regards work engagement. Hillman (2014) assumes that learning is yet another essential difference among generations. The article explores the growing popularity of mobile learning, as new technologies are rapidly pushing away the old learning techniques and becoming mainstream; the learning efficacy will increase, and the training cost reduces (Khadim, 2018). This is especially true of younger generations, i.e. Generation Y and Generation Z, where not only meaningful work (Hoole and Bonnema, 2015), but also on-the-job learning and application of modern learning methods in workplace (Partridge and Hallam, 2006; Monaco and Martin, 2007; Bohl, 2008; Wilson and Gerber, 2008) make an impact on work engagement. Emerging technologies, and especially their application to mobile learning, are becoming a necessity for a modern organisation, enabling enhanced autonomy and flexibility of an employee (Siering and Pahlke, 2013), and at the same time successful work engagement of employees.

As generations and differences among generations are becoming an increasingly significant factor of diversity in an organisation, it is important to better understand work engagement and dynamics of teaching methods (for example, mobile learning) in different generational cohorts (Brown and Chalmers, 2003; Fatima, Ghandforoush, Khan and Masico, 2017). So it is important to consider how mobile learning can help increase work engagement of different generations. This article analyses theoretically and empirically the relationship between work engagement of different generations and mobile learning. The main research question: are there differences in work engagement by different generations and mobile learning?

The aim of this research is to determine whether there is a relationship between work engagement and mobile learning and whether there are significant variances between work engagement and mobile learning among different generational cohorts.

The Theoretical Aspects

The theoretical aspects of work engagement of different generations

The 20th century calls for a high level of proficiency and productivity of employees more than ever before, thus work engagement is attracting more and more attention from scholars and business practitioners (Macey, Schneider, Barbera and Young, 2011). As the economic and social conditions are changing more rapidly than ever before, new generations are forming, the obvious differences among which are leading to a revision of the entire organisation's staff management policy in order to increase work engagement of employees from different generations.

According to Twenge, Campbell, Hoffman and Lance (2010), the labour market today consists of individuals from several generations: the Baby Boomers (born 1946–1964), Generation X (born 1965–1981), and Generation Y (born 1982–1999). Gradually, the Baby Boomers are leaving the labour market, while Generation Z (born since 2000) are entering the labour market (Wheatley and Hibbler-Britt, 2019). According to the Theory of Generations, generations are divided into groups of people of similar age, which share historical and social experience in the most significant periods of development (Howe and Strauss, 2000; Perry, Golom, Catenacci, Ingraham, Covais and Molina, 2017).

The Baby Boomers are being described as loyal to their organisation, appreciating and respecting authority, independent, diligent and responsible at work (Becton, Walker and Jones Farmer, 2014). The Baby Boomers are more prone to working hard and are higher in self-reliance and work centrality than younger generations (Meriac, Woehr and Banister, 2010), and they value work more than younger generations, because the Baby Boomers see work as being more central to their lives in comparison to younger generations (Park and Gursoy, 2012).

The employees of Generation X are individualistic and tend to be independent and more career focused (Park and Gursoy, 2012), and they seek challenges and better opportunities to develop their career (Kupperschmidt, 2000). Organisations need to be aware of the career goals of Generation X employees, and they should provide attuned opportunities which match their career aspirations (Chawla, Dokadia and Rai, 2017).

Generation Y more than other generations value leisure and seek for work-life balance, they like diversity and changes, and want to do only meaningful work (Becton, Walker and Jones-Farmer, 2014). Generation Y is characterised by such values as flexibility, mobility, broad but superficial knowledge, success orientation, creativity, freedom of information, and IT is a part of their everyday life; the representatives of this generation do not

tolerate monotony, individualistic actions or tasks which require thinking (Bencsik, Horvath-Csikos and Juhasz, 2016).

Generation Z is referred to as the Internet generation (Tapscott, 2010; Lebioda, Hahn and Martins, 2019). Generation Z is the first real global, careerist, professionally ambitious generation, and their technical and language knowledge are on a high level (Bencsik, Horvath-Csikos and Juhasz, 2016). Generation Z is also very socially conscious (Turner, 2015).

Generally, several main generational differences are highlighted in scientific literature (Urick, Hollensbe, Masterson and Lyons, 2016), including careers (Twenge, 2010; Lyons, Schweitzer and Ng, 2015), lifecycles (Lyons, Duxbury and Higgins, 2005), work values (Cogin, 2012), personality (Wong, Gardiner, Lang and Coulon, 2008), leadership (Sessa, Kabacoff, Deal and Brown, 2007), learning (Hillman, 2014) and work engagement (Bai and Liu, 2018).

Scientific literature emphasises that personal commitment to work, and at the same time work engagement, are most dependent of a generation (Twenge, 2010). According to Hu and Wang (2014), work engagement is understood as an active, integrated and persistent state of an individual in work. According to Shuck and Wollard (2010, p. 90), “the outcomes of employee engagement are advocated to be exactly what most organizations are seeking: employees who are more productive, profitable, safer, healthier, less likely to turnover, less likely to be absent, and more willing to engage in discretionary efforts” (Buchanan, 2004; Wagner and Harter, 2006; Fleming and Asplund, 2007). According to Czarnowsky (2008, p. 6), “engaged employees are mentally and emotionally invested in their work and in contributing to their employer’s success”. Shuck and Wollard (2010, p. 103) indicate that work engagement can be defined as “an individual employee’s cognitive, emotional, and behavioral state directed toward desired organizational outcomes”. According to Guan and Frenkel (2018, p. 593), engaged employees tend to participate in proactive crafting (Salanova and Schaufeli, 2008), tailoring their jobs to fit their work goals and the environment to achieve higher employee performance (Lu, Wang, Lu, Du and Bakker, 2014; Tims, Bakker and Derk, 2015). Work engagement is also important because it connects employees to their organisation (Welch, 2011). Macey *et al.* (2009) emphasise that work engagement has a direct value to organisational effectiveness.

The research is based on:

1. The Theory of Generations, according to which generations include individuals who were born over the same period and share social and historical events (Howe and Strauss, 2000).
2. The conceptualisation of Schaufeli *et al.* (2002, p. 74), who defined work engagement as, “a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption”: vigor is generally defined as employees’ enthusiasm, resilience and determination in their work; dedication is characterised by employees’ sense of pride, inspiration, and significance in their work roles; absorption indicates employee’s complete engrossment in work.

The theoretical aspects of mobile learning in workplace

Industry 4.0 has triggered a real breakthrough in work processes, including education of workers in workplace (Jaschke, 2014). To maintain and increase competitive advantage, modern organisations have to apply emerging technologies in workplace learning in many different ways regarding learning content management systems, social media and social interaction, mobile and ubiquitous learning facilities, computer simulations and immersive virtual reality, educational data mining and learning analytics, computer-based learning assistance, and cognitive processing and high-order thinking facilities (Wang, 2018). According to Khadim (2018), the emerging technologies and tools have paved the way for learning that can harness the power, speed, and ubiquity of digital capability, so it is important to consider how mobile learning can help increase the work engagement of different generations.

Mobile phones dominate in all areas of life and are increasingly being used in organisations in the process of learning. There are several approaches and definitions for mobile learning highlighted in scientific literature. According to Kilis (2013), if initially, in the description and use of mobile learning, the focus was primarily on technology (Kilis, 2013), at a later stage, the emphasis was laid on mobility (Sampangi, Viswanath and Ray, 2010), the ability to work and/or learn anywhere at any time (Kadirire, 2009; Mockus, Dawson, Edel-Malizia, Shaffer, An and Swaggerty, 2011), the intersection of mobile computing and electronic learning (Suki and Suki, 2011), the opportunity to bring mobile learning directly to the workplace (Baccari, Mendes, Nicolle, Soualah-Alila and Neji, 2016; Engelmann and Schwabe, 2018).

Laberge, Tondoux, Blanchard, Tremblay and Girard (2018) assume that if mobile learning or other IT tools are to be used in workplaces, technologies must be operative (i.e. useable and useful at the moment required). This is especially true teaching Generation Y (Shaw and Fairhurst, 2008; Bohl, 2008) or Generation Z in the workplace, as these are generations brought up with emerging technologies, and therefore seeking for an active learning style (Skiba and Barton, 2006). Scholars have found that passive learning techniques are

ineffective and inconsistent with the newest Generations – Y and Z (Hallam, 2006; Monaco and Martin, 2007; Bohl, 2008; Wilson and Gerber, 2008; Farrell and Hurt, 2014).

The article is based on

1. The Mobile Learning Theory highlighted by Keskin and Metcalf (2011, pp. 203–204) – Lifelong learning (“Lifelong information and interaction with education content in mobile learning”. According to Sharples (2000), learning happens all the time and is influenced by both, our environment and the particular situations we are faced with;
2. The Technology Acceptance Model (TAM): TAM research involving mobile learning studies and form an essential reference for scholars in the mobile learning context (Al-Emran, Mezhujev and Kamaludin, 2018); there are six sub-dimensions of mobile learning (Fatima, Ghandforoush, Khan and Masico, 2017): perceived usefulness, attitude, perceived ease of use, intention for adoption, innovativeness, self-efficacy. TAM determines the indirect effect on the intentions through the operational factors (perceived usefulness and perceived ease of use) of the particular system (Rehman, Anjum, Askri, Kamran and Esichaikul, 2016); attitude is an individual’s positive or negative feelings about performing the target behaviour (Davis, 1989); mobile self-efficacy, personal innovativeness and intention for adoption are important variables in the new learning environment involving information technology (Mahat, Ayub and Luan, 2012).

MATERIALS AND METHODS

Having discussed the theoretical aspects of work engagement of different generations and the theoretical aspects of mobile learning in workplace, the main research question was formulated: are there differences in work engagement by different generations and mobile learning?

The formulation of this research hypothesis was based on the Theory of Generations (Howe and Strauss, 2000), conceptualisation of Schaufeli *et al.* (2002) regarding work engagement, the Mobile Learning Theory of Lifelong learning (Sharples, 2000; Keskin and Metcalf, 2011) and the Technology Acceptance Model (TAM) (Fatima *et al.*, 2017): The following research hypotheses were raised:

- H0: There are no significant differences in work engagement by different generations and mobile learning.
- H1: There are significant differences in work engagement by different generations and mobile learning.
- H2: Vigor (sub-dimension of work engagement) was significantly affected by generation and by mobile learning.

H3: Dedication (sub-dimension of work engagement) was significantly affected by generation and by mobile learning.

H4: Absorption (sub-dimension of work engagement) was significantly affected by generation and by mobile learning.

The quantitative research was carried out in March-August 2018 in Lithuania, EU.

The following research data collection methods were applied: scientific literature analysis, a questionnaire survey. A survey is a data-collection technique widely used in research to forecast the attitude to IT (Liaw, Huang and Chen, 2007).

The research stages. The first stage of the research included sending e-mails to Lithuanian organisations in order to find out which organisations used mobile learning in workplace. At the second stage, an attempt was made to clarify if employees of all generations were employed in the organisations that used mobile learning in workplace. Organisations met the two criteria, required for the research, i.e.:

1. they used mobile learning in the workplace and
2. employed representatives from all four generations, and agreed to participate in the research. At the third stage, research was carried out in the selected organisations.

Instruments. The first part of the questionnaire included work engagement. It was measured by a nine-item Utrecht Work Engagement Scale (UWES) developed by Schaufeli, Bakker and Salanova (2006). The UWES-9 had three sub-dimensions of work engagement: vigor, dedication and absorption. All items were scored on a 7-point frequency rating scale ranging from 0 (never) to 6 (always). According to Guan and Frenkel (2018), this scale yielded a Cronbach’s alpha of 0.88. In this research Cronbach’s alpha was for each UWES-9 subscale range from 0.986 to 0.990 (high): vigor – Cronbach’s alpha 0.986, dedication – Cronbach’s alpha 0.990 and absorption – Cronbach’s alpha 0.988.

The second part was taken from similar studies for mobile learning that intended to identify intention toward the adoption of technology, formed by Fatima, Ghandforoush, Khan and Masico (2017), applying the Technology Acceptance Model (TAM) (Kenny, Van Neste-Kenny, Burton, Park and Qayyum, 2012; Sánchez-Prieto, Olmos-Migueláñez and García-Peñalvo, 2016). The Mobile Learning Scale had six sub-dimensions of mobile learning: perceived usefulness, attitude, perceived ease of use, intention for adoption, innovativeness, self-efficacy. A five-point Likert scale was used to capture the responses (ranging from 1 – strongly disagree, 2 – disagree, 3 – neutral, 4 – agree and 5 – strongly agree). In this research Cronbach’s alpha was for each MBC subscale range from 0.949 to 0.967 (high): perceived usefulness – Cronbach’s alpha 0.958, attitude – Cronbach’s alpha 0.952, perceived

ease of use – Cronbach's alpha 0.951, intention for adoption – Cronbach's alpha 0.949, innovativeness – Cronbach's alpha 0.961, self-efficacy – Cronbach's alpha 0.967.

The third part of the questionnaire included demographic information of the participants, which allowed attributing each individual to one of four generations.

Sample. The research included 231 representatives of different generations working in the organisations which used mobile learning in workplace and employed representatives of all four generations in Lithuania, EU. Each employee was attributed to one of the four generations (the Baby Boomers' Generation, Generation X, Generation Y, Generation Z), based on the Theory of Generations by the date of birth (Howe and Strauss, 2000).

Demographic Characteristics of the Sample. The research included 231 respondents subjected to analysis: 54.5% of the sample ($n = 126$) were female; the other 45.5% ($n = 105$) were male.

The International Standard Classification of Education (ISCED) is a framework for assembling, compiling and analysing cross-nationally comparable statistics on education. According to their education, the respondents have distributed as follows: 54.5% of respondents had a higher education level (ISCED: post-secondary, tertiary, higher; $n = 126$); 26% a medium education level (ISCED: vocational lower secondary, general upper secondary, vocational upper secondary, special upper secondary; $n = 60$); 19.5% a low education level (ISCED: no primary, primary, vocational qualification without completion of general lower secondary, general lower secondary; $n = 45$). The distribution of respondents corresponds to the general sample. According to EUROSTAT statistics, Lithuania has the highest tertiary educational attainment rate in the EU (EUROSTAT, 2018).

According to the date of birth, respondents were attributed to four different generations: 19.91% as the Baby Boomers ($n = 46$), 41.13% as the Generation X ($n = 95$), 28.14% as the Generation Y ($n = 65$), 10.82% as the Generation Z ($n = 25$).

The data obtained from the research was analysed by the statistical software package SPSS 22.0. For statistical analysis two-way ANOVA was used, followed by post hoc pairwise comparisons (Bonferroni correction). According to Michaelson and Hardin (2010), pairwise comparisons are methods for analysing multiple population means in pairs to determine whether they are significantly different from one another. This entry explores the concept of pair-wise comparisons, various approaches, and key considerations when performing such comparisons (p. 986).

Research limitations. One of the main research limitations is related to the aim of the research, i.e. to achieve the aim of the research, organisations had to meet two criteria: to use mobile learning in

workplace and to employ representatives of four generations. Only 6 organisations met the two criteria and agreed to participate in the research, thus the research was based only on 6 organisations in Lithuania, EU. Although the research sample is reflecting a current distribution of four generations in the Lithuanian and EU labour markets, where the Baby Boomers are slowly leaving the labour market, the representatives of Generation X are still holding a strong position in the labour market, Generation Y is strengthening their position in the labour market, and Generation Z is entering the labour market (i.e. the representatives of Generation Z currently comprise the smallest share of the labour market) (Bencsik, Horvath-Csikos and Juhasz, 2016), it is possible to highlight yet another research limitation – the uneven number of respondents in four generations.

The research ethics. The research was based on the principle of goodwill, respect for the dignity of an individual, justice, the right to accurate information, anonymity and data protection. First of all, the respondents were informed about the purpose and course of the research, and their personal consent to participate in the research was received. The researched were informed that their participation in the research was their individual decision and they were free to refuse to participate in the research or to stop participating in the research at any time. The same information was provided to the managers of the organisations, who made it possible to conduct the survey in specific organisations. The participants of the research were informed that their participation in the research would not affect their working status and would not cause any risk; the respondents were not asked to disclose personal information, thus ensuring their anonymity; the obtained data were analysed by the author of the research, and the data were not used by any other individuals. Having analysed and interpreted the obtained data, the computer files containing unprocessed data were deleted.

RESULTS AND DISCUSSION

According to Schaufeli (2017), levels of engagement differ across Europe, they are highest in Northwestern Europe and the Alpine region, and lowest in Southern Europe and on the Balkans and in Turkey. Lithuania is a country with a high work engagement level – 4.14 (highly engaged – higher than 4; moderately engaged – 3.8–4; little engaged – lower than 3.8; comparing to the EU average score of work engagement 3.94) (p. 101).

Based on the mean score of work engagement in this research (Tab. I), $\bar{x} = 4.60$ of the Baby Boomers, $\bar{x} = 4.84$ of the Generation X, $\bar{x} = 4.45$ of the Generation Y, $\bar{x} = 3.78$ of the Generation Z; it means that the Baby Boomers, Generation X and Generation Y are more engaged in the workplace

I: Descriptive statistics (Mean) of participants, $p < 0.05$

| Generation | Work engagement | | | | Mobile learning | | | | | | |
|--------------|-----------------|-------------|-------------|-------------|-----------------|----------------------|-------------|-----------------------|------------------------|----------------|---------------|
| | TOTAL | Vigor | Dedication | Absorption | TOTAL | Perceived usefulness | Attitude | Perceived ease of use | Intention for adoption | Innovativeness | Self-efficacy |
| Baby Boomers | 4.60 | 4.55 | 4.61 | 4.63 | 2.53 | 2.57 | 2.64 | 2.43 | 2.59 | 2.41 | 2.53 |
| Generation X | 4.84 | 4.83 | 4.78 | 4.90 | 2.98 | 3.12 | 3.17 | 2.81 | 2.97 | 2.61 | 3.23 |
| Generation Y | 4.45 | 4.35 | 4.46 | 4.54 | 2.98 | 3.53 | 3.26 | 2.80 | 2.95 | 2.24 | 2.95 |
| Generation Z | 3.78 | 3.80 | 3.88 | 3.67 | 4.62 | 4.65 | 4.60 | 4.67 | 4.60 | 4.60 | 4.60 |
| Total | 4.57 | 4.53 | 4.56 | 4.61 | 3.07 | 3.29 | 3.25 | 2.93 | 3.07 | 2.68 | 3.16 |

(highly engaged) than Generation Z (moderately engaged) in the workplace ($p < 0.05$).

The obtained research results are compatible with the findings of the research works conducted by Coetzee, Ferreira and Shunmugum (2017), which provide “that work engagement is likely to be influenced by an individual’s generational cohort” and “the Baby Boomers showed higher levels of work engagement than the other two generational cohorts” (p. 9). According to Hoole and Bonnema (2015), the findings suggest that older employees are still very valuable resources and can contribute significantly to the organisation’s success, but have different needs and values than other age groups.

Based on the mean score of mobile learning in this research (Tab. I), $\bar{x} = 2.53$ of the Baby Boomers $\bar{x} = 2.98$ of the Generation X, $\bar{x} = 2.98$ of the Generation Y, $\bar{x} = 4.62$ of the Generation Z; it means that the Generation Z is more prone to using mobile learning in the workplace than Generation X and Generation Y; the Baby Boomers are least prone to using mobile learning than other generations in the workplace ($p < 0.05$). The obtained results confirm the views of researchers that the Baby Boomers

are the least of all generations prone to using new technology, including active usage of mobile technology (Yusof, Mokhtar and Set, 2019; Poulouva, Klimova and Pulkrabkova, 2019).

For statistical analysis two-way ANOVA was used, followed by post hoc pairwise comparisons (Bonferroni correction). Two-way ANOVA indicated that work engagement was significantly affected by generation ($F = 6.73$, $df = 3$, $p = 0.000 < 0.05$) and by mobile learning ($F = 15.53$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and mobile learning ($F = 11.13$, $df = 3$, $p = 0.000 < 0.05$) (Tab. II). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation’s Z mobile learning was more significantly associated with work engagement than that of other generations: Baby Boomers ($p = 0.035 < 0.05$) and Generation X ($p = 0.003 < 0.05$).

Two-way ANOVA indicated that work engagement was significantly affected by generation ($F = 12.76$, $df = 3$, $p = 0.000 < 0.05$) and by perceived usefulness of mobile learning ($F = 45.98$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction

II: Work engagement of participants among different generations according to mobile learning (Tests of Between-Subjects Effects, ANOVA)

| Dependent Variable: Work engagement | | | | | | | |
|-------------------------------------|-------------------------|----------|--------------|---------------|-------------|---------------------|--|
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared | |
| Corrected Model | 31.351 ^a | 8 | 3.919 | 8.650 | .000 | .238 | |
| Intercept | 370.037 | 1 | 370.037 | 816.744 | .000 | .786 | |
| Generation | 9.151 | 3 | 3.050 | 6.733 | .000 | .083 | |
| Mobile learning | 14.073 | 2 | 7.037 | 15.531 | .000 | .123 | |
| Generation * Mobile learning | 15.126 | 3 | 5.042 | 11.129 | .000 | .131 | |
| Error | 100.580 | 222 | .453 | | | | |
| Total | 592.000 | 231 | | | | | |
| Corrected Total | 131.931 | 230 | | | | | |

a. R Squared = .238 (Adjusted R Squared = .210)

between the generation and perceived usefulness of mobile learning ($F = 19.01$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z perceived usefulness of mobile learning was more significantly associated with work engagement than that of other generations: Baby Boomers ($p = 0.006 < 0.05$) and Generation X ($p = 0.000 < 0.05$).

Two-way ANOVA indicated that work engagement was significantly affected by generation ($F = 9.59$, $df = 3$, $p = 0.000 < 0.05$) and by innovativeness of mobile learning ($F = 25.65$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and attitude to mobile learning ($F = 15.00$, $df = 3$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z attitude to mobile learning was more significantly associated with work engagement than that of other generations: Baby Boomers ($p = 0.023 < 0.05$) and Generation X ($p = 0.000 < 0.05$).

Two-way ANOVA indicated that work engagement was significantly affected by generation ($F = 4.75$, $df = 3$, $p = 0.003 < 0.05$) and by perceived ease of mobile learning use ($F = 14.55$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and perceived ease of mobile learning use ($F = 4.42$, $df = 4$, $p = 0.002 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z perceived ease of mobile learning use was more significantly associated with work engagement than that of other generations: Baby Boomers ($p = 0.017 < 0.05$) and Generation X ($p = 0.007 < 0.05$).

Two-way ANOVA indicated that work engagement was significantly affected by generation ($F = 9.18$, $df = 3$, $p = 0.000 < 0.05$) and by intention for adoption of mobile learning ($F = 24.18$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and intention for adoption

of mobile learning ($F = 11.14$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z intention for adoption of mobile learning was more significantly associated with work engagement than that of other generations: Baby Boomers ($p = 0.015 < 0.05$) and Generation X ($p = 0.001 < 0.05$).

Two-way ANOVA indicated that work engagement was significantly affected by generation ($F = 6.37$, $df = 3$, $p = 0.000 < 0.05$) and by innovativeness of mobile learning ($F = 10.34$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and innovativeness of mobile learning ($F = 2.66$, $df = 4$, $p = 0.034 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z innovativeness of mobile learning was more significantly associated with work engagement than that of other generations: Baby Boomers ($p = 0.026 < 0.05$), Generation X ($p = 0.004 < 0.05$) and Generation Y ($p = 0.012 < 0.05$).

Two-way ANOVA indicated that work engagement was significantly affected by generation ($F = 9.8$, $df = 3$, $p = 0.000 < 0.05$) and by self-efficacy to mobile learning ($F = 25.48$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and self-efficacy to mobile learning ($F = 10.81$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z self-efficacy to mobile learning was more significantly associated with work engagement than that of other generations: Baby Boomers ($p = 0.014 < 0.05$) and Generation X ($p = 0.002 < 0.05$).

Based on two-way ANOVA tests results, one can assume that the hypothesis H0 (H0: There are no significant differences in work engagement by different generations and mobile learning) is not confirmed and the hypothesis H1 (H1: There are significant differences in work engagement by different generations and mobile learning) is

III: *Vigor of participants among different generations according to mobile learning (Tests of Between-Subjects Effects, ANOVA)*

| Dependent Variable: Vigor | | | | | | |
|------------------------------|-------------------------|-----|-------------|---------|------|---------------------|
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
| Corrected Model | 31.097 ^a | 8 | 3.887 | 7.413 | .000 | .211 |
| Intercept | 402.339 | 1 | 402.339 | 767.281 | .000 | .776 |
| Generation | 11.519 | 3 | 3.840 | 7.322 | .000 | .090 |
| Mobile learning | 13.554 | 2 | 6.777 | 12.924 | .000 | .104 |
| Generation * Mobile learning | 14.783 | 3 | 4.928 | 9.397 | .000 | .113 |
| Error | 116.410 | 222 | .524 | | | |
| Total | 645.000 | 231 | | | | |
| Corrected Total | 147.506 | 230 | | | | |

a. R Squared = .211 (Adjusted R Squared = .182)

confirmed. The research results confirm the views of other researchers that there are generational differences in the workplace (Wong, Gardiner, Lang and Coulon, 2008; Twenge, 2010; Cugin, 2012; Lyons, Schweitzer and Ng, 2015; Bai and Liu, 2018), learning (Hillman, 2014) and mobile technology usage among the employees of different generations (Lebioda, Hahn and Martins, 2019).

Two-way ANOVA indicated that vigor (sub-dimension of work engagement) was significantly affected by generation ($F = 7.32$, $df = 3$, $p = 0.000 < 0.05$) and by mobile learning ($F = 12.92$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and mobile learning ($F = 9.397$, $df = 3$, $p = 0.000 < 0.05$) (Tab. III). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z mobile learning was more significantly associated with vigor than that of other generations: Baby Boomers ($p = 0.008 < 0.05$), Generation X ($p = 0.005 < 0.05$) and Generation Y ($p = 0.016 < 0.05$).

Two-way ANOVA indicated that vigor was significantly affected by generation ($F = 10.97$, $df = 3$, $p = 0.000 < 0.05$) and by perceived usefulness of mobile learning ($F = 34.66$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and perceived usefulness of mobile learning ($F = 16.04$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z perceived usefulness of mobile learning was more significantly associated with vigor than that of other generations: Baby Boomers ($p = 0.002 < 0.05$) and Generation X ($p = 0.001 < 0.05$).

Two-way ANOVA indicated that vigor was significantly affected by generation ($F = 8.64$, $df = 3$, $p = 0.000 < 0.05$) and by attitude to mobile learning ($F = 19.80$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and attitude to mobile learning ($F = 11.82$, $df = 3$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z attitude to mobile learning was more significantly associated with vigor than that of other generations: Baby Boomers ($p = 0.006 < 0.05$) and Generation X ($p = 0.003 < 0.05$).

Two-way ANOVA indicated that vigor was significantly affected by generation ($F = 5.52$, $df = 3$, $p = 0.001 < 0.05$) and by perceived ease of mobile learning use ($F = 12.48$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and perceived ease of mobile learning use ($F = 3.01$, $df = 4$, $p = 0.019 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z perceived ease of mobile learning use was more significantly associated with vigor than that of other generations: Baby Boomers ($p = 0.006 < 0.05$), Generation X ($p = 0.007 < 0.05$) and Generation Y ($p = 0.007 < 0.05$).

Two-way ANOVA indicated that vigor was significantly affected by generation ($F = 8.92$, $df = 3$, $p = 0.000 < 0.05$) and by intention for adoption of mobile learning ($F = 20.34$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and intention for adoption of mobile learning ($F = 9.52$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z intention for adoption of mobile learning was more significantly associated with vigor than that of other generations: Baby Boomers ($p = 0.004 < 0.05$) and Generation X ($p = 0.003 < 0.05$).

Two-way ANOVA indicated that vigor was significantly affected by generation ($F = 6.81$, $df = 3$, $p = 0.000 < 0.05$) and by innovativeness of mobile learning ($F = 8.51$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and innovativeness of mobile learning ($F = 2.99$, $df = 4$, $p = 0.020 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z innovativeness of mobile learning was more significantly associated with vigor than that of other generations: Baby Boomers ($p = 0.007 < 0.05$), Generation X ($p = 0.004 < 0.05$) and Generation Y ($p = 0.005 < 0.05$).

Two-way ANOVA indicated that vigor was significantly affected by generation ($F = 9.52$, $df = 3$, $p = 0.000 < 0.05$) and by self-efficacy to mobile learning ($F = 22.22$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and self-efficacy to mobile learning ($F = 9.03$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z self-efficacy to mobile learning was more significantly associated with vigor than that of other generations: Baby Boomers ($p = 0.004 < 0.05$) and Generation X ($p = 0.003 < 0.05$).

Based on two-way ANOVA tests results, one can assume that the hypothesis H2 (H2: Vigor (sub-dimension of work engagement) was significantly affected by generation and by mobile learning) is confirmed.

Two-way ANOVA indicated that dedication (sub-dimension of work engagement) was significantly affected by generation ($F = 6.65$, $df = 3$, $p = 0.000 < 0.05$) and by mobile learning ($F = 19.55$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and mobile learning ($F = 6.59$, $df = 3$, $p = 0.000 < 0.05$) (Tab. IV). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z mobile learning was more significantly associated with dedication than that of other generations: Baby Boomers ($p = 0.034 < 0.05$) and Generation X ($p = 0.012 < 0.05$).

Two-way ANOVA indicated that dedication was significantly affected by generation ($F = 11.22$, $df = 3$, $p = 0.000 < 0.05$) and by perceived usefulness of mobile learning ($F = 50.40$, $df = 2$, $p = 0.000 < 0.05$).

IV: Dedication of participants among different generations according to mobile learning (Tests of Between-Subjects Effects, ANOVA)

| Dependent Variable: Dedication | | | | | | |
|--------------------------------|-------------------------|-----|-------------|---------|------|---------------------|
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
| Corrected Model | 28.854 ^a | 8 | 3.607 | 7.974 | .000 | .223 |
| Intercept | 389.267 | 1 | 389.267 | 860.570 | .000 | .795 |
| Generation | 9.019 | 3 | 3.006 | 6.646 | .000 | .082 |
| Mobile learning | 17.690 | 2 | 8.845 | 19.554 | .000 | .150 |
| Generation * Mobile learning | 8.943 | 3 | 2.981 | 6.590 | .000 | .082 |
| Error | 100.419 | 222 | .452 | | | |
| Total | 618.000 | 231 | | | | |
| Corrected Total | 129.273 | 230 | | | | |

a. R Squared = .223 (Adjusted R Squared = .195)

There was a significant interaction between the generation and perceived usefulness of mobile learning ($F = 14.38$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z perceived usefulness of mobile learning was more significantly associated with dedication than that of other generations: Baby Boomers ($p = 0.006 < 0.05$) and Generation X ($p = 0.001 < 0.05$) and the Generation's Y perceived usefulness of mobile learning was more significantly associated with dedication than that of Generation X ($p = 0.021 < 0.05$).

Two-way ANOVA indicated that dedication was significantly affected by generation ($F = 8.97$, $df = 3$, $p = 0.000 < 0.05$) and by attitude to mobile learning ($F = 33.1$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and attitude to mobile learning ($F = 33.1$, $df = 3$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z attitude to mobile learning was more significantly associated with dedication than that of other generations: Baby Boomers ($p = 0.023 < 0.05$) and Generation X ($p = 0.004 < 0.05$).

Two-way ANOVA indicated that dedication was significantly affected by generation ($F = 4.48$, $df = 3$, $p = 0.004 < 0.05$) and by perceived ease of mobile learning use ($F = 14.35$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and perceived ease of mobile learning use ($F = 4.15$, $df = 4$, $p = 0.003 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z perceived ease of mobile learning use was more significantly associated with dedication than that of other generations: Baby Boomers ($p = 0.017 < 0.05$) and Generation X ($p = 0.031 < 0.05$).

Two-way ANOVA indicated that dedication was significantly affected by generation ($F = 8.46$, $df = 3$,

$p = 0.000 < 0.05$) and by intention for adoption of mobile learning ($F = 31.15$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and intention for adoption of mobile learning ($F = 6.06$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z intention for adoption of mobile learning was more significantly associated with dedication than that of other generations: Baby Boomers ($p = 0.014 < 0.05$) and Generation X ($p = 0.008 < 0.05$).

Two-way ANOVA indicated that dedication was significantly affected by generation ($F = 6.52$, $df = 3$, $p = 0.000 < 0.05$) and by innovativeness of mobile learning ($F = 12.85$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and innovativeness of mobile learning ($F = 2.94$, $df = 4$, $p = 0.021 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z innovativeness of mobile learning was more significantly associated with dedication than that of other generations: Baby Boomers ($p = 0.022 < 0.05$), Generation X ($p = 0.010 < 0.05$) and Generation Y ($p = 0.016 < 0.05$).

Two-way ANOVA indicated that dedication was significantly affected by generation ($F = 9.96$, $df = 3$, $p = 0.000 < 0.05$) and by self-efficacy to mobile learning ($F = 23.67$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and self-efficacy to mobile learning ($F = 13.72$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z self-efficacy to mobile learning was more significantly associated with dedication than that of other generations: Baby Boomers ($p = 0.012 < 0.05$) and Generation X ($p = 0.010 < 0.05$).

Based on two-way ANOVA tests results, one can assume that the hypothesis H3 (H3: Dedication (sub-

V: Absorption of participants among different generations according to mobile learning (Tests of Between-Subjects Effects, ANOVA)

| Dependent Variable: Absorption | | | | | | |
|--------------------------------|-------------------------|-----|-------------|---------|------|---------------------|
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
| Corrected Model | 39.374a | 8 | 4.922 | 10.948 | .000 | .283 |
| Intercept | 400.838 | 1 | 400.838 | 891.613 | .000 | .801 |
| Generation | 18.836 | 3 | 6.279 | 13.966 | .000 | .159 |
| Mobile learning | 14.588 | 2 | 7.294 | 16.224 | .000 | .128 |
| Generation * Mobile learning | 14.436 | 3 | 4.812 | 10.704 | .000 | .126 |
| Error | 99.803 | 222 | .450 | | | |
| Total | 625.000 | 231 | | | | |
| Corrected Total | 139.177 | 230 | | | | |

a. R Squared = .283 (Adjusted R Squared = .257)

dimension of work engagement) was significantly affected by generation and by mobile learning) is confirmed.

Two-way ANOVA indicated that absorption (sub-dimension of work engagement) was significantly affected by generation ($F = 13.97$, $df = 3$, $p = 0.000 < 0.05$) and by mobile learning ($F = 16.22$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and mobile learning ($F = 10.70$, $df = 3$, $p = 0.000 < 0.05$) (Tab. V). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z mobile learning was more significantly associated with absorption than that of other generations: Baby Boomers ($p = 0.000 < 0.05$), Generation X ($p = 0.000 < 0.05$) and Generation Y ($p = 0.000 < 0.05$).

Two-way ANOVA indicated that absorption was significantly affected by generation ($F = 22.43$, $df = 3$, $p = 0.000 < 0.05$) and by perceived usefulness of mobile learning ($F = 44.50$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and perceived usefulness of mobile learning ($F = 19.31$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z perceived usefulness of mobile learning was more significantly associated with absorption than that of other generations: Baby Boomers ($p = 0.000 < 0.05$), Generation X ($p = 0.000 < 0.05$) and Generation Y ($p = 0.011 < 0.05$).

Two-way ANOVA indicated that absorption was significantly affected by generation ($F = 16.87$, $df = 3$, $p = 0.000 < 0.05$) and by attitude to mobile learning ($F = 18.06$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and attitude to mobile learning ($F = 21.1$, $df = 3$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z attitude to mobile learning was more significantly associated

with absorption than that of other generations: Baby Boomers ($p = 0.000 < 0.05$), Generation X ($p = 0.000 < 0.05$) and Generation Y ($p = 0.000 < 0.05$).

Two-way ANOVA indicated that absorption was significantly affected by generation ($F = 10.47$, $df = 3$, $p = 0.000 < 0.05$) and by perceived ease of mobile learning use ($F = 11.11$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and perceived ease of mobile learning use ($F = 6.13$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z perceived ease of mobile learning use was more significantly associated with absorption than that of other generations: Baby Boomers ($p = 0.000 < 0.05$), Generation X ($p = 0.000 < 0.05$) and Generation Y ($p = 0.000 < 0.05$).

Two-way ANOVA indicated that absorption was significantly affected by generation ($F = 17.26$, $df = 3$, $p = 0.000 < 0.05$) and by intention for adoption of mobile learning ($F = 25.19$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and intention for adoption of mobile learning ($F = 10.71$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z intention for adoption of mobile learning was more significantly associated with absorption than that of other generations: Baby Boomers ($p = 0.000 < 0.05$), Generation X ($p = 0.000 < 0.05$) and Generation Y ($p = 0.000 < 0.05$).

Two-way ANOVA indicated that absorption was significantly affected by generation ($F = 12.54$, $df = 3$, $p = 0.000 < 0.05$) and by innovativeness of mobile learning ($F = 10.70$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and innovativeness of mobile learning ($F = 2.54$, $df = 4$, $p = 0.041 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z innovativeness of mobile learning was more

significantly associated with absorption than that of other generations: Baby Boomers ($p = 0.000 < 0.05$), Generation X ($p = 0.000 < 0.05$) and Generation Y ($p = 0.000 < 0.05$).

Two-way ANOVA indicated that absorption was significantly affected by generation ($F = 18.30$, $df = 3$, $p = 0.000 < 0.05$) and by self-efficacy to mobile learning ($F = 27.86$, $df = 2$, $p = 0.000 < 0.05$). There was a significant interaction between the generation and self-efficacy to mobile learning ($F = 9.45$, $df = 4$, $p = 0.000 < 0.05$). Two-way ANOVA with Bonferroni corrected pairwise comparisons revealed that overall, the Generation's Z self-efficacy to mobile learning was more significantly associated with absorption than that of other generations: Baby Boomers ($p = 0.000 < 0.05$), Generation X ($p = 0.000 < 0.05$) and Generation Y ($p = 0.000 < 0.05$).

Based on two-way ANOVA tests results, one can assume that the hypothesis H4 (H4: Absorption (sub-dimension of work engagement) was significantly affected by generation and by mobile learning) is confirmed.

It was identified in the research that mobile learning of Generation Z (perceived usefulness of mobile learning, attitude to mobile learning, perceived ease of mobile learning use, intention for adoption of mobile learning and self-efficacy to mobile learning) was more significantly associated with work engagement than that of the Baby Boomers' Generation and Generation X. The perceived innovativeness of mobile learning of Generation Z was more significantly associated with work engagement than that of the Baby Boomers' Generation, Generation X and Generation Y. This confirms the views of a number of scholars that mobile learning and other IT tools (Kadirire, 2009; Jaschke, 2014; Hu, Liu, Li and Zhai, 2015;

Baccari, Mendes, Nicolle, Soualah-Alila and Neji, 2016; Engelmann and Schwabe, 2018) used in the workplace alter communication among employees and the learning process in the workplace, etc. Due to the fact that Generation Z has been using mobile phones and other IT technologies since their early days, they are more comfortable using technology for communication or for learning "even when the use of technology is not appropriate" (Drolet and Morris, 2000; Schroth, 2019), and Generation Z in general has shown "to be more prone to the use of different mobile technologies, far above the other generations" (Lebioda, Hahn and Martins, 2019, p. 25738).

The obtained research results show that Generation Z in the workplace significantly differs from other generations. This also confirms the significant differences of Generation Z in comparison to other past generations, as highlighted in scientific literature, e.g. Schroth (2019) indicates that "managers face special challenges with the new generation of employees because Generation Z is not as prepared for the realities of the workplace as past generations" (p. 10).

Under the guidance of the lifelong learning idea, mobile learning refers to the use of modern mobile devices (such as personal digital assistants (PDAs), cell phones, smart phones, notebooks (NBs), or tablet personal computers (PCs) (Cheng, 2015)) for distance learning. It has characteristics of mobility, personalisation, interactivity, portability, etc. (Hu, Liu, Li and Zhai, 2015, p. 99), so it can meet the actual demands of the Generation Z training in the workplace. Summarising the results of the study, one can draw a conclusion that greater focus on Generation Z mobile learning in the workplace would increase their work engagement.

CONCLUSION

This paper tries to determine whether there is a relationship between work engagement and mobile learning and whether there are significant variances between work engagement and mobile learning among different generational cohorts.

Firstly, one can assume that the Baby Boomers, Generation X and Generation Y are more engaged in the workplace (highly engaged) than Generation Z (moderately engaged) in the workplace. The Generation Z is more prone to using mobile learning in the workplace than Generation X and Generation Y; the Baby Boomers are least prone to using mobile learning than other generations in the workplace.

Secondly, there are significant differences in work engagement by different generations and mobile learning. Two-way ANOVA indicated that work engagement was significantly affected by generation and by all sub-dimensions of mobile learning: by perceived usefulness of mobile learning, by attitude to mobile learning, by perceived ease of mobile learning use, by intention for adoption of mobile learning, by innovativeness of mobile learning and by self-efficacy to mobile learning. There was a significant interaction between the generation and all sub-dimensions of mobile learning: perceived usefulness of mobile learning, attitude to mobile learning, perceived ease of mobile learning use, intention for adoption of mobile learning, innovativeness of mobile learning and self-efficacy to mobile learning. The Generation's Z mobile learning (perceived usefulness of mobile learning, attitude to mobile learning, perceived ease of mobile learning use, intention for adoption of mobile learning and self-efficacy to mobile learning) was more significantly associated with work engagement than that of Baby Boomers and Generation X. The Generation's Z perceived

innovativeness of mobile learning was more significantly associated with work engagement than that of Baby Boomers, Generation X and Generation Y.

Finally, the sub-dimensions of work engagement – vigor, dedication and absorption – were significantly affected by generation and by mobile learning. This research showed significant differences between the Generations Z and other generations: Baby Boomers, Generation X and Generation Y. One can assume that Generation Z mobile learning in the workplace would increase their work engagement.

Practical application of the research findings is possible with some limitations. Since the research has been conducted in Lithuanian, EU, organisations that meet two criteria: use mobile learning in the workplace and employ representatives of four generations, one of the conclusions (i.e. to focus more on Generation Z mobile learning in the workplace what would increase their work engagement), and the recommendation to focus more on Generation's Z mobile learning in the workplace in order to increase work engagement of this generation, are practically applicable namely in this type of organisations. According to Schaufeli (2017), Lithuania is a country with a high work engagement level, thus, practical application of the findings is more applicable to countries with the same high work engagement level. As it was mentioned in the scientific literature analysis, Generation Z is only now entering the labour market (Wheatley and Hibbler-Britt, 2019), and therefore, so far the number of representatives of this generation being engaged in work, and at the same time participating in the research, has been rather low, since the majority of Generation Z are still learning/studying. Hence, although work engagement of Generation Z employees has been identified as the lowest, i.e. the representatives of Generation Z are the least engaged in work in comparison to other generations, such obtained results may be due to the factors other than just mobile learning. Therefore, work engagement of Generation Z employees is a possible future research direction.

As for future research directions, a few directions can be identified. Work engagement is seen as one of the generational differences existing in the labour market (Bai and Liu, 2018); however, comprehensive and systematic research to determine the level of work engagement, to identify the determining factors and possibilities of its increase, has been conducted neither in Lithuania nor in the EU. This article analyses the relationship between work engagement of different generations and mobile learning, while other factors that determine work engagement of employees belonging to different generations have not been researched yet. Therefore, one of the possible future research directions could be the analysis of work engagement and its determining factors among the employees of different generations currently existing in the labour market. As it was mentioned above, according to Schaufeli (2017), the levels of engagement differ across Europe, and this opens yet another possible research direction to compare work engagement of different generations' employees in different countries, exploring possibilities of its increase. The research has shown that there are significant differences in work engagement by different generations and by mobile learning, and that Generation's Z mobile learning in the workplace would increase their work engagement, however, research on specific mobile learning tools and their influence on work engagement of employees of different generations, or at least of the employees of Generation Z, has not been carried out, and therefore, this direction is also available as a future research direction.

REFERENCES

- AL-EMRAN, M., MEZHUYEV, V. and KAMALUDIN, A. 2018. Technology Acceptance Model in M-learning context: A systematic review. *Computers & Education*, 125: 389–412.
- ALSOP, R. 2008. *The trophy kids grow up: How the millennial generation is shaking up the workplace*. John Wiley & Sons.
- BACCARI, S., MENDES, F., NICOLLE, C., SOUALAH-ALILA, F. and NEJI, M. 2016. Comparative Study of the Mobile Learning Architectures. *E-Learning, E-Education, and Online Training*, 180(1): 191–200.
- BAI, J. and LIU, J. 2018. A Study on the Influence of Career Growth on Work Engagement among New Generation Employees. *Open Journal of Business and Management*, 6(2): 300.
- BAKKER, A. B. and ALBRECHT, S. 2018. Work engagement: current trends. *Career Development International*, 23(1): 4–11.
- BAKKER, A. B. and SCHAUFELI, W. B. 2008. Positive organizational behavior: Engaged employees in flourishing organizations. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 29(2): 147–154.
- BECTON, J. B., WALKER, H. J. and JONES-FARMER, A. 2014. Generational differences in workplace behavior. *Journal of Applied Social Psychology*, 44(3): 175–189.
- BENCsik, A., HORVATH-CSIKOS, G. and JUHASZ, T. 2016. Y and Z Generations at Workplaces. *Journal of Competitiveness*, 8(3): 90–106.

- BOHL, J. C. 2008. Generation X and Y in law school: Practical strategies for teaching the MTV/Google generation. *Loy. L. Rev.*, 54: 775.
- BROWN, B. and CHALMERS, M. 2003. Tourism and mobile technology. In: *ECSCW 2003. Proceedings of the Eighth European Conference on Computer Supported Cooperative Work 14–18 September 2003, Helsinki, Finland*. Dordrecht: Springer, pp. 335–354.
- BUCHANAN, L. 2004. The things they do for love. *Harvard Business Review*, 82(12): 19–20.
- CHAWLA, D., DOKADIA, A. and RAI, S. 2017. Multigenerational differences in career preferences, reward preferences and work engagement among Indian employees. *Global Business Review*, 18(1): 181–197.
- CHENG, Y. M. 2015. Towards an understanding of the factors affecting m-learning acceptance: Roles of technological characteristics and compatibility. *Asia Pacific Management Review*, 20(3): 109–119.
- COETZEE, M., FERREIRA, N. and SHUNMUGUM, C. 2017. Psychological career resources, career adaptability and work engagement of generational cohorts in the media industry. *SA Journal of Human Resource Management*, 15(8): a868.
- COGIN, J. 2012. Are generational differences in work values fact or fiction? Multi-country evidence and implications. *The International Journal of Human Resource Management*, 23(11): 2268–2294.
- DAVIS, F. D. 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Systems. *MIS Quarterly*, 13(3): 319–339.
- DROLET, A. L. and MORRIS, M. W. 2000. Rapport in conflict resolution: Accounting for how face-to-face contact fosters mutual cooperation in mixed-motive conflicts. *Journal of Experimental Social Psychology*, 36(1): 26–50.
- EUROSTAT. 2018. Educational attainment statistics. *Eurostat*. Available: https://ec.europa.eu/eurostat/statistics-explained/index.php/Educational_attainment_statistics [Accessed: 2019, August 30].
- ENGELMANN, A. and SCHWABE, G. 2018. Enabling Workers to Enter Industry 4.0: A Layered Mobile Learning Architecture. In: *Proceedings of the 51st Hawaii International Conference on System Sciences*, pp. 23–32.
- FARRELL, L. and HURT, A. C. 2014. Training the Millennial Generation: Implications for Organizational Climate. *Journal of Organizational Learning & Leadership*, 12(1): 1–14.
- FATIMA, J. K., GHANFOROUSH, P., KHAN, M. and MASICO, R. D. 2017. Role of innovativeness and self-efficacy in tourism m-learning. *Tourism Review*, 72(3): 344–355.
- FLEMING, J. H. and ASPLUND, J. 2007. *Human sigma*. New York: Gallup.
- GUAN, X. and FRENKEL, S. 2018. How HR practice, work engagement and job crafting influence employee performance. *Chinese Management Studies*, 12(3): 591–607.
- HILLMAN, D. R. 2014. Understanding multigenerational work-value conflict resolution. *Journal of Workplace Behavioral Health*, 29(3): 240–257.
- HOOLE, C. and BONNEMA, J. 2015. Work engagement and meaningful work across generational cohorts. *SA Journal of Human Resource Management*, 13(1): 1–11.
- HOWE, N. and STRAUSS, W. 2000. *Millennials rising: The next great generation*. New York, USA: Vintage Books.
- HU, M., LIU, Q., LI, H. and ZHAI, L. 2015. Research on the Application of Mobile Learning System for the New Generation of Migrant Workers. In: *Educational Innovation through Technology (EITT)*. 2015 International Conference (IEEE), pp. 99–102.
- HU, S. N. and WANG, Y. 2014. Concept, Measurements, Antecedents and Consequences of Work Engagement. *Advances in Psychological Science*, 22: 1975–1984.
- JAMES, J. B., MCKECHNIE, S. and SWANBERG, J. 2011. Predicting employee engagement in an age-diverse retail workforce. *Journal of Organizational Behavior*, 32(2): 173–196.
- JASCHKE, S. 2014. Mobile learning applications for technical vocational and engineering education: The use of competence snippets in laboratory courses and industry 4.0. In: *2014 International Conference on Interactive Collaborative Learning (ICL)*. Dubai, United Arab Emirates. IEEE, pp. 605–608.
- KADIRIRE, J. 2009. Mobile Learning DeMystified. In: GUY, R. (Ed.). *The Evolution of Mobile Teaching and Learning*. California, USA: Informing Science Press.
- KENNY, R. F., VAN NESTE-KENNY, J. M., BURTON, P. A., PARK, C. L. and QAYYUM, A. 2012. Using self-efficacy to assess the readiness of nursing educators and students for mobile learning. *The International Review of Research in Open and Distributed Learning*, 13(3): 277–296.
- KESKIN, N. O. and METCALF, D. 2011. The current perspectives, theories and practices of mobile learning. *Turkish Online Journal of Educational Technology-TOJET*, 10(2): 202–208.
- KHADIM, B. 2018. Mobile Learning And Education In The Digital Age. *eLearning Industry*. Available online: <https://elearningindustry.com/mobile-learning-education-digital-age> [Accessed: 2018, April 10].

- KILIS, S. 2013. Impacts of Mobile Learning in Motivation, Engagement and Achievement of Learners: Review of Literature. *Gaziantep University Journal of Social Sciences*, 12(2): 375–383.
- KUPPERSCHMIDT, B. R. 2000. Multigeneration employees: strategies for effective management. *The health care manager*, 19(1): 65–76.
- LABERGE, M., TONDOUX, A., BLANCHARD, A., TREMBLAY, F. C. and GIRARD, M. M. 2018. Using mobile technology to support vocational training for adolescents with learning difficulties: a pilot study. *Occupational and Environmental Medicine*, 75(2): 837.
- LEBIODA, L., HAHN, I. S. and MARTINS, A. A. M. 2019. The influence of mobile technology usage behavior on perceived work performance improvement. *International Journal of Development Research*, 9(02): 25733–25738.
- LIAW, S. S., HUANG, H. M. and CHEN, G. D. 2007. Surveying instructor and learner attitudes toward e-learning. *Computers & Education*, 49(4): 1066–1080.
- LU, C., WANG, H., LU, J., DU, D. and BAKKER, A. B. 2014. Does work engagement increase person–job fit? The role of job crafting and job insecurity. *Journal of Vocational Behavior*, 84(2): 142–152.
- LYONS, S. T., SCHWEITZER, L. and NG, E. S. 2015. How have careers changed? An investigation of changing career patterns across four generations. *Journal of Managerial Psychology*, 30(1): 8–21.
- LYONS, S., DUXBURY, L. and HIGGINS, C. 2005. Are gender differences in basic human values a generational phenomenon? *Sex roles*, 53(9–10): 763–778.
- MACEY, W. H., SCHNEIDER, B., BARBERA, K. M. and YOUNG, S. A. 2011. *Employee engagement: Tools for analysis, practice, and competitive advantage*. John Wiley & Sons.
- MAHAT, J., AYUB, A. F. M. and LUAN, S. 2012. An assessment of students' mobile self-efficacy, readiness and personal innovativeness towards mobile learning in higher education in Malaysia. *Procedia-Social and Behavioral Sciences*, 64: 284–290.
- MCBAIN, R. 2007. The practice of engagement: Research into current employee engagement practice. *Strategic HR review*, 6(6): 16–19.
- MERCIAC, J. P., WOEHR, D. J. and BANISTER, C. 2010. Generational differences in work ethic: An examination of measurement equivalence across three cohorts. *Journal of Business and Psychology*, 25(2): 315–324.
- MICHAELSON, G. V. and HARDIN, M. 2010. Pairwise comparisons. In: SALKIND, N. J. (Ed.). *Encyclopedia of research design*. SAGE Publications, pp. 985–990.
- MOCKUS, L., DAWSON, H., EDEL-MALIZIA, S., SHAFFER, D., AN, J. and SWAGGERTY, A. 2011. The impact of mobile access on motivation: Distance education student perceptions. *World Campus Learning Design*, 4(5): 1–34.
- MONACO, M. and MARTIN, M. 2007. The millennial student: A new generation of learners. *Athletic Training Education Journal*, 2(2): 42–46.
- PARK, J. and GURSOY, D. 2012. Generation effects on work engagement among US hotel employees. *International Journal of Hospitality Management*, 31(4): 1195–1202.
- PARRY, E. 2018. Age and generational diversity in careers. In: BROADBRIDGE, A. M. and FIELDEN, S. L. (Eds.). *Research Handbook of Diversity and Careers*. USA: Edward Edgar Publishing.
- PARTRIDGE, H. and HALLAM, G. 2006. Educating the millennial generation for evidence based information practice. *Library Hi Tech*, 24(3): 400–419.
- PERRY, E. L., GOLOM, F. D., CATENACCI, L., INGRAHAM, M. E., COVAIS, E. M. and MOLINA, J. J. 2017. Talkin' 'bout your generation: the impact of applicant age and generation on hiring-related perceptions and outcomes. *Work, Aging and Retirement*, 3(2): 186–199.
- POULOVA, P., KLIMOVA, B., and PULKRABKOVÁ, D. 2019. Use of Mobile Devices – A Survey Study. In: *Smart Education and e-Learning 2019*. Singapore: Springer, pp. 303–312.
- REHMAN, M., ANJUM, M., ASKRI, F., KAMRAN, M. A. and ESICHAIKUL, V. 2016. Mobile learning adoption framework: An empirical investigation from learners perspective. *Journal of Quality and Technology Management*, 12(1): 1–43.
- SALANOVA, M. and SCHAUFELI, W. B. 2008. A cross-national study of work engagement as a mediator between job resources and proactive behavior. *The International Journal of Human Resource Management*, 19(1): 116–131.
- SAMPANGI, R. R., VISWANATH, V. V. and RAY A. A. 2010. Reaching the Unreached: A study on mobile learning in India. In: *Proc. Icel*, pp. 350–357.
- SÁNCHEZ-PRieto, J. C., OLMOS-MIGUELÁÑEZ, S. and GARCÍA-PEÑALVO, F. J. 2016. MLearning and pre-service teachers: an assessment of the behavioral intention using an expanded TAM model. *Computers in Human Behavior*, 55(1): 519–528.
- SCHAUFELI, W. 2017. Work engagement in Europe: Relations with national economy, governance and culture. *Organizational Dynamics*, 47(2): 99–106.

- SCHAUFELI, W. B. 2013. What is engagement? *Employee engagement in theory and practice*. London: Routledge.
- SCHAUFELI, W. B., BAKKER, A. B. and SALANOVA, M. 2006. The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and psychological measurement*, 66(4): 701–716.
- SCHAUFELI, W. B., SALANOVA, M., ROMA, V. G. and BAKKER, A. B. 2002. The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, 3: 71–92.
- SCHROTH, H. 2019. Are You Ready for Gen Z in the Workplace? *California Management Review*, 61(3): 5–18.
- SESSA, V. I., KABACOFF, R. I., DEAL, J. and BROWN, H. 2007. Generational differences in leader values and leadership behaviors. *The Psychologist-Manager Journal*, 10(1): 47–74.
- SHAW, S. and FAIRHURST, D. 2008. Engaging a new generation of graduates. *Education + Training*, 50(5): 366–378.
- SHUCK, B. and WOLLARD, K. 2010. Employee engagement and HRD: A seminal review of the foundations. *Human resource development review*, 9(1): 89–110.
- SIERING, M. and PAHLKE, I. 2013. Employee Empowerment with Computer Based Learning: An Empirical Investigation. In: *Wirtschaftsinformatik Proceedings*. 27th February–01st March 2013, Leipzig, Germany, pp. 846–861.
- SKIBA, D. J. and BARTON, A. J. 2006. Adapting your teaching to accommodate the net generation of learners. *Online Journal of Issues in Nursing*, 11(2): 15.
- SUKI, N. M. and SUKI, N. M. 2011. Using Mobile Device for Learning: From Students' Perspective. Online Submission. *US-China Education Review*, A1(1): 44–53.
- TAPSCOTT, D. 2010. *Growing Up Digital: The Rise of the Net Generation*. McGraw-Hill.
- TIMS, M., BAKKER, A. B. and DERKS, D. 2015. Job crafting and job performance: a longitudinal study. *European Journal of Work and Organizational Psychology*, 24(6): 914–928.
- TRINDER, J., MAGILL, J. and ROY, S. 2005. Expect the unexpected: Practicalities and problems of a PDA project. In: KUKULSKA-HULME, A. and TRAXLER, J. (Eds.). *Mobile Learning: A handbook for educators and trainers*. London: Routledge.
- TURNER, A. 2015. Generation Z: Technology and social interest. *The Journal of Individual Psychology*, 71(2): 103–113.
- TWENGE, J. M. 2010. A review of the empirical evidence on generational differences in work attitudes. *Journal of Business and Psychology*, 25(2): 201–210.
- TWENGE, J. M., CAMPBELL, S. M., HOFFMAN, B. J. and LANCE, C. E. 2010. Generational differences in work values: Leisure and extrinsic values increasing, social and intrinsic values decreasing. *Journal of management*, 36(5): 1117–1142.
- UNESCO. 2016. *International Standard Classification of Education: ISCED 2001*. Available at: <http://www.uis.unesco.org/Library/Documents/isced97-en.pdf> [Accessed: 2018, June 23].
- URICK, M. J., HOLLENSBE, E. C., MASTERTON, S. S. and LYONS, S. T. 2016. Understanding and managing intergenerational conflict: An examination of influences and strategies. *Work, Aging and Retirement*, 3(2): 166–185.
- WAGNER, R. and HARTER, J. K. 2006. *The great elements of managing*. Washington, DC: The Gallup Organization.
- WANG, M. 2018. Emerging Technologies for Workplace Learning. In: *E-Learning in the Workplace*. Cham: Springer.
- WELCH, M. 2011. The evolution of the employee engagement concept: communication implications. *Corporate Communications: An International Journal*, 16(4): 328–346.
- WEY SMOLA, K. and SUTTON, C. D. 2002. Generational differences: Revisiting generational work values for the new millennium. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 23(4): 363–382.
- WHEATLEY, A. C. and HIBBLER-BRITT, L. M. 2019. The Long Tail of Generation Z and the Future of a Freelance Economy. In: *Advances in the Technology of Managing People: Contemporary Issues in Business*. Emerald Publishing Limited, 2019, pp. 83–92.
- WILSON, M. and GERBER, L. E. 2008. How generational theory can improve teaching: Strategies for working with the “Millennials”. *Currents in teaching and learning*, 1(1): 29–44.
- WONG, M., GARDINER, E., LANG, W. and COULON, L. 2008. Generational differences in personality and motivation: do they exist and what are the implications for the workplace? *Journal of Managerial Psychology*, 23(8): 878–890.
- YUSOF, A. A., MOKHTAR, N. F. and SET, K. 2019. Cost, security and features influencing baby boomers behavioral intention on adopting Whatsapp application. *International Journal of Accounting*, 4(18): 67–77.

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