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Article

Conceptual aspects of cognitive ergonomics and job design

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Abstract: The study of cognitive ergonomics and correct job design is a contemporary topic. This article defines and presents the main issues that ensure effective management of cognitive ergonomics and job design.

Keywords: cognitive ergonomics; job design; incentive; work-life balance

1. Introduction

Cognitive ergonomics and work-life balance are one of the most interesting challenges of the 21st century, and at the same time, it is an important component of job design. Ergonomics is a science that aims to increase human cognitive and mental abilities, and productivity by reducing discomfort and improving working conditions. This means job security, relaxation opportunities, and various activities that help the company recruit and retain a highly motivated and satisfied workforce.

Cognitive ergonomics is responsible for how the employee understands and performs the assigned work. It also covers analyzing and dealing with work stress (Hollnagel, E. 1997).

Modernity, also known as the age of digital technologies, which is distinguished by the accelerated pace of geometric progression, presents the modern person with the greatest challenge—he has to receive, process, and assimilate rapidly changing information in the shortest period, keep pace with the constantly growing demands of the labor market, perform the assigned work conscientiously and perfectly, and, at the same time, constantly taking care of one's development, in order to be a competitive and stress-resistant being (IEA 2014).

Today's reality has changed approaches to business careers. In the presence of an incorrect career management system, a person is often unable to fully unleash their potential, or the job scope does not meet their expectations. These reasons could create an undesirable working place and environment.

The negative consequences of improper career management can be described from two perspectives. On the one hand, when an individual is not satisfied at work, their psychological state will be affected. The disappointment that comes with making the wrong career choice and getting into the wrong place of employment has a directly proportional negative impact on one's personal life. On the other hand, poorly managed work design by managers and directors may lead to a shortage of professionals in the country and their outflow.

Modern career management systems allow for ensuring the professional development of a person, as well as determining the direction of one's further development based on the assessment of his abilities.

The research questions of the paper are as follows:

1) What aspects determine the effective management of cognitive ergonomics and work design?
2) How can incentives affect performance?

2. Literature review

Current transformations and changes in the modern world have had a significant impact on the human resource management process. In the past, the public and private sectors were mainly focused on attracting and recruiting staff; today, staff retention is a bigger challenge.

It is also important to take into account the modern challenges in the process of career management. The previous generation was guaranteed to continue working in the chosen profession for the rest of their lives. However, nowadays, career switching and job-hopping are common. Therefore, excellent management and leadership are pivotal to ensuring staff retention (Cavoulacos and Minshew, 2017).

Research shows that a stressful working environment not only has a negative impact on the quality of work but also the personal lives of the employees. As a result, problems such as work stress, depression, weight gain, etc. follow (Penn, 2013).

Studies reveal that ergonomic conditions impact a person's personal and family life. Additionally, the family and the micro-society in which a person interacts daily significantly influence their career role and development. In the 1950s, an American representative of clinical psychology and researcher Anne Roe (Anne Roe (1956)—theory of Career Choice and Development), who became a prominent representative of occupational psychology, was interested in this issue. Ann Roes's theory of career choice and development places a major emphasis on the role of the family in career management, particularly the influence of family relationships on career choices. Excessive care for a child can diminish their independence and foster a fear of decision-making in adulthood. Conversely, neglecting a child's interests can result in limited opportunities in later life. According to the author, the ideal option is unconditional acceptance of the child's needs and behavior. People brought up in such an environment are independent and manage their careers successfully. In her theory, Ann Roe proposes to classify the profession by taking into account two main factors, person-oriented and non-person-oriented cases (Roe, 1956).

A very interesting theory was developed by the modern American education specialist Duane Brown (2006) regarding work-life balance. According to Brown's theory, career and employment aspects are influenced by several values. Brown focuses on three types of values, namely: cultural, labor, and life values (Brown, 2002). It divides cultural values that influence career and employment into the following categories: human nature, social relationship, temporal orientation, relationship with nature, activity, and self-control. Brown considered work values to satisfy such needs as recognition from the collective, financial well-being, altruism, and others. Life values cover work, recreation, community membership, interpersonal relationships, and others. Individuals often choose a profession and adjust to their roles based on these values. Brown considers cultural and work values as fundamental values that affect the process of choosing and maintaining a job, while life values significantly affect the entire process of career development (Brown and Crace, 1996). When employers create and uphold work designs and values that align with those of their employees, it enhances retention and motivation.

It is also an interesting issue to explore whether incentive pay can affect performance, and if so, how it does so and which factors play a major role.

In general, the impact of incentives on performance depends on various factors, such as the employee's needs and preferences, as well as timing. Incentives are typically ineffective when employees lack motivation or cannot influence the outcomes. Motivation works for everyone in different ways, because what motivates one person may not motivate the other. Incentives can be created both directly and indirectly. When the objective is clear, compensation such as cash payments or additional services can be offered for achieving it. Literature and practice provide examples where direct incentives for specific tasks can be overly effective, causing individuals to neglect other responsibilities.

For example, before the Soviet Union collapsed in 1989, Western publications often reported on the goal distortion and corruption endemic to Soviet attempts to manage the economy by mandating quantitative results. Industrial planners established targets for enterprise production and punished managers who failed to meet them. There were targets, for example, for the number of shoes to be produced. Certainly, increasing output was an important goal of the Soviet shoe industry, but it was not the only goal. Factories responded to the incentives by using the limited leather supply to produce a glut of small sizes that consumers could not use. Planners specified the number of kilometers that freight transport enterprises should cover each month. Certainly, transporters who cover more distance can deliver more goods. But when distance itself was incentivized, the haulers fulfilled their quotas by making unnecessary journeys or driving circuitous routes (Springer, 2009). Incentives affected people's behavior, but they failed to promote the social cooperation necessary for a productive economy.

Rewards do not have to be monetary, they can be anything that employees value. For example, managers in some organizations have little flexibility in what they pay employees. Incentives can be provided by rewarding more productive employees with desirable job assignments, better offices, preferred parking spaces, special honors, and trips to training sessions in attractive locations (Brickley et al., 2003).

For more than 15 years Thomas J. McCoy (1992) has improved the performance of organizations through improving the performance of their employees. In his book *Compensation and Motivation, Maximizing Employee Performance with Behavior-Based Incentive Plans*, published in 1992, he spells out the details of his innovative behavior-based incentive compensation system.

Behavior-based incentive compensation (BBIC) differs from traditional compensation in three significant areas: 1) The plan design requires a high degree of consideration of human resources as well as of finances; 2) BBIC is contingent upon performance; 3) It is extremely flexible in its ability to produce improvement in any area of organizational need.

No compensation system meets all needs, but the unique flexibility of behavior-based incentive compensation allows it to be applicable in a wide variety of business environments and on all levels of an organization (McCOY, 1992).

Incentive Compensation Management refers to the system and practices supporting the payment of variable compensation by companies to their sales force, agents, or other entities whose performance against desired metrics can help the company be more successful (Kelly, 2014).

For example, as far back as 1985, Frito-Lay's management accepted the fact that improvements in the technology of their business would bring only a limited degree of incremental improvement. David Halleck, manager of compensation at Frito Lay, wanted to determine to what extent the rewards influence employee motivation. The task force assignment was to develop a program that supported the business strategy through the coordination of management practices, employee participation, and shared rewards. The result of the assignment was a productivity incentive plan based on cost, quality, and productivity volume. Employee participation and feedback systems were designed and installed to support the process. In addition, incentive plan success criteria were designed and incorporated into the review cycle (McCOY, 1992).

Frito-Lay has a cultural history of utilizing the test process to explore different alternatives. Like many organizations, they use testing as a method of gaining company-specific information and data for assessment. Two plants were selected to participate in the test of incentive compensation. One plant was to be the test plant; the other plant was to be the control. The plants were selected based on a list of criteria that included comparable plant size and age, similar workforce demographics and experience, similar styles of management, and commonality of products (this would remove any variance based on seasonality).

The results were positive. At the test plant, cost and quality performance each improved by more than 10%. At the control plant, an increase in volume affected the cost indicators and an increase in new employees affected the quality measurements. Cost performance improved by 3%, and quality performance improved by 4%. (Management feels that if these changes had not taken place, performance in both categories would have improved by greater than 10 percent). To add perspective to the performance improvement, it is significant to note that the average Frito-Lay plant had an annual improvement rate of 5 percent in both cost and quality during this year. Employee ideas increased by 30 percent in the test plant, by 20 percent in the control plant, and by 10 percent in the average plant in the system (McCOY, 1992).

As part of the evaluation, Frito Lay's management conducted preplan and post-plan opinion surveys. The results and variations in the survey responses are as follows (**Table 1**):

Table 1. Results and variations in the survey responses.

	Percentage Increase, Control Plant	**Percentage Increase, Test Plant**
Feedback	4%	10%
Communications	5%	10%
Working Conditions	4%	9%
Employee/Management Relations	6%	10%

Employees at both facilities reported feeling that their job security had improved. They saw the program as an indicator of management and viewed that as a positive addition to the environment (McCOY, 1992).

A notable discrepancy in performance outcomes was observed, with nearly a two-to-one difference between the test plant and the control plant. Both plants offered the same intrinsic motivation to enhance performance, and the control plant demonstrated that intrinsic incentives alone had a positive impact on results. Both facilities implemented identical training, performance feedback systems, and employee participation processes. The distinguishing factor was that one plant offered extrinsic incentives, which notably bolstered the performance improvement process.

There is a very interesting theory about "carrots and sticks". "Carrots and sticks" refer to using rewards and punishment to motivate others. This system is based on the principles of operant conditioning. Similarly, there is the expression "carrot-on-s-stick", which conjures up the image of a carrot tied to a stick held just beyond the reach of a donkey to encourage the animal to go faster. In organizations, "carrots" refer to rewards or incentives dangled in front of employees to motivate them to strive toward some goal. These incentives range from coffee mugs to lucrative financial bonuses and everything in between. The obvious assumption is that employees are motivated by the particular carrot being offered (Marciano, 2010).

Motivation in the workplace changes with time. The workplace and its employees today, for example, are very different than they were before the second half of the twentieth century. One of the big changes is employees' expectations and their relationship to their work. Managers, leaders, and human resources professionals must be willing to give up traditional beliefs about the role of motivation and factors that affect employee motivation to deal with today's workforce effectively.

Whether a person enjoys his or her work is a recent and primarily Western Phenomenon. Certainly, through the 1950s, work served the primary purpose of putting food on the table and a roof over one's head. While people undoubtedly developed friendships at work and may even have enjoyed their work depending on their profession and position, such issues were not viewed as particularly relevant to making a living. Over the past few decades, the level of satisfaction and meaning of the work has been increasingly emphasized. This is particularly true once employees reach a certain monetary threshold that comfortably provides for their quality of life. Today's leaders who wish to maximize the productivity of their employees must fully understand and embrace the notion that employees work for more than just money; they work to feel good about themselves (Marciano, 2010).

Money can motivate individual performance, but the impact on performance is typically short-lived. Money falls under what Frederick Herzberg called a Hygiene factor, in other words, a factor that has more to do with decreasing motivation than increasing it. Money matters a lot under two conditions. First, it matters at the very low end of the pay scale where an additional dollar an hour can make a significant difference to an individual. Second, it matters when people find out that they are being under-compensated relative to a colleague or market value; this situation violates the Equity Theory. A classic example occurs when a new employee is hired at a higher salary than an existing employee doing the same job. Under these conditions, the existing employee, who may have been perfectly satisfied with his pay, becomes upset and feels unappreciated. Typically, the employee will quit, demand more pay, or perform markedly worse.

Motivation techniques can be very helpful in raising a person's level of readiness to change and in getting him or her to begin engaging in desired behaviors. In the words of Jim Ryun, "Motivation is what gets you started; habits are what keep you going" (Marciano, 2010).

In Paul L. Marciano's "*Carrots and Sticks Don't Work, Build a Culture of Employee Engagement with the Principles of RESPECT*" (2010) specified twenty reasons why reward and recognition programs do not work. These reasons are summarized in **Table 2**.

Therefore, it is clear that even rewards that might appear to be desirable do not necessarily work for everybody (Marciano, 2010).

One of the major reasons that reward and recognition programs are unfairly administered is that the program guidelines are unclear and open to interpretation.

Trying to motivate employees with "carrots" will not increase the overall human capital of the organization.

This topic is highlighted in the RESPECT Model, an actionable philosophy founded on the principle that when individuals are treated with respect, they are more engaged and motivated to strive toward the organization's goals. Over the past few years, a handful of researchers from around the world have empirically supported this premise, most notably Ed Sleebos, Naomi Ellemers, and Dick de Gilder from the Netherlands. These researchers have demonstrated in both laboratory and field studies that when people feel respected, they exhibit greater discretionary and effort to benefit the group and organization. In addition, their research uncovered that when disrespected individuals exhibit discretionary effort, they do so to achieve personal gain—not to advance the goals of their group. These findings validate the basic premise of the RESPECT Model and highlight the distinction between engaged employees who work for the betterment of the organization and motivated employees who work for themselves. Based on engagement research, the Circle of RESPECT distinguishes five areas in which employees experience feelings of respect and disrespect (Marciano, 2010).

Table 2. Twenty reasons why reward and recognition programs do not work (Source: Marciano, 2010).

Reason 1	Programs fail because they are programs.
Reason 2	Rewards are not necessarily reinforcing.
Reason 3	Programs are too narrowly focused.
Reason 4	Programs focus on the wrong dependent variable.
Reason 5	Goals can limit performance.
Reason 6	Inconsistent and unfair administration.
Reason 7	Added stress for supervisors.
Reason 8	Programs foster cheating.
Reason 9	Programs destroy teamwork.
Reason 10	Programs are cover-ups for ineffective supervisors.
Reason 11	Programs offer a weak reinforcement schedule.
Reason 12	Giving gifts is not a reinforcement program.
Reason 13	Programs reduce creativity and risk-taking.
Reason 14	Extrinsic reinforcement reduces intrinsic motivation.
Reason 15	Wrong behaviors are rewarded.
Reason 16	Everybody’s a winner.
Reason 17	Programs are manipulative.
Reason 18	Program architects are generally not experts.
Reason 19	Programs have no impact on workplace culture.
Reason 20	Reward programs decrease overall motivation.

Figure 1 shows the Circle of RESPECT.

Figure 1. Circle of RESPECT (Source: Marciano, 2010; Marciano, 2011).

All points above are taken from Paul L. Marciano, Ph.D. *Carrots and Sticks Don't Work, Build a Culture of Employee Engagement with the Principles of RESPECT* (Marciano, 2010).

It is interesting that whether on the battlefield or in the boardroom, people follow leaders they respect and by whom they are respected. Respect brings with it great power to influence others and their behaviors. Respected leaders inspire followers to engage in the work that needs to be done to fulfill the mission and vision of the organization. Leaders must earn respect by treating those around them with RESPECT every day and not assume, that respect should be automatically bestowed upon them based on their position and achievements.

Paul L. Marciano concludes his book *Carrots and Sticks Don't Work, Build a Culture of Employee Engagement with the Principles of RESPECT* with the sentence:“ If you want the most out of your people, treat them with respect and they will respect and do more for you” (Marciano, 2010).

3. Conclusion

In short, recognition and a sense of purpose are often more important than money (salary) for most people. Hence, leaders should ensure that every worker feels valued and integral to both the organization and society. Additionally, they should communicate information regarding plans and achievements to their subordinates and actively consider their suggestions for enhancing plans and workflow.

Leaders should allow some form of independence among their workers, which can be manifested in the following ways:

Facilitating information exchange with subordinates and involving them in decision-making processes enables leaders to address individuals' fundamental needs. Consequently, this elevates motivation levels and diminishes dissatisfaction with formal leadership.

According to human resources theories, work is inherently satisfying for most individuals, as they aspire to contribute to the attainment of the organization's objectives. Many people are capable of working independently, exercising considerable responsibility and self-control. In such instances, the primary responsibility of a leader is to maximize the effective utilization of human resources. This entails creating an environment wherein each individual can demonstrate their abilities in successfully addressing the organization's challenges.

Special emphasis should be placed on the involvement of personnel in solving important problems of the organization and increasing their independence and self-control. This contributes to improved economic efficiency in production. Consequently, job satisfaction increases, facilitating guidance and refinement of work design.

Furthermore, while incentives can affect performance, their effectiveness hinges on various factors including employees' needs, preferences, and ability to impact results. Cultural disparities and economic situations also play significant roles in determining the efficacy of incentive schemes.

Moreover, while money can initially motivate individual performance, its impact tends to be short-lived. Employees are driven by more than just financial incentives; they seek fulfillment and a sense of accomplishment in their work. Long-term incentive structures often fall short in sustaining motivation. Motivation techniques can be effective in elevating an individual's readiness to engage in desired behaviors.

However, reward and recognition programs are sometimes inefficient and costly. Unclear program guidelines often result in unfair administration. Strong motivation and respect have a more enduring and positive impact on performance.

This paper shall conclude with a quote from Thomas Alva Edison: "One might think that the monetary value of an invention constitutes its reward to the man who loves his work. But I continue to find my greatest pleasure, and so my reward, in the work that precedes what the world calls success."

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