

Measuring Innovation Capability on Individual Level: Challenges and Solutions

Laman Gasimzade*

¹University of Miskolc, Hantos Elemér Doctoral School of Business, Management and Regional Sciences, H-3515, Miskolc.
Egyetemvaros, Hungary

*(laman.gasimzada97@gmail.com)

(Received: 20 May 2025, Accepted: 18 June 2025)

ATIF/REFERENCE: Gasimzade, L. (2025). Measuring Innovation Capability on Individual Level: Challenges and Solutions. *International Journal of Advanced Natural Sciences and Engineering Researches*, 9(6), 209-217.

Abstract – This paper explores the essential role of individual innovation capability in organizational growth and economic development. It highlights the importance of personal entrepreneurial traits, particularly in developed countries, and critiques commonly used assessment tools like 360-degree feedback and InnoQuotient for their limitations. The Berkeley Innovation Index is identified as a more effective alternative due to its focus on individual traits. The study also emphasizes the impact of psychological, organizational, and ethical factors, along with knowledge sharing, on individual innovation. It concludes that innovation at the individual level is complex and requires flexible, inclusive assessment frameworks.

Keywords – Individual Innovation Capability; Creative-Thinking; Entrepreneurship; Assessment Frameworks; Psychological and Organizational Factors; Knowledge Sharing;

I. INTRODUCTION

Individual innovation capability refers to a person's ability and willingness to generate, develop, and implement novel ideas that contribute to organizational or societal progress. It encompasses not only creativity but also the motivation, behavior, and contextual factors that support innovation at the individual level. The ability of individuals to innovate is essential for organizational adaptability, problem-solving, and sustained progress. It also plays a key role in driving economic growth, particularly through entrepreneurial initiatives. Numerous studies have attempted to determine the causes of innovativeness, but the findings have been inconsistent. Some studies, for example, have concentrated on organizational aspects (Shanker, Bhanugopan, van der Heijden, & Farrell, 2017), whereas others have focused on psychological aspects (Lu, Lin, & Leung, 2012). In a review study outlining the historical roots of innovativeness, Parzefall, Seeck, and Leppanen (2008) noted that the majority of research have concentrated on standalone factors, and an integrated view is missing. Assessing individual innovation capability is challenging due to its reliance on diverse personal traits, psychological factors, and work environments. Without a universal framework, measurements can be inconsistent and overlook key aspects such as mindset and motivation. These limitations underscore the need for more comprehensive and adaptable assessment methods. This paper aims to explore the key challenges and potential solutions related to measuring individual innovation capability. The central research question guiding this study is: What are the main obstacles in assessing innovation capability at the individual level, and what approaches have been suggested in the literature to overcome them? By addressing this question, the paper seeks to offer meaningful insights into improving

assessment methods and supporting the development of individual innovation within organizational settings.

II. MATERIALS AND METHOD

The goal of this study is to explore the major barriers to effectively measuring individual innovation capability and to examine the solutions proposed in academic research. To achieve this, a wide range of scholarly literature was reviewed, encompassing peer-reviewed articles, academic texts, and reports from credible institutions known for their contributions to innovation studies.

The literature was gathered from prominent academic databases, including Scopus, Web of Science, PubMed, and Google Scholar, ensuring a diverse collection of perspectives. Special attention was given to recent publications to capture emerging themes and up-to-date approaches in the assessment of personal innovation potential.

A targeted search strategy was applied using keywords such as “individual innovation capability,” “innovation assessment,” “creative thinking,” “entrepreneurial behavior,” “knowledge exchange,” and “psychological dimensions.” These terms were chosen to reflect the multifaceted nature of individual innovation and to ensure comprehensive coverage of related topics. Additional studies were identified by reviewing citations and reference lists within selected sources.

Inclusion criteria focused on works that provided direct insights into how innovation capability can be evaluated at the individual level. Both conceptual discussions and empirical investigations were considered, particularly those that explored personal traits, work environment influences, and motivational factors. Studies limited to sector-specific analysis were included if they offered transferable insights. Non-English sources were excluded to maintain consistency in language interpretation.

A qualitative approach was used to analyze the selected literature. Key themes, assessment challenges, and proposed evaluation models were extracted and grouped according to common patterns. This thematic analysis made it possible to highlight recurring issues, innovative measurement tools, and opportunities for further exploration in the field.

By applying this methodology, the study delivers a critical overview of current practices in assessing individual innovation capability, offering practical implications for researchers, organizational leaders, and innovation strategists looking to improve how innovation is identified and supported at the individual level.

III. RESULTS

A. Key Determinants of Individual Innovation within Organizations

Individual innovation can merely originate from one of the most complicated parts of an organization, which is human resources. Within an organization, employees are utilized and handled as assets and an element of the manufacturing process. However, this ‘human capital’ is not just a straightforward economical asset of the company. Employees can reflect, be enthusiastic about their jobs or they can choose not to. All these aspects are distinct and ought to be considered when looking for the perfect working atmosphere where innovation at individual level can be encouraged.

The framework by Hammond et al. (2011) performed a systematic review of the determinants of innovation at individual level, where four factors of significance are revealed, which are the following:

Individual Differences - Traits like thinking style, personality, and openness to new experiences influence a person's ability to think creatively and solve problems.

Motivation and Passion - Intrinsic motivation drives individuals to go beyond basic duties, take initiative, and persist in finding creative solutions.

Job Design - Tasks that are engaging, meaningful, and offer autonomy tend to promote innovation, while repetitive work may limit creativity.

Work Environment - Supportive leadership, collaboration, and psychological safety are key external factors that encourage individual innovation.

B. Entrepreneurship in the Context of Individual Innovation

Entrepreneurship, within the context of individual innovation, refers to the personal initiative and creativity of individuals who generate and implement new ideas that lead to meaningful change. It is one of the most visible and impactful expressions of innovation at the individual level, often resulting in new ventures, processes, or products that reshape industries and markets.

Some scientists have stated that not all kinds of self-employments can be regarded as entrepreneurship and have identified it as the introduction of new economic activity by an individual that results in shifts in the marketplace (Davidsson, 2004). This term is concerned with the results and states that any activity that results in a shift in marketplace can be deemed entrepreneurship. On the contrary, other researchers have concentrated on the traits of entrepreneurs. For instance, Meredith et al. (1991) assert that entrepreneurship is the ability to recognize and analyze business potential, collect the required resources to capitalize on them and take proper measures to assure accomplishment.

Schumpeter (1934) was the one who established an early connection between the concept of innovation and economic growth. He regards entrepreneurs as innovators and claims that they contribute to economic expansion since they implement innovation. He also contemplates that the term of entrepreneur incorporates innovation, and the role of entrepreneur is underlined in the process of innovation. According to this framework, only somebody who establishes a new firm on the ground of a novel concept and approach can be considered an entrepreneur.

Prior research demonstrates that there is a favorable correlation between implementation and expansion of innovation and entrepreneurship. This has a dual impact - some argue that implementation of internal innovation, like process improvement, is the main way to be distinguished from other new companies as entrepreneurial activity (Yasuda, 2005). However, other scholars believe that acquiring new technology is the key factor (Tsai and Wang, 2008).

C. Measurement of Innovation Capability on Individual Level

When it comes to measurement, individual innovation has been measured through two major methodologies. The first measurement strategy is based on Rogers' concept (2003), who states that innovativeness is the extent to which an individual or other unit of adoption is comparatively earlier in embracing new ideas compared to the other members of a system (Rogers, 2003). This concept is related to a low degree of abstraction since it focuses on monitoring individual variations in observed conduct.

The second assessment methodology utilized in this literature review defines innovation from a behavioral standpoint, such as actualized innovativeness, innovative work conduct, or innovative performance at work (Jong & Hartog, 2007).

When it comes to the role of work environment in individual innovativeness, it is worth to analyze different approaches regarding organizational culture. The competing values framework (CVF) is one of the most popular typological approaches to understand organizational culture (Cameron & Quinn, 2006). The CVF consists of two crossing dimensions with opposing poles: internal versus external; and consistency versus flexibility. The crossing dimensions result in four quadrants reflecting four organizational culture patterns (Cameron & Quinn, 2006): Clan (concerned with internal flexibility), Hierarchy (concerned with internal consistency), Market (concerned with external steadiness), and Adhocracy (concerned with external flexibility). Patterson et al. (2009) highlighted that an organizational culture that fosters innovation is one that promotes risk taking and sharing of ideas, encourages involvement in decision making and leadership, has objectives and incentives for innovation, and offers psychological security in regard to making proposals. In support of these arguments, Raj and Srivastava (2013) discovered that the Clan, Adhocracy, and Market cultures contribute favorably to forecasting organizational innovation through organizational learning.

Based on the idea that creativity is mostly identified by steady characteristics, scientists created and tested measures to assess creativity-relevant personality traits. A more generic personality characteristic, which is positively correlated with innovative behavior, is 'open-mindedness in terms of expertise. Individuals who can be described as "highly open to experience" show greater probability to be more imaginative, intellectually curious and independent while being less likely to be afraid of changes, hence, fostering innovation (Yesil & Sozbilir, 2013).

Another aspect frequently discussed in modern literature on individual innovation is multidisciplinary. The ability to understand and think from an alternative viewpoint, for instance, from a different department of the organization, can widen the individual's point of view. This would bring a more comprehensive and multifaceted light to an idea, increasing its chances of being transformed into a prosperous innovation.

Distinctions in educational background and employment history may affect innovative performance owing to the fact that knowledge and expertise of an individual can widen an individual's opinions and facilitate them to establish a more extensive and incorporated storage of reaction possibilities from which they can derive creative ideas to tackle the issues (Hammond, 2011).

A significant and generally accepted difference in the field of motivation is the comparison between inherent motivation, which originates from the individual's participation in the assignment, and extrinsic motivation, which originates from external aspects like incentives. Both kinds of motivation have demonstrated to be positively connected to innovation (George & Zhou, 2002). Although, motivation that stems from extrinsic sources may have a negative impact on intrinsic motivation over a period of time (Hammond et al, 2011).

Along with individual elements such as personality, demographic differences and enthusiasm, the traits of the job also significantly influence the anticipation of innovation. These qualities involve complexity of the job, independence, time limitations and requirements for the role. Complicated jobs offer less routine and, as a result, can foster generation of ideas. When it comes to independence, jobs with comparatively more freedom in how, when or where work is completed may enable innovative behavior. Individuals who can be distinguished by their capability to perform creative thinking typically appreciate independence (McLean, 2005).

D. 360-Degree Feedback Method

"360° Feedback" is a procedure of gathering, quantifying, and submitting colleague observations about an individual, who can also be named a ratee, that promotes three particular data-driven results:

- Gathering of rater's interpretations of the extent to which particular behaviors are shown;
- Examination of substantial comparisons of a rater's interpretations across multiple ratees, between particular sets of raters for an individual ratee, and for ratee transformations over time;
- The generation of long-term individual, group, and/or organizational transformations in behaviors appreciated by the organization.

Although technology has shown some adverse applications (Rose, English, & Thomas, 2011), it is clear that technology has been a reason of a notable improvement in 360° Feedback implementation. To clarify, questionnaire invitations are prompt, reminders are delivered to non-responders with regularity, forgotten passwords can be effortlessly retrieved, and more raters can be registered easily. The quality of information has developed significantly as well thanks to Internet-based techniques. The rates of responses can be tracked, and deadlines prolonged if insufficient data are available to ensure anonymity, data entry errors are restrained solely to the responders, and comments are open-ended (Bracken et al., 2016). More frequently, 360° Feedback has been utilized for a bigger variety of matters besides development, such as performance management, recruiting, promotions, identification of employees with a higher potential, planning of the succession, and management of talent. For example, whereas merely 27% of companies claimed utilizing 360° Feedback for performance management in 2003 (3D Group, 2003), 10 years later this number went up to 48% (3D Group, 2013). Additional to this statistical information, 360°

Feedback has also transformed into one of the most utilized forms of measurement for both public and private organizations.

However, this methodology has shown to have a host of insufficiencies. For instance, Scullen et al. (2000) propose that there is a need for rater training which could substantially affect the findings of the surveys. Analyzing the distinctions between rater groups, Scullen et al. discovered that supervisor ratings contributed significantly to the observed variance in performance assessments, with 38%, in comparison with all other rater groups. The authors ascribed that result to a high probability of fact that supervisors are more trained and experienced in terms of assessing performance compared to the other raters.

IV. DISCUSSION

A. Challenges in measuring individual innovation capability

- Psychological factors

Scholars have undertaken various theoretical efforts to discover the challenges that exist within measurement of individual innovativeness. These attempts have identified the major variables which may be categorized into psychological and organizational factors.

Several psychological aspects have been discovered as influencing factors on individual innovation. The extensive list covers “Big Five personality traits”, which are openness to experience, neuroticism, conscientiousness, extroversion, and agreeableness (Anderson et al., 2014).

- Openness to experience shows how curious, creative and open is the individual to new ideas and experiences.
- Conscientiousness involves self-organization, responsibility and goal-orientation of the person.
- Extraversion depicts how sociable, assertive and enthusiastic is the individual.
- Agreeableness involves the cooperation, compassion and consideration.
- Neuroticism assesses emotional stability and the degree to which someone is experiencing negative feelings. High neuroticism normally means a higher tendency to anxiety, moodiness and emotional reactivity.

While these traits are relevant to innovative behavior, they also present challenges in measuring individual innovation capability. Personality is subjective and context-dependent, making standardized assessment difficult. Moreover, innovation is shaped by both internal traits and external factors, complicating efforts to isolate the role of personality alone.

Moreover, the implicit theory (Dweck, 2006) and achievement goal orientation stand out as among the most effective models for understanding motivational influences on individual behavior. The implicit theory focuses on an individual's beliefs about the nature of human traits, such as ability, personality, and morality. There are two major perspectives regarding these traits (Dweck, 2006). According to entity theorists, human traits are fixed, inherent, and biologically determined; individuals cannot significantly alter these characteristics. In contrast, incremental theorists view human attributes as flexible and capable of development through effort, learning, and experience.

Another key framework involves achievement goal orientations, which are frequently defined as the underlying motives behind one's engagement in tasks. Three primary orientations have been identified: (1) mastery, (2) performance-approach, and (3) performance-avoidance (Linnenbrink & Pintrich, 2002). Individuals with a mastery goal orientation tend to pursue tasks to develop new skills or deepen understanding. In contrast, those with a performance-approach orientation are driven by the desire to prove their competence or outperform others, while individuals with a performance-avoidance orientation are motivated primarily by the fear of appearing incompetent.

While these frameworks offer valuable insights into cognitive and motivational processes, they also present challenges in assessing individual innovation capability. Implicit theories and goal orientations are often internalized and context-dependent, making them difficult to measure accurately. Individuals may

shift between orientations based on task type, feedback, or environment, complicating the ability to draw consistent conclusions about their innovative potential. Additionally, the subjective nature of these constructs means self-reports may not always align with actual behavior, further limiting the reliability of evaluation.

- **Organizational factors**

Prior research has identified a number of organizational variables that either inhibit or promote innovativeness, such as organizational leadership, structure, strategy, resources, magnitude, and environment (Anderson et al., 2014). An organizational culture consists of employees' personal and collective ideas, assumptions, and opinion about their institution, all of which indirectly drive their behavior (Cai, 2008). The concept "culture" here relates to the common identity that differentiates one working entity from all others.

In a study by Amabile (1988), interviews with researchers in R&D identified key aspects of a work environment that help people come up with new ideas. These include:

- **Independence:** Allowing employees to feel ownership over their work and make decisions on their own.
- **Encouragement:** Managers supporting creativity by showing interest in new ideas and being attentive to employees' needs and motivations.
- **Recognition:** Giving helpful feedback and rewarding employees for their skills and professional growth.

West (2002) proposed a framework that emphasizes the unpredictable and two-part nature of innovation. According to him, innovation involves both creativity and implementation, which happen together in repeating cycles. At the beginning of each cycle, creativity plays a bigger role, followed by the implementation of innovative ideas.

West also identified four key areas that influence how innovative a group can be:

- **Nature of the tasks:** The type and complexity of the work the group is doing.
- **Group knowledge, diversity, and skills:** The variety and level of expertise within the team.
- **External demands:** Pressures or expectations from the outside environment.
- **Group processes:** How well the group works together, including communication and collaboration.

Having the clear shared group objectives enables group innovation because it facilitates concentration and generation of new ideas, which can be sorted with a higher accuracy compared to unclear group objectives. Moreover, shared group dedication is necessary in order to understand group objectives with a purpose of, consequently, promoting group innovation.

Additionally, involvement in decision making implies lower resistance to transformations, which increases the chances of innovation implementation. Being invested in the results of decision making is higher when the decision makers are fully participating and are incorporated in the process of changing and passing on information.

Furthermore, the advantages of conflicts in terms idea generation within a group in connection to creativity and innovation is highly endorsed. Task-related, not psychological or interpersonal, conflicts may cause group members to question and re-evaluate the way things are and look for an enhanced compatibility between their tasks in connection to their surroundings.

Besides, the style of leadership can impact innovative behavior of individuals. The utilization of transformational management, when a supervisor participates in creation of dedication and accountability in regard to their subordinates, has proven to relate positively to innovation owing to the increased enthusiasm and self-confidence (Tierney & Farmer, 2002).

Ultimately, ideas are not an outcome of single instances of tremendous inspiration by an individual; an idea develops and requires competition and cooperation that enforces it (Johnson, 2010). As Johnson (2010) noted, an individual who works alone in a lab formulating a radiant novel idea is an unusual case. Enabling surroundings where a thought can be freely conveyed with others will promote it to be developed and

advanced, potentially contributing to an innovation. A major part of the innovative process is the cooperation of people, to be more precise, a group. A group can be described as two or more individuals with some extent of autonomy who share a common objective or assignment.

Consequently, all the above-mentioned organizational factors have a huge implication on the capability of an individual within an organization and, in some cases, these factors may present the challenges in assessment of individuals and their capabilities.

B. Berkeley Innovation Index as a way to assess individual innovation

The Berkeley Innovation Index is both a notion and an open initiative which suggests more simplistic ways to measure innovation, but in a comprehensive manner. These techniques are based on priory published study outcomes. The methodology is also designed to encompass levels of innovation that are the following:

- Strategy and Leadership
- Innovation Culture from the Viewpoint of an Organization
- Organizational Operations and Measures across functions
- Mindset: The Innovation DNA of the People
- Tactical measures

To measure the BII scores of an individual, a questionnaire consisting of two parts is provided to the respondents. Each question falls into a separate category, and each category is connected to a particular trait that has been associated with innovation capability. The BII algorithm, calculating the scores for the characteristics, has been created using a Higher-Order Item Response Theory method, which allows to get a general understanding of individual's capability. This makes the concluded index scores statistically appropriate in accordance with contemporary algorithmic theory and design of the survey (Fred-Ojala A, Eng Larsson J, 2016).

Among other similar efforts to assess innovation, the ISO certified Innovation360 measurement or InnoQuotient can be highlighted. These two methodologies try to quantify innovation capability and performance, and they are distinct from the BII as they scrutinize innovation from a structural and organizational standpoint, while the BII focuses on the individual mentality and personality traits. These are connected to the generation of an organizational culture which enables innovation to prosper.

C. Knowledge sharing and subsequent ethical considerations

Currently, organizations increasingly concentrate on knowledge sharing, which is an integral part of knowledge management. Knowledge sharing refers to the transfer of information among people, institutions or societies. Knowledge sharing in an organization simply refers to how organization makes knowledge accessible for its employees (Ipe, 2003).

According to Lin (2007), behavior associated with knowledge sharing can be classified into two sub-behaviors namely knowledge collection and knowledge donation. These two “knowledge sharing” processes originate from the notion that there are two parties involved in knowledge sharing process, namely “knowledge carrier” (or source of knowledge) and “knowledge receiver”. Knowledge collection refers to activity of communicating and inspiring others to pass on their knowledge or intellectual resources, whereas knowledge donation is the act of sharing personal intellectual capital with others (Van Den Hooff & De Ridder, 2004).

While knowledge donation assists in establishing organizational knowledge, creating ideas grounded on awareness of new business opportunities; knowledge collection is significant for the completion of a project, as it encompasses knowledge internalization and socialization. Kamasak & Bulutlar (2010) investigated the influence of knowledge collection and knowledge donation on innovation, highlighting that knowledge collection impacts significantly on both exploration and exploitation types of innovation, while knowledge donation impacts solely on exploitative innovation. In general, gathering and

incorporating new information will result in innovativeness, but there is a necessity for further empirical research that explore the influence of knowledge sharing methods on staff's innovation and skills (Raykov, 2014).

Some researchers have summarized that there is a positive effect of ethical leadership on employee's knowledge sharing activities. Particularly, through founding an ethical organizational environment, leaders who opt for ethical management style considerably impact individual's participation in the organizational activities and promote favorable mindset toward knowledge sharing.

V. CONCLUSION

Measuring innovation capability at the individual level is a complex yet essential task for fostering creativity, entrepreneurship, and long-term organizational success. This paper has highlighted the multifaceted nature of individual innovation, shaped by psychological traits, motivational factors, work environment, and organizational culture. While traditional tools like 360-degree feedback offer value, they fall short in capturing the depth of individual innovativeness. In contrast, the Berkeley Innovation Index emerges as a more nuanced and personality-centered assessment model. Furthermore, knowledge sharing and ethical leadership play a pivotal role in enabling a culture of innovation. Ultimately, any attempt to assess individual innovation capability must adopt a flexible, inclusive, and context-sensitive framework that goes beyond surface-level behaviors to understand the mindset and conditions that drive true innovation.

REFERENCES

- [1] 3D Group. (2003). Benchmark study of North American 360-degree feedback practices (Technical Report No. 8214). Berkeley, CA: Data Driven Decisions.
- [2] Anderson, N., Potocnik, K., & Zhou, J. (2014). Innovation and creativity in organizations. *Journal of Management*, 40(5), 1297-1333
- [3] Bracken, D. W., Rose, D. S., & Church, A. H. (2016). The evolution and devolution of 360° feedback. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, 9(4), 761-794.
- [4] Cai, Y. (2008). Quantitative assessment of organizational cultures in post-merger universities. In J. Valimaa, & O. Ylijoki (Eds.), *Cultural perspective on higher education* (pp. 213-226). Dordrecht, Netherlands: Springer
- [5] Cameron, K.S. and Quinn, R.E. (2006) *Diagnosing and Changing Organisational Culture Based on Competing Values Framework*. Josey Bass, San Francisco.
- [6] Davidsson, P. (2004), *Researching Entrepreneurship*, Springer, New York, NY.
- [7] Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York, NY, USA: Random House Inc.
- [8] Fred-Ojala, A. & Eng Larsson, J. (2016). Construction of the Berkeley Innovation Index: A higher-order item response theory model approach. Master Thesis.
- [9] George, J. M., & Zhou, J. (2002). Understanding when bad moods foster creativity and good ones don't: The role of context and clarity of feelings. *Journal of Applied Psychology*, 87, 687-697.
- [10] Hammond, M. M., Neff, N. L., Farr, J. L., Schwall, A. R., & Zhao, X. (2011). Predictors of individual-level innovation at work: A meta-analysis. *Psychology of Aesthetics, Creativity, and the Arts*, 5(1), 90.
- [11] Ipe, M. (2003) 'Knowledge sharing on organizations: A conceptual framework', *Human Resource Development Review*, Vol. 2 No. 4, pp. 337-358.
- [12] Johnson, S. (2010). Where good ideas come from: The natural history of innovation.
- [13] Jong, J. P. J. De, & Hartog, D. N. D. (2007). How leaders influence employees' innovative behaviour. *European Journal of Innovation Management*, 10(1), 41-64.
- [14] Kamasak, R., & Bulutlar, F. (2010) 'The influence of knowledge sharing on innovation', *Journal of European business review*, Vol. 22 No. 3, pp. 306-317.
- [15] Lin, H. (2007) 'Knowledge sharing and firm innovation capability: an empirical study', *International Journal of Manpower*, Vol. 28 No. 3/4, pp. 315-332.
- [16] Linnenbrink, E. A., & Pintrich, P. R. (2002). Motivation as an Enabler for Academic Success. *School Psychology Review*, 31, 313-327.
- [17] Lu, L., Lin, X., & Leung, K. (2012). Goal orientation and innovative performance: The mediating roles of knowledge sharing and perceived autonomy. *Journal of Applied Social Psychology*, 42(SUPPL. 1), 180-197

- [18] McLean, L. D. (2005). Organizational culture's influence on creativity and innovation: A review of the literature and implications for human resource development. *Advances in developing human resources*, 7(2), 226-246.
- [19] Meredith G. G; Nelson, R. E. and Neck, R. A. (1991) *The Practice of Entrepreneurship*. Lagos: University Press.
- [20] Parzefall, M.-R., Seeck, H., & Leppanen, A. (2008). Employee innovativeness in organizations: A review of the antecedents. *The Finnish Journal of Business Economics*, 2(8), 165-182.
- [21] Patterson, F., Kerrin, M., Gatto-Roissard, G. and Coan, P. (2009) *Everyday Innovation: How to Enhance Innovative Working in Employees and Organizations*. NESTA, London.
- [22] Raj, R., & Srivastava, K. B. L. (2013). The mediating role of organizational learning on the relationship among organizational culture, HRM practices and innovativeness. *Management and Labour Studies*, 38(3), 201-223.
- [23] Raykov, M. (2014) 'Employer support for innovative work and employees' job satisfaction and job-related stress', *Journal of occupational health*, Vol. 56 No. 4, pp. 244-251
- [24] Rogers, E. M. (2003). *Diffusion of innovations* (3rd ed.). New York, NY, USA: The Free Press.
- [25] Rose, D. S. (2011, April). Using strategically aligned 360-degree feedback content to drive organizational change. Paper presented at the 26th Annual Conference of the Society for Industrial Organizational Psychology, Chicago IL.
- [26] Schumpeter, J. (1934), *The Theory of Economic Development*, Harvard University Press, Cambridge, MA
- [27] Scullen, S. E., Mount, M. K., & Goff, M. (2000). Understanding the latent structure of job performance ratings. *Journal of Applied Psychology*, 85, 956-970.
- [28] Shanker, R., Bhanugopan, R., van der Heijden, B. I. J. M., & Farrell, M. (2017). Organizational climate for innovation and organizational performance: The mediating effect of innovative work behavior. *Journal of Vocational Behavior*, 100, 67-77
- [29] Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45, 1137-1148.
- [30] Tsai, Y., Chern, C.S. and Wang, J. (2008) The Upper Ocean Response to a Moving Typhoon. *Journal of Oceanography*, 64, 115-130.
- [31] Van Den Hooff, B., & De Ridder, J. (2004) 'Knowledge Sharing in Context: The Influence of Organizational Commitment, Communication Climate and CMC Usage on Knowledge Sharing', *Journal of Knowledge Management*, Vol. 8 No. 6, pp. 117-130.
- [32] West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied psychology*, 51(3), 355-387.
- [33] Yasuda, T. (2005), "Firm growth, size, age and behavior in Japanese manufacturing ", *Small Business Economics*, Vol. 24 No. 1, pp. 1-15.
- [34] Yesil, S., & Sozbulir, F. (2013). An empirical investigation into the impact of personality on individual innovation behaviour in the workplace. *Procedia-Social and Behavioral Sciences*, 81, 540-551