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The Method of Reflective Motivation in the Development of Employee Competencies

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Małgorzata Spychała[1], Małgorzata Sławińska[2]

Abstract:

Purpose: *One of the main characteristics of sustainable human resource management is the development of employee capabilities (*Kramar, 2022). *Wanting to develop this area in organizations, the method of reflexive motivation was developed and applied to developing employee competence. Analyzing the literature in the field of human resource management, no method was found that took into account the development and improvement of an employee's skills based on the analysis of his own level of fatigue.*
Design/Methodology/Approach*: The method of reflective motivation was embedded in Kolb's adult learning cycle. The subject of the study was the fatigue of an employee performing activities at a workstation in the organization. As a result of the identified technical and organizational possibilities, an experiment was conducted, based on which the accuracy of the assumption was confirmed: "Personal involvement and participation in the diagnosis of work processes lead to the development of the employee's competence." In order to monitor the current level of fatigue, biometric indicators of body functioning were proposed using non-invasive devices that record the values of biometric parameters of the employee's body. On the other hand, in order to ensure the confidentiality of the above sensitive data, a personalized diagnosis of ergonomics at work dedicated to such research was created.*
Findings: *The effectiveness of the method of reflexive motivation in the development of competence with the use of biometric data of employees was positively verified, as they personally engaged in improving their way of working and raised their competence regarding the ergonomics of their workstation.*
Practical Implications: *Conducting an experiment with the reflexive motivation method is preliminary research in a systemic approach to improving complex technical-organizational units. In addition, personalized ergonomic diagnosis can also be used to evaluate the effectiveness of training and coaching in preparing workers for difficult and dangerous jobs. The method should be applied to various workstations during the implementation of different work processes so that additional tools can be developed to increase the efficiency of the processes under study.*
Originality/Value: *The method of reflexive motivation is a contribution to sustainable human resource management, which deals with a systemic approach to employee development and improvement.*

[1]*Poznan University of Technology, Faculty of Engineering Management, Poland, ORCID 0000-0003-1471-5536, e-mail: malgorzata.spychala@put.poznan.pl;*
[2]*Poznan University of Technology, Faculty of Engineering Manage-ment, Poland, ORCID 0000-0002-1958-4806, e-mail; malgorzata.slawinska@put.poznan.pl;*

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Paper Type: *Research article.*

1. Introduction

Human resource management (HRM) practices give sustainable opportunities for employees to use their abilities and express their enthusiasm to obtain skills and knowledge and to apply them at the workplace with a view to achieving engaged individuals and increasing organizational performance (Abu-Mahfouz *et al.,* 2023, Venn *et al.,* 2022). Modern economic organizations focus on the continuous development of employees' professional competencies (Kuzior *et al.,* 2023; Treviño-Elizondo *et al.,* 2023; Graczyk-Kucharska *et al.,* 2020, Szafrański *et al.,* 2022).

Boyatzis (1982) a skill, aspect of self-image, social role, or body of knowledge that leads to effective and/or improved job performance. Sparrow (1997) believes that an employee's professional competencies are people's behavioural preferences, i.e., their set of behavioural patterns that are related to job performance and that distinguish excellent performers from average performers.

However, Athey and Orth (1999) believe that job competencies are a set of observable dimensions of performance, including individual knowledge, skills, attitudes and behaviours, and collective team, process and organizational capabilities that are associated with high performance. It follows from the above that individual work competencies are the basic set of employee behaviour patterns related to effective and/or improved work performance, operating at both the individual and collective levels (effective/improved performance in both individual and interpersonal work) (Vakola *et al.,* 2007).

In order to develop and improve employees' knowledge and skills, it is important to pay attention to their personal involvement in the development process (Frezza *et al.,* 2024) According to research by Abu-Mahfouz *et al.* (2023) sustainable human resource management practices, knowledge management and work engagement are positively related to organizational performance. In other words: work engagement will increase with sustainable human resource management through knowledge management.

If you want to develop and improve employees' knowledge and skills, you should pay attention to their personal involvement in the development process (Franus,

1992). By involving an employee in the process of monitoring their own behaviour while performing tasks at work, their hard and soft skills can be developed. Based on the interpretation of the symptoms registered in a specific situation and at a specific time by means of appropriate test measures, an ergonomic diagnosis is obtained, which is the selection of a hypothesis about the state of affairs (Huang *et al.*, 2016).

This information can form the basis for assessing the degree of adaptation of the work process to human capabilities, i.e., the adequacy of tasks and work resources to the situational context of the goal-oriented tasks for which a given person is responsible. However, this requires a special involvement of the employee, thanks to which the recorded symptoms will be correctly interpreted, because the actual work process to be diagnosed is characterised by great diversity and dynamics.

The employee's interpretation of the results, the modification of the work process and, consequently, the adaptation of the workstation to the employee's ergonomic needs lead to an increase in his or her technical competence. The employee becomes responsible for the implementation of the work process and is more aware of the impact of perceived anomalies in the functioning of the body on the effectiveness of professional activities (development of his/her soft skills - social and interpersonal).

He is the central subject of the research process, being at the same time the object of research, the researcher, the analyser and the analysed. The registration of biometric data, which can be integrated with an automatic control system for ergonomic parameters, is a big step towards personalised ergonomic diagnostics.

The main goal of the article is to find an answer to the research question: Does feedback on the perceived abnormalities in the functioning of an employee's body while performing professional activities motivate him to introduce changes in the work process? In order to answer the research question, scientific experiments were conducted based on a personalized ergonomic diagnosis algorithm.

2. Literature Review

Developing an employee's competencies involves changing the scope of his or her knowledge, skills and attitudes in a given area in order to perform new tasks or tasks more effectively (Huang 2016, Spychała andWolnowska, 2019). In order to begin the process of developing his or her competencies, the employee must be aware of his or her deficiencies. Awareness of an employee's lack of competence is one of the stages in the model proposed by Maxwell (1995).

In this approach, professional competencies operate on four levels and their development takes place from unconscious incompetence to unconscious competence. At the first stage of development, the employee is not aware of the existence of competencies necessary to perform a given task. Therefore, their usefulness and effectiveness of the employee is low. When performing tasks at

work, an individual does not know what he or she cannot do and is unable to learn from mistakes. Lack of competence results in inappropriate selection of an employee for tasks or the employee's inability to keep up with the dynamics of professional challenges; unprofessional assessment of the premises for actions or decisions; erroneous actions or decisions with legal, material, financial and reputational consequences; unconsciously erroneous or hasty actions of an employee. Inability to fully perform tasks, inappropriate planning of tasks and resources (Zawiła-Niedźwiecki, 2013).

In the second stage of development, called conscious incompetence, the individual already knows that he or she cannot do something in a certain way. Knowing what he or she cannot do, the employee consciously observes, for example, ergonomic factors that affect his or her efficiency in the work process. The third stage is conscious competence: the worker focuses attention on the task to be performed and the process, which reduces the number of errors but still requires concentration and effort.

This is the stage at which the performer gains experience, draws conclusions and introduces changes in behaviour. The final stage of development is unconscious competence, i.e., a state in which the employee acts in accordance with the required standards without thinking about it. Work is performed automatically and does not require constant control. Filipowicz (2004) adds a fifth stage, which is perfect mastery of the competencies. The employee not only performs tasks fluently, but also uses knowledge and skills creatively, develops attitudes and creates new solutions.

The National Vocational Qualifications System (NVQ) looks at employee skills from a completely different perspective. This system, developed in Great Britain, contains a description of minimum standards for the implementation of systems of tasks and exercises, expressed in a way that allows their observation and evaluation for the purpose of certification. A competence element, expressed in NVQ language, is a description of something that employees should be able to do as part of a specific job. On the basis of these criteria, employees are assessed as competent or not yet competent (Czapla, 2011).

The development of an employee's competence will consist of a continuous learning process, as changing technical, social, economic, ergonomic, legal (etc.) conditions, new needs of customers, employers, force employees to continuously develop. Fostering a culture of continuous learning is essential for the sustainable development of employees in organizations (Lu *et al.*, 2023). When employees are encouraged to become lifelong learners, they become more motivated to continuously develop their competencies.

By performing tasks in a given position and observing experienced workers, the employee expands his knowledge and develops skills through the practical

application of the knowledge acquired. He begins to acquire a particular skill from scratch and, over time, becomes proficient in performing a particular activity. The time it takes to reach the desired level of competence will be different for each employee, because each employee is different in terms of predispositions, acquired skills, personality, etc., (Graczyk-Kucharska *et al.,* 2018)

An employee who has knowledge of the work process, ergonomic factors, is able to objectively determine irregularities in the functioning of his own body while performing tasks, i.e., is involved in the process of observing his own behaviour and, at the same time, the work process, becomes responsible for his own actions, but also for the actions of his colleagues (Golińska andSpychała, 2019)

The process of developing employee competencies is consistent with the adult learning cycle described by D.A. Kolb (Żukowska, 2023). David A. Kolb concluded that the learning process should be viewed as a cycle in which a person's experience and its analysis play a central role. The Kolb Cycle is one of the most effective methods of employee development. According to Kolb, learning is a process of changing existing experience under the influence of new experience. The learning process is most effective when it involves continuous interaction with and modification of previous experience. Based on the individual's experiences and their analysis, Kolb's cycle distinguishes four basic stages:

Stage I - concerns specific experiences of employees in a given job position. When performing a task, employees analyse their behaviour, draw conclusions and convince themselves of the effectiveness of the actions described.

Stage II - reflection - this is a very important stage because it allows employees to become aware, through reflection, of the mechanisms that guide their behaviour when performing tasks at work,

Stage III - aims to test the conclusions drawn in the previous stages against the theory. The employee should summarise the conclusions, name them, develop proce-dures, instructions and models that will be verified in a later stage of the process.

Stage IV - is based on the application of new knowledge (developed procedures, models) in practice. The employee's task is to make any corrections. The essence of this stage is that the learning employee consciously changes his or her behaviour and experiments with the usefulness of the theory in solving problems and making decisions.

3. Research Methodology

The main research problem is to develop a method of reflective motivation for the development of employees' competencies in the workplace. The phenomenon to

which the authors of the designed method directly refer is the fatigue that accompanies an employee during the performance of work. It has been defined by many researchers, of which the following have been selected for the purposes of this study 1) "Periodic disturbance of the balance of basic life processes, leading to a reduction in the ability to work. Work fatigue can also be understood as any change in activity, whether immediate or delayed, caused by the constant performance of that activity" (Wróblewska, 2004) and 2) "Transient reduction in the ability to be active, which occurs as a result of exercise and various biological changes taking place in the body, e.g., tissue hypoxia or depletion of energy reserves" (Gieremek and Dec, 1990).

The main factors influencing the fatigue process are: the type and intensity of the effort, the type of activity performed and its duration, the number and length of breaks and the time of their introduction during work, organisational factors, the employee's motivation and degree of involvement, the employee's health and adaptation conditions, his diet, environmental conditions, the length and use of rest periods between shifts and holiday rest.

In order to increase the effectiveness of the process of developing employees' competencies, it is necessary to select appropriate development methods (Szafrański, 2017). The Kolb cycle should be implemented using many effective teaching methods. One of them is reflective monitoring. It is a method based on people's natural interest in aspects of their own health and reflective monitoring of the situation in which they are involved.

Re-flective monitoring consists of constant observation and analysis of one's own behav-iour and elements of the environment, accompanied by rationalization and motivation of action (Giddens, 2003). Reflection in action therefore presupposes "deep thinking aimed at better understanding" (Cottrell, 2003) which results from the logic of D. Kolb's learning cycle (Figure 1).

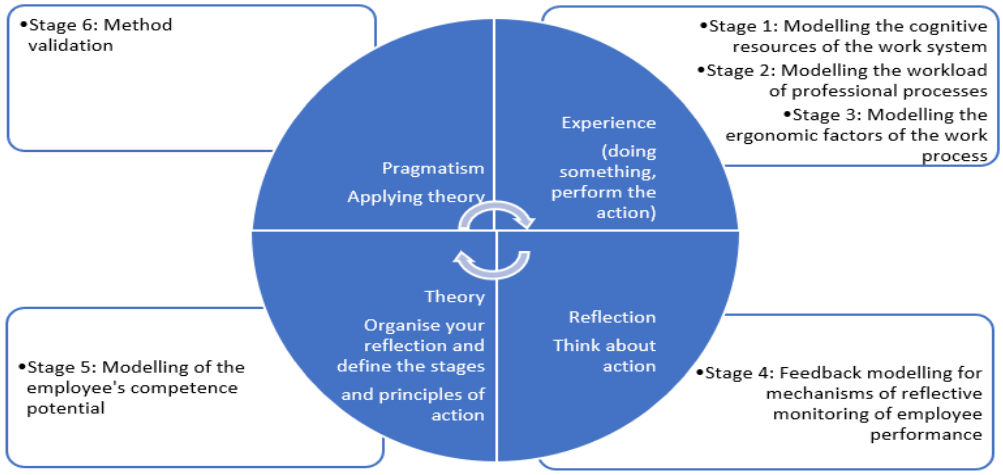
While performing tasks in the workplace, the employee analysed the work process, observed the strains that made it difficult for him to perform the tasks effectively and identified the ergonomic factors of the work process. As he continued to observe the work process, he noticed certain recurring mechanisms, which he wrote down as operating principles and procedures.

He then validated the process model he had developed. By understanding his own behaviour while performing a task, the employee consciously influences the change in the process and thus develops his hard and soft skills. The basis for the reflection was the design of subsequent versions of the model based on the experience of the functioning of the body in terms of psychophysical capabilities.

Biometric indicators of bodily functioning were proposed to monitor the current level of fatigue. The use of noninvasive devices that record the values of biometric

parameters of the employee's body allows such research to be carried out in real-time. However, in order to ensure the confidentiality of the abovementioned sensitive data, a personalised diagnosis of work ergonomics has been created for such research (Sławińska, 2022). Creating conditions for personalised analysis of ergonomic factors is the basis for reflective monitoring, rationalisation and motivation.

Figure 1. *Main Stages of Employee Competence Development According to the Kolb Cycle*



Source: *Own creation.*

4. Research Results

The authors design an environment for the development of professional competences in the area defined by the organisation's objectives, through a research process and the execution of sequential scientific tasks in the following stages:

Table 1. *The method of reflective motivation in the development of employee competencies*

Stage 1: Modelling the cognitive resources of the work system	
Z11	Modelling the work situation based on the table of employee responsibilities and rights
Z12	Develop principles for modelling the structure of organisational goals (building a bundle of goals)
Z13	Creating a map of competencies in the hierarchical structure of the organisation
Stage 2: Modelling the workload of professional processes	
Z21	Develop a taxonomy of professional activities based on the characteristics of the work process state vector (executive activities of decision-making tasks).
Z22	Development of a map standard for decision processes
Stage 3: Modelling the ergonomic factors of the work process	
Z31	Development of a method for personalised ergonomic diagnosis

Z32	Development of guidelines for the implementation of personalised ergonomic diagnosis - based on the NASA TLX categories
Z33	Develop a task load map diagram
Stage 4: Feedback modelling for mechanisms for reflective monitoring of worker performance	
Z41	Develop a process for mapping problem situations based on biometric indicators - heart rate
Z42	Develop principles for mapping causal relationships for designing employee competence development paths based on the problem event tree.
Stage 5: Modelling the employee's competence potential	
Z51	Develop a process for developing job competencies based on the deficit causing excessive employee fatigue.
Z52	Design career development paths based on minimal sections of the problem situation tree.
Step 6: Validating the method	
Z61	Establish a standard for the cost of fatigue based on subjective perception
Z62	Establish a procedure for applying the relative task load index of the NASA TLX method.

Source: *Own creation.*

In each organisational unit there are various records created in the course of detailed diagnoses, because the data and information contained in them support decision-making processes at all levels of management and in executive positions, and these records are created with the participation of the employees involved. Improve-ment of work ergonomics requires systematic analysis of data in appropriate sections and on the required scale (Sławińska and Butlewski, 2014).

Tracking the connections that occur between the problem and the effect of the ergonomic parameters introduced into the system with recommended models and appropriate scenarios provides feedback on the effectiveness of ergonomic interventions (Butlewski *et al.,* 2014; Espasandín-Bustelo *et al.,* 2021; Sławińska and Wróbel, 2021).

In data processing in this aspect, it is necessary to use applications that generate feedback, without which it is impossible to obtain information in real-time. In most cases, tools used for diagnosis in ergonomics are constructed in such a way that at the final stage of diagnosis the researcher has access to explanations of the analysed phenomenon and receives instructions for further action. As a result of the system analysis carried out, a coherent information environment is created for the implementation of individual ergonomic interventions and for tracking their influence on the system in different situational contexts.

The electronic resources of ergonomic knowledge that have been created significantly support comprehensive diagnosis. The development of functionalities such as the acquisition, collection, processing and exchange of data in applications dedicated to design raises the expectations of users of all products.

In the human-centred approach to the design of work systems, the basic direction of research procedures is to optimise employee fatigue.

The most common research methods include, first of all, interviews with the help of questionnaires, thanks to which, at the stage of preliminary research, it is possible to obtain guidelines for further diagnosis or the creation of solutions to prevent the problem from spreading (Horst, 2004; Sikorski, 2010). Conducting an interview using checklist sheets is equally effective in assessing the causes of fatigue (Pacholski and Jasiak, 2011; Berlik *et al.,* 2019).

A broader task context is obtained by conducting observations during which detailed task processes are recorded, e.g., using mapping techniques (Ewertowski *et al.,* 2020). The documentation developed in the detailed diagnosis phase is the starting point for ergonomic modification, during which simulation tests (Chaffin, 2007; Sławińska *et al.,* 2018) and numerous experiments are carried out (Berlik *et al.,* 2018; Sławińska and Wróbel, 2021).

These are the basic methods of systems analysis, complemented by physiological measurements, which can be safely described as the main tools for assessing the effectiveness of ergonomic interventions. They are often used by researchers and designers of conditions that eliminate the causes of fatigue (Walkowiak and Sławińska, 2020; Pieniążek, 2014).

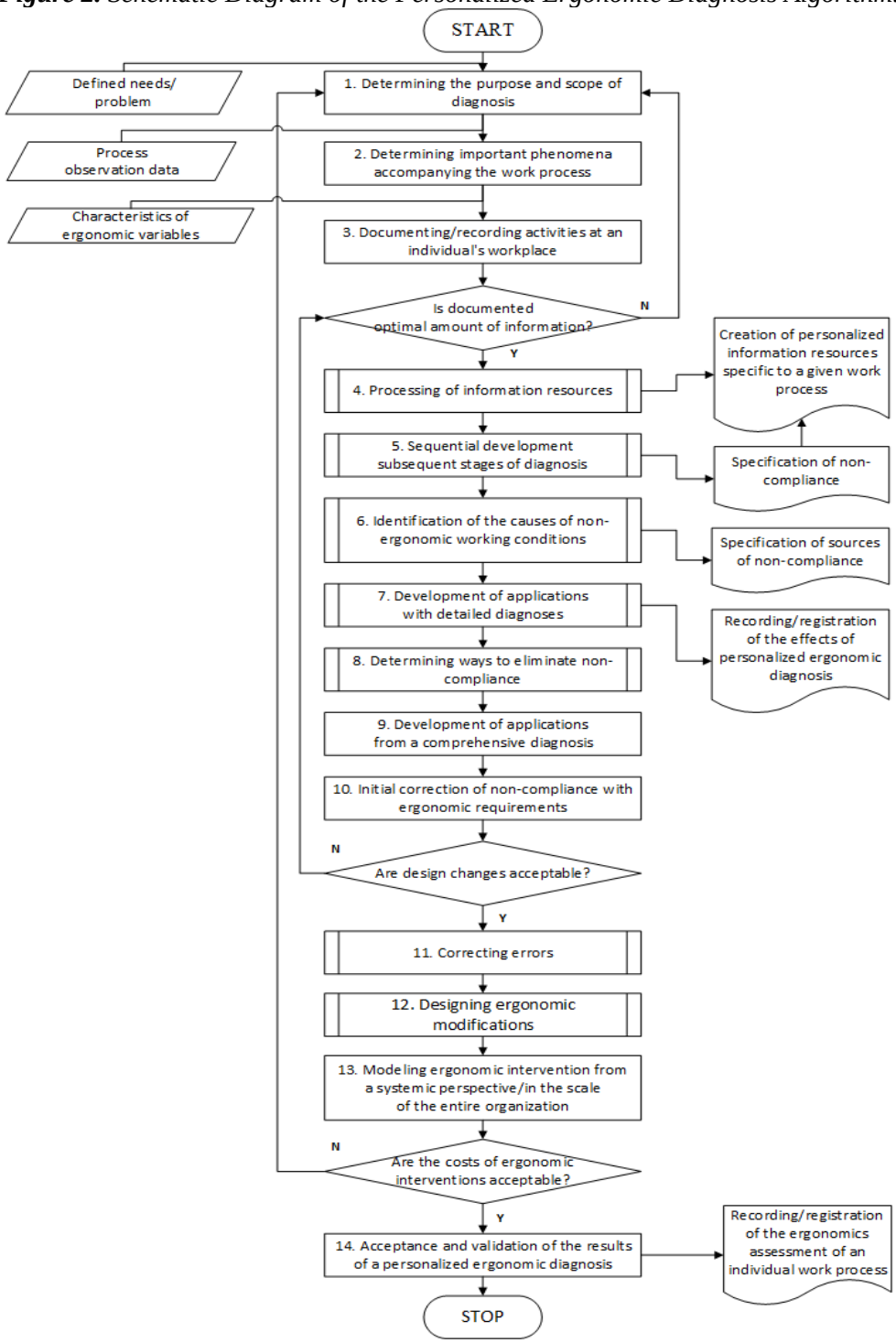
Projection methods are used, among other things, to validate the technical and organisational parameters of the designed work methods. In the example of the study of computer workstations for the elderly, the use of projective methods enabled the identification of 34 interaction errors and the indication of their possible causes (Wróbel and Sławińska, 2019).

All the abovementioned tools for diagnosis and ergonomic design have one thing in common: they require the presence of a researcher at the workplace, and on several occasions.

Before starting the scientific experiments, a research question was posed: "Does feedback on the perceived abnormalities in the functioning of the employee's body while performing professional activities motivate him to introduce changes in the work process?".

In order to answer this question, scientific experiments were carried out based on the personalised ergonomic diagnosis algorithm (Fig. 2). To this end, eight interested people were given biometric data recording devices, which allowed, among other things, heart rate, blood saturation, energy expenditure and stress levels to be recorded.

Figure 2. *Schematic Diagram of the Personalized Ergonomic Diagnosis Algorithm.*



Source: *Own creation.*

The following people were invited to join the research group: an employee who works as a baker, an employee who works in a technical and administrative position, a teacher who works in an educational institution in the pre-school department, a person who manages a micro-enterprise, an employee of a design office who works in engineering, a person who works in accounting and two people who work as academic teachers.

In the first stage, the purpose of the research and the plan for carrying it out were discussed, and the possibilities of documenting and creating records of biometric data during work using personal measuring devices were presented. At the same time, the method of data collection was discussed. Heart rate (HR) and heart rate variability (HRV) were the main indicators used to measure employee experience, as they can be correlated with physical and mental workload (Mulder *et al.*, 2004).

The literature on this issue also lists other indicators, including: analysis of electroconductivity activity, electroencephalography, electromyography and the use of accelerometers and gyroscopes, for example in smartwatches and smartphones, which have also been used in research (Moschetti *et al.*, 2016).

Realtime testing was proposed because it allows for faster generation of output data and, in addition, the data is much more accurate. It was proposed to measure the employee's pulse throughout the day, draw conclusions on the basis of objectively obtained figures of increase or decrease during the performance of certain activities, and correlate these values with the working time.

In Stage II, initial attempts were made to collect information on the state of the body. For this purpose, consultations and tests were carried out over a period of time appropriate to the individual. In this way, the employee moved from the phase of gaining experience to the phase of acquiring knowledge and preparing to independently observe ergonomic variables.

In Stage III, traditional methods of creating records of the work process were discussed, including: the use of mapping techniques (Sławińska, 2011). Records kept in this way constitute documentation of accompanying phenomena and are helpful for a broader interpretation of the problem.

In Stage IV, detailed diagnoses were made, records were created using tools designed for diagnostic tasks and necessary measurements, thanks to which problems were identified. Early detection of abnormal conditions allows corrective action to be taken, so monitoring of human stress and unreliability indicators should be continuous. The analysis of biometric indicators is crucial for defining effective ways of working, optimising tasks, and adapting the workplace to the employee's capabilities and the requirements of the work process (Romero *et al.*, 2016).

In stage V, the employee independently evaluated the biometric data (Figure 2) and

made the decision to share or not.

At stage VI, a comparative analysis of the records of professional activities and the chronology of registered indicators of the employee's body functioning during work was performed, to the extent agreed by the employee.

At stage VII, the situational context of the purposeful tasks was described jointly by the researcher and the employee, which preceded the clear change in the biometric data recorded on the timeline.

In Stage VIII, the employee independently tackled the problem of identifying opportunities that, in his opinion, could have a positive impact on the improvement of working conditions. All solutions that change the working conditions are discussed with an expert using available instant messengers. For this purpose, descriptions of situational scenarios can be used, which very well reflect the knowledge of the work situation (Walkowiak andSławińska, 2020).

In Stage IX, the time and cost implications of the proposed changes were estimated. Simultaneously with the creation of changes and consultations based on employees' opinions, it was concluded that during the research process there was a significant development of employees' personal experiences and competencies.

In stage X, the experiment was summarised. Possibilities for further self-registration of information related to the monitoring of the work process and further improvement of the ergonomics of working conditions in the company were identified. The research question was answered positively: "Feedback on perceived abnormalities in the functioning of the employee's body during the performance of professional activities motivates him/her to introduce changes in the work process".

5. Discussion

As a result of the technical and organisational possibilities identified, an experiment was carried out which confirmed the accuracy of the hypothesis adopted: "Personal involvement and participation in the diagnosis of work processes lead to the development of employees' competencies".

Recording data in real-time in connection with documenting the progress of targeted tasks and using mapping techniques and so called self-recording. The use of devices to measure heart rate in organisations is based on low cost, noninvasiveness and durability, which is why a heart rate sensor was used in the method of personalised ergonomic diagnosis. The information obtained in this way is of interest to every employee. When performing these tasks, it is a good idea to use devices that record biometric data.

During the research, attention was paid to ensuring that the employee is able to

independently and personally analyse the data collected on the functioning of his or her body, and that the data can only be used with the employee's consent.

This objective requires commitment and motivation from companies and their employees. Therefore, through the six stages of the reflective motivation method, employees can develop their competencies and excel by cultivating the ability to be resilient and adapt to change with a strategic, planning mindset. As a result, they can specialise and become experts in their field of work.

Every organisation should have factors that facilitate the development of employee competencies. In order to ensure the conditions for the development of competences, the following conditions must be met:

- the actual and target status of individual competencies should be known and made known to all interested parties,
- access to knowledge (e.g., know-how, experts) and sufficient resources (e.g., budg-et, time) should be provided,
- create a culture in which the development of competencies is perceived as an added value and a development factor for the organisation,
- competency assessment should include an analysis of competency gaps and identification of ways to fill them,
- competence development should take place by creating conditions for continuous improvement.

Conducting an experiment using the reflective motivation method can be accepted as preliminary research in a systemic approach to improving complex technical and organizational units. Additionally, personalized ergonomic diagnosis can also be used to assess the effectiveness of training and training in preparing employees to perform difficult and dangerous professions, which was verified during glider pilot training due to the position adopted, which is forced by the shape of the cabin space and the arrangement of control elements (Berlik *et al.*, 2018).

6. Limitation of the Study

The developed research method should be verified in real working conditions, because the pilot studies were carried out in remote working conditions, during the pandemic. The method should be used at various workstations, during the implementation of various work processes, so that additional tools can be developed to increase the effectiveness of the examined processes.

7. Conclusions

The developed method of reflexive motivation, embedded in Kolb's adult learning cycle, takes into account the analysis of one's own fatigue level. The employee's current level of fatigue is monitored using biometric indicators of bodily

functioning. Taking care of the confidentiality of the above sensitive data, a personalized diagnosis of ergonomics at work dedicated to such studies was created.

An employee who has knowledge of the work process, ergonomic factors, is able to objectively determine the abnormalities of the performance of his own body while performing tasks, that is, he is involved in the process of observing his own behavior and, at the same time, the work process, becomes responsible for his own actions but also for the actions of his co-workers (Golińska and Spychała, 2019).

This is a new approach to employee sustainability in the organization, which takes into account personal involvement and participation in diagnosing work processes.

As a result, organizations that focus on sustainable employee development can achieve a competitive advantage in the marketplace while fostering a motivated and engaged employees.

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