Work Engagement and Burnout Prevention through the Intervention of Learning Java Programming Skills to Blue-Color Professionals

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Abstract

The research features Java programming skills interventions introduced to an experimental group of shop assistants in Russia (years 2020-2021) as a part of the work engagement enhancement framework. The interventions' cycle included 4 weeks, featuring videos describing Java basics. The results are promising since the participants reported brief manageable stresses, the development of positive social bonds, the enhancement of perceived social support, and the engagement in help-seeking behaviors. The rate of work engagement was measured according to Utrecht Work Engagement Scale. The results were validated with the statistical method of Rosenbaum Q criteria. The proposed interventions outline focuses on seven areas: 1) the attitude of society to learning interventions featuring an unknown subject field; 2) the formation of the learning environment; 3) psychological diversity of participants; 4) work engagement; 5) planning and evaluation of results; 6) social relationships; 7) personal growth and professional development. It is a common belief that a smaller workload, shorter working hours, or bigger financial rewards can solve burnout problems and increase work engagement. We propose a different approach which is a careful intervention of new studying programs as a work engagement enhancement strategy, as well as an anti-burnout method.

Keywords

Java Programming Skills, Work Engagement, Intervention, Burnout, Positive Psychology.

Introduction

Work engagement is one of the key factors which determines employees' loyalty and job satisfaction. Key aspects related to work engagement include such important factors as a conscious dedication to work responsibilities, a strong commitment to task-fulfillment, personal happiness, the sense of self-protection, alongside general fitness and energy. Human resources managers register higher achievement rates among engaged workers, as well as reduced employees' exodus. Work engagement is directly related to burnout syndrome which is marked by such symptoms as lack of concentration, headaches, anxiety, muscle tension, apathy, fatigue, frustration, and psychosomatic illnesses. Burnout, leading to demotivation, is a key problem for professionals in different areas of a modern economy. Our studying field is work engagement enhancement strategies among shop assistants during the COVID-19 pandemic in Russia (years 2020-2021). An increased market load in certain sectors became a reality for the global business community. Therefore, it is likely that the paper is of importance for shop HR managers all over the world.

It is a common belief that a smaller workload, shorter working hours, or bigger financial rewards can solve burnout problems and increase work engagement. We propose a different approach which is a careful intervention of new studying programs as a work engagement enhancement strategy, as well as an anti-burnout method. Interventions are an integral part of present-day human resources management. Many professional education interventions focus on key areas directly related to the craft field of employees. Our research proposes that educational interventions directed at obscure professional fields are more likely to enhance help-seeking behaviors, develop social connections, increase perceived social support. Our strategy is to offer basic education in the area of Java programming skills to shop assistants. We proceed from the assumption that the synergy of programming languages' knowledge with physical labor jobs may build a better work engagement even for blue-collar jobs, leading to a more varied professional activity. This combination will allow developing a sense of mental progress and the acceptance of care provided by employers. In our opinion, professional burnout at work can be overcome by a change of activity, and not by its partial suspension.

Professionals from any field should take regular mind-growing courses. The content of such courses often focuses on the listing of electronic data resources, the collection of legislation

formulas, or current world market trends. We are convinced that such courses lack an educational challenge that stimulates the development of the cognitive potential of people from the mass-market sector. Upgrading programs, the content of which is easy to predict, do not allow participants to make unexpected discoveries about their hidden possibilities. Programming development interventions are designed to reveal the facets of individual personality that are not obvious in the course of the usual everyday routine of the selling process.

Modern programming is no longer a professional hobby of a small elite group of people with special abilities. On the whole, it should be noted that the high level of salaries for programmers and brilliant career prospects are the strongest motivational base for the influx of new specialists. Salary interest in Java programming does not subside, since programs written in this language are supported by all devices and enjoy a tremendous market demand. Java developers design applications for Android, they also offer desk-top applications and online banking products. The modern Java ecosystem is well-developed, it adapts to new conditions, the updated version of Java Development Kit is released every six months. However, it should be noted that along with the interest in Java, there is also a considerable outflow of young personnel from this language, whose expectations are not met by the level of complexity of the work. We believe that active mastery of Java basics can become a good skill. Consequently, we believe that the interaction of Java instructors and shop assistants can be mutually beneficial since the representatives of these two communities can help perceive different crafts and lifestyles.

Hypothesis 1 of the research is that short interventions may be a successful work engagement strategy for people doing physical labor. This experience will be associated with an improvement in their mental background and will contribute to a decrease in professional burnout. **Hypothesis 2** describes the scope effect produced by the interventions introduced in the research. Interventions that offer the knowledge not covered in previous education experience can ignite bigger emotional arousal, including short-term stress. **Hypothesis 3** of the study is that the interventions result in a "growth" mindset, malleable personality. A simple acceptance of the fact may be a further motivation reason for the participants.

Literature Review

There is a growing body of literature describing work engagement related to motivation. There are many factors that influence vigor and dedication to work. Age-factor determines key engagement patterns. R. Kanfer et al. (2013) highlighted key work goals in later

adulthood, among which a job challenge and mental development come first. J.C. Timmons et al. (2011) stressed the factor of time in job motivation. The significance of psychological work environment is demonstrated in the research by S. Thorsen et al. (2012), A.C. St-Louis et al. (2021), Z. Zimanyi (2021). W. C. Murray et al. (2021) highlighted the hidden capacities of employees and the potential of their empowerment. The important factor to general well-being, including work engagement, is meaning in life which mediates stressful situations, according to F. Jia et al. (2021). K. Muratshina (2017), N. Zavyalova, E.M. Akhmetshin a part of work engagement enhancement framework. (2018), Y. M. Wang et al. (2021) stressed the importance of psychological safety among people with different cultural background. Based on these assumptions we propose an idea that Java interventions may be meaningful, add to a positive psychological environment among colleagues, as well as their psychological safety, and empower blue-collar workers with new skills conducive to their mind rising.

Stresses, job burnout syndromes, financial strains directly relate to work engagement levels. To combat these negative features it is important to monitor mental health which was proved by W.K. Hou *et al.* (2021). Depressive symptoms need careful attention and new ways of therapy, including fresh earlier unknown activities, according to X. Xie et al. (2021). We believe that Java code basics interventions offer enough novelty which may be instrumental for preserving mental health.
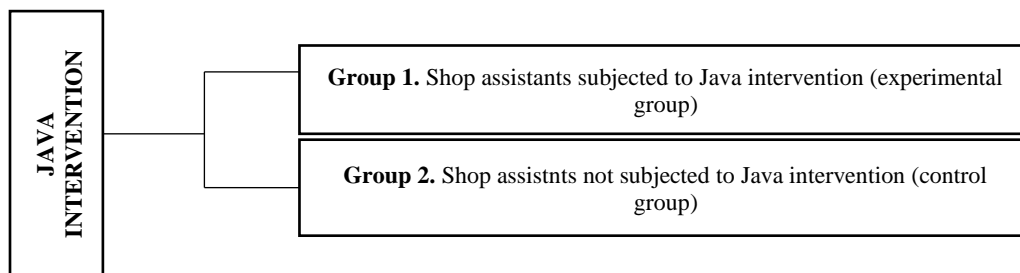
O'Rourke et al. (2021) described effective psychometric qualities of the English coping scales of stress. For our study, two psychometric qualities proved to be essentially important, i.e. *positive thinking* and *active coping*. We believe that Java programming interventions enhance these qualities. X. Jiang et al. (2021) highlight that "emotion and cognitive engagement mediated…psychological withdrawal", consequently, we assume that through their cognitive engagement Java interventions also mediate psychological withdrawal.

Interventions are very important elements of positive psychology. N.N. Wijayatunga et al. (2021) described the importance of video interventions for modern communities. However, interventions are not always effective. Nevertheless, our research is focused entirely on a positive assumption of interventions' impact. R. Jones (2021) highlighted the interplay of greenspace interventions, stress, and cortisol. For our research the notion of stress is central since many participants registered brief stress while Java development interventions. S. Gorbeña et al. (2021) paid scientific attention to the interconnection of positive intervention and mental health which is crucial to understanding the impact of our research.
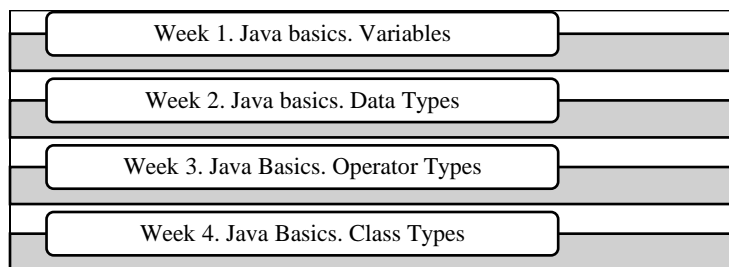
Shop assistants may doubt the advisability of acquiring new computer programming competencies. The most obvious advantage, in our opinion, is the improvement of the general erudition and image component of a shop assistant arising from the proposed project. Among additional positive outputs, one should highlight the effect of novelty, mastering the basics of skills and abilities in demand on the labor market. For the growth of professional skills of shop assistants, skills in working with datasets can be useful, the essence of which is presented in great detail in the set of basic knowledge of Java. Of course, for many shop assistants, learning Java is a new frontier, a challenge with unclear goals. However, it should be argued that, based on the approaches of modern positive psychology, training in new skills that are in demand on the labor market helps to generally increase the emotional component of not only professional duties but also personal outlook. Successful mastery of advanced skills has a positive effect on personal projects: personal strategies for people with disabilities (Raley, Shogren, Cole, 2021); personal group programs (Enrique, Bretón-López, Molinari et al., 2021); personal development (Kai Liao, Wu, Dao, Ngoc Luu, 2021); personal consumption (Tomșa, Romonți-Maniu, Scridon, 2021).

Method and Methodology

20 shop assistants aged 20-35 were recruited to take part in the intervention cycle, which lasted 4 weeks. The age group covers the most widely-spread age span in Russia. We asked for the written consent of each participant to take part in the experiment. We designed 2 groups of participants (Fig.1).

JAVA INTERVENTION

Group 1. Shop assistants subjected to Java intervention (experimental group)

Group 2. Shop assistnts not subjected to Java intervention (control group)

Fig. 1 Flow chart of research groups

Week 1. Java basics. Variables

Week 2. Java basics. Data Types

Week 3. Java Basics. Operator Types

Week 4. Java Basics. Class Types

Fig. 2 Flow chart of Java intervention program (Group 1)

Each week on Monday students from Group 1 received 30-minutes videos describing a new topic (Fig.2). Each intervention was defined as a sequence of ideas that offer instructional content featuring Java basics that result in thoughts and ideas. These thoughts and ideas are neurologically based. Neurological activities are not fixed, they change in time. Positive responses or brief stresses to interventions result in better work engagement. Better work engagement leads to a malleable personality with increased neuroplasticity.

Results

To more fully represent the motivational structure of shop assistants when getting acquainted with the basics of programming in Java we introduced written assignments where participants described their themes (Table 1).

Table 1 Themes actualized in written assignments provided after interventions

| Theme	Description	Example
A positive modification	• Our traits of character are not fixed, they may be changed for the better.	• "Having free time, I wanted to at least increase the level of understanding of some things in the field of programming (just for myself and my own self-development), since this topic is very pleasant, tempting and interesting. So, among other things, it is also very useful. After all, understanding how a certain mechanism works allow you to do the necessary work much faster and better."
A new field of professional interest	• New fields of work are interesting. Interest results in motivation to grow further.	• "Java is an interesting area of my future work, I hope. Shop assistant career is not my life-long ambition. Probably, I will go on with Java."
Self-reliance, determination to work independently	• Determination to solve problems without other people's help. We can irradicate problems without other people's assistance	• "When I have problems writing Java codes, I keep trying to fix bugs myself"
The development of social bonds, the engagement in help-seeking behaviors	• It is acceptable to ask other people to help, if you cannot find a solution individually	• "When I have problems writing Java codes, I look for help from my teacher"
A brief manageable stress	• It is natural to develop emotions while doing a new task. These emotions may be negative but we accept them, make an attempt to understand them	• "When I have problems writing Java codes, I get anxious but I like this anxiety"
A dislike for things that are not understandable. An explicit preference for traditional things	• A negative reaction to a new field leads to a better appreciation of accustomed professional duties.	• "I cannot understand Java. I do not need it in my job. I want to do market sales without any additional training"
Acceptance of progress, gratitude	• The sense of achievement and gratitude for goal achievement is a positive emotional reaction. It may bring further positive outcomes.	• " I can understand the content of the basic varieties of Java code and feel joy, a burst of energy". • "With the right approach to learning, self-expanding horizons, and timely homework, you can achieve a result even without special basic knowledge"

The processing of the survey data revealed an increased level of satisfaction with the learning process among shop assistants. This synergy of knowledge contributes to the multilateral development of a professional personality, which leads to an overall improvement in the quality of life. The issues of interdisciplinary synergy have long been at the center of attention of modern human resources management. Scientists pay great attention to areas related to understanding the interaction of closely related fields. Within the framework of the proposed approach, an attempt is made to synergize non-closely related disciplines. The attempted synergy of the two directions is due to the popularity of both crafts, however, they represent opposite spheres, i.e. blue-color jobs vs white-color jobs. Today Java programming is a necessary source of commands and methods to accomplish various goals. Successful mastering of programmer competencies is due to knowledge of basic commands in English. Consequently, learning Java may lead to an interest in mastering English-language competencies (Fig. 3).
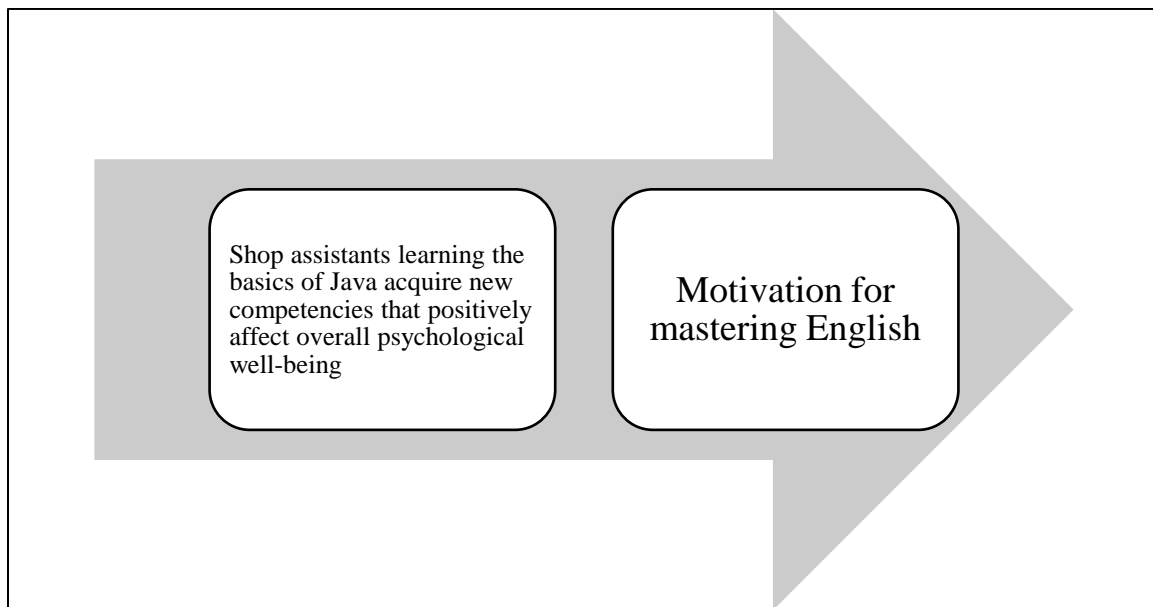
Fig. 3 Additional competencies actualized during interventions

Even small achievements in Java programming provide a burst of positive emotions among students who decided to print out the phrase "Life is good!" (Fig.4).
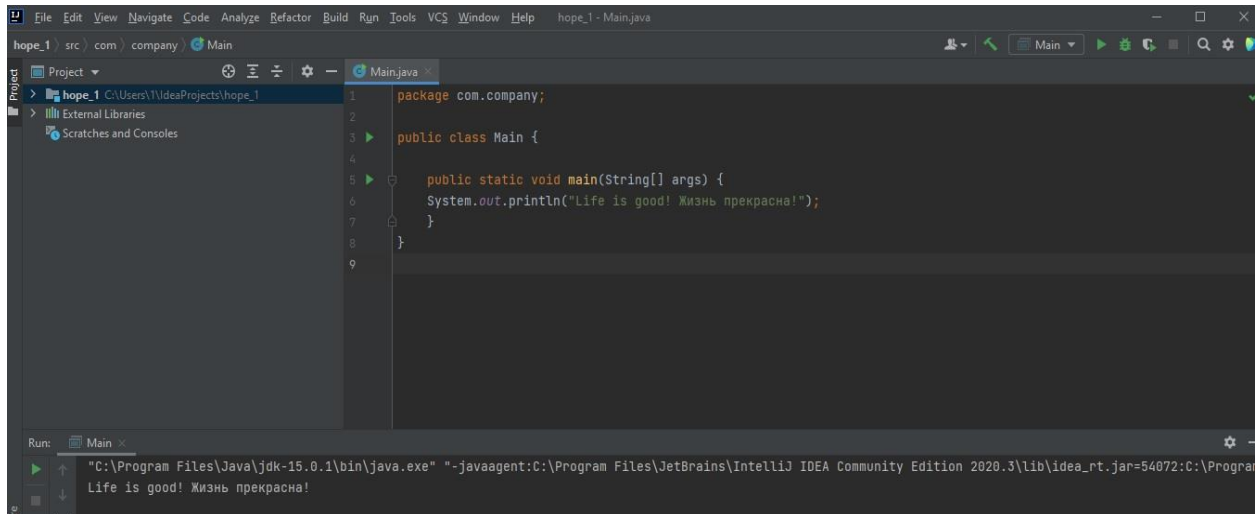
Fig. 4 Java code compiled by one of the participants

To check the levels of social engagement we applied Utrecht Work Engagement Scale (UWES) to measure general work engagement irrelevant to specific parameters of vigor, dedication, absorption (Table 2). The participants were evenly distributed into two groups: experimental and control, with 10 persons in each group. We assessed their answers according to the statistical method of Rosenbaum Q criteria. We calculated the arithmetic mean for each of the 17 UWES questions.

Table 2 The arithmetic means in control and experimental groups of replies to 17 questions of Utrecht Work Engagement Scale (UWES)

	The arithmetic mean in the control group (sample 2)	The arithmetic mean in the experimental group (sample 1)
At my work, I feel bursting with energy	5,2	5,8
I find the work that I do full of meaning and purpose	4,7	5,2
Time flies when I'm working	4,2	5,4
At my job, I feel strong and vigorous	3,8	4,2
I am enthusiastic about my job	3,6	3,9
When I am working, I forget everything else around me	3,2	4,2
My job inspires me	4,3	5,5
When I get up in the morning, I feel like going to work	4,2	4,8
I feel happy when I am working intensely	3,6	4,2
I am proud of the work that I do	3,5	4,0
I am immersed in my work	4,2	4,5
I can continue working for very long periods at a time	3,8	4,2
To me, my job is challenging	3,2	3,6
I get carried away when I'm working	4,2	4,8
At my job, I am very resilient, mentally	3,2	4,2
It is difficult to detach myself from my job	3,4	5,6
At my work I always persevere, even when things do not go well	4,6	5,2

Solution

1. n1 = n2 = 17
2. Sample 1 – average security values in the experimental group
   Sample 2 – average security values in the control group
3. The maximum value in sample 2 is 5,2
4. Calculate the number of values S1 in sample 1 which are bigger than maximum values in sample 2: S1 = 4
5. Calculate the number of values S2 in sample 2 which are less than minimum values in sample 1: S2 = 4. Q empirical = S1+S2 =4+4=8
6. Use the table of critical values to find Q critical when n1 = n2 = 17 and p=0, 05. Q critical = 7
7. Q empirical = 8 > Q critical = 7. Results in the experimental group can be considered higher than the results in the control group.

Discussion

The proposed discussion outline focuses on seven areas: 1) The attitude of society to learning interventions featuring an unknown subject field; 2) The formation of the learning environment; 3) The psychological diversity of participants; 4) Work engagement; 5) Planning and evaluation of results; 6) social relationships; 7) Personal growth and professional development. These seven areas produce the outcomes which are as follows.

1. Enhancing competence in a social relationship to learning so that Java developers serve as positive and powerful role models in pursuing various learning efforts, statements, and different types of social interaction. Java developers successfully exemplify this ideal.
2. Interventions are effective because they develop qualifications in a learning environment that focuses on the importance of providing a social and physical environment in which all students, regardless of their individual learning differences, can participate in a variety of learning activities and work towards high learning standards.
3. The interventions enhance cognitive competencies in a diversity of learners. Intervention developers can facilitate learning for different types of participants by first recognizing and respecting individual differences, and then using knowledge of learners' differences to design different sets of learning activities to ensure that all learners can achieve their respective learning goals.
4. Participants improve the skills in planning, assessment, and reporting to develop and use a creative and appropriate curriculum, and develop a variety of suitable assessment strategies for monitoring and evaluating learning.

5. Participants improve qualifications for personal growth and professional development, emphasizing the idea that participants may value, having a high personal attitude, care for professional development, and continuous improvement as personalities.

Conclusions

The research has a number of practical and theoretical implications. Describing the value of Java interventions, it may be assumed that this type of intervention is promising because the market for Java developers is constantly growing. This is the major driver of interest towards this programming language.

The targets of these interventions are clear, they are not time-consuming, they do not need expert professionals in psychology. Newly acquired skills offer new visions to shop workers who enjoy the senses of novelty, the enhancement of perceived social support, the development of help-seeking behavior.

The study is limited because it relies on the self-reported questionnaire. However, even this type of questionaries provides shop assistants with an opportunity to describe their insecure, often lonely professional activities which require careful interventions of mind-growing information to ensure the development of engaged malleable personalities.

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