



A Role of Thinking Styles for Innovation, A Conceptual Framework with a Critical review of Literature

Arshia Hashmi¹, Shahibuddin Ishak^{2,2}, Hazlinda Binti Hassan³

^{1,2,3}, School of Business Management, Universiti Utara Malaysia, Malaysia

¹arshiahashmee@gmail.com, ²shahibuddin@uum.edu.my, ³hazlindahassan@uum.edu.my

Abstract

The study aimed to propose a framework for elaborating the relationship of thinking styles with innovation. To fulfill this purpose, the earlier literature is consulted by the search on online data bases like emerald, J.Store, Science Direct, Springer and Taylor & Francis. The critical review of earlier literature and theories with special attention to theory of reality construction, A conceptual framework is developed. The study concludes the vital roles of different thinking patterns for innovation and invites the attention of academicians and practitioners towards this crucial aspect. At the end, the study endures the limitations and calls that the supposed relationships have the great potential to be tested empirically.

Key words: Innovation, Creativity, Thinking Styles, Conditional Styles of Thinking, Exploratory Styles of Thinking, Inquiry Styles of Thinking, Independent Styles of Thinking, Creative Styles of Thinking

1. Introduction

Innovation works as a force behind competitive advantage, success, sustainability and progress of any organization (Hyypiä & Parjanen, 2013; Isaksen & Akkermans, 2011; Zheng, Khoury, & Grobmeier, 2010). Now a day, it has become crucial for the organizations and countries for prosperity gains (Gisbert-López, Verdú-Jover, & Gómez-Gras, 2014; Gnyawali & Srivastava, 2013; Pieterse, Van Knippenberg, Schippers, & Stam, 2010; Zheng, Khoury, & Grobmeier, 2010). The researchers have put their attention to examine the intellectual and creative capabilities in work context. So various studies have examined the relationship of thinking styles with variables that involve professional work (Volpentesta, Ammirato and Sofo, 2012). The studies have found this relationship with commitment (Workman, Kahnweiler, & Bomer, 2003), adaptiveness (McIntyre, Claxton, Anselmi, & Wheatley, 2000), socialisation (Hill, Puurula, Sitko-Lutek, & Rakowska, 2000) and innovativeness (Goyal & Akhilesh, 2007). Specifically, the research studies have suggested the wide-ranging effects of thinking patterns on innovation (Dietrich and Kanso, 2010).

As far as the thinking styles are concerned, the research on individual differences shows a dire need of inquiry (Isaksen and Aerts, 2011). In the same vein, clarity about the thinking processes inducing creativity and innovation is also needed in the contemporary uncertain situations of business (Reid and de Brentani, 2010). But the studies regarding innovation lacked the cognitive elements (Paletz and Schunn, 2010). Thus, the extended investigation regarding the relationship of thinking styles with creativity and innovation is essential for gaining further insight (Volpentesta, Ammirato and Sofo, 2012; Nogueira, Almeida, Garces, Pocinho and Wechsler, 2016) or the investigation of the thinking style that differentiate organization as more innovative is required (Lejarraga and Ester Martinez-Ros, 2014). The divergent way of thinking has an ample tendency for being investigated regarding creative and innovative outcomes (Runco and Acar, 2012) and the convergent ways of thinking have also got relatively less attention of current innovation researchers (Mahr, Rindfleisch & Slotegraaf, 2015). So, the facilitating as well as the inhibiting roles of convergent and divergent kinds of thinking with connection to other factors that interplay or intervene thinking and its outcomes through different modes and sequences should be examined (Acar and Runco, 2012).

Contextually, the scarce research in the field of thinking styles was mostly done in western context. But in this globalized world, the cross-cultural and across sectors validation of the developed theories and practices is imperative (Sofo, 2005; Holtbrugge & Mohr, 2010; Jen & Lien, 2010; Kahneman, 2011; Zhu and Zhang, 2011; Mahr, Rindfleisch & Slotegraaf, 2015). As well, the phenomena of uncertainty and temporal consequences can also add questions on the previous predictions of the variables in the contemporary context. Thus, the effect of thinking styles on innovation needs examination (Hashmi, Ishak, Hassan and Ahmad, 2017).

Thus, by considering the above discussed gaps, this study aimed to develop a conceptual framework to describe the relationship of thinking styles and innovation. for this purpose, the study has firstly



introduced the key facts. Then literature is reviewed with reference to each variable. Additionally, a conceptual framework is developed. At the end, the conclusion is drawn with discussion on limitations and future research directions.

2. Literature Review

“Innovation is the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group or organization or wider society” (West & Farr, 1990). The dimensional representation of innovation represents it as suggestion of ideas and implementation of ideas (Axtell, Holman, Unsworth, Wall, Waterson and Harrington, 2000). Thinking styles can be apprehended by different perspectives as cognitive, learning, personality, mental self government and reality construction (Volpentesta, Ammirato and Sofo, 2011). Several research studies have been presented to explain the styles of thinking with different points of views (Zhang, 2002a). the theory of reality construction by Sofo (2005) is modern theory that incorporates different perspectives of thinking by elaborating the use of thinking according to different context and situations. The theory of reality construction stems from constructivist theory and takes the base from principles of mental self-government. According to this theory, individuals construct their reality through their preferences of thinking during their interactions with others in social context (Sofo, 2008). There are basic two styles, convergent and divergent styles of thinking that are underpinning the five styles introduced by this theory. Convergent thinking styles holders prefer to accept what has been told and they take the help of logics, synthesis and analysis to evaluate the facts in passive manner. While divergent thinkers raise questions, explore and imagine the facts in active manner. Individuals use both ways according to situations. The five dimensions of thinking introduced by theory of reality construction are dependency, inquiry, multiple perspectives, autonomy and imagery. Five styles of thinking that emerge from these dimensions are conditional, inquiry, exploratory, independent and creative (Sofo, 2005; 2008). An overview of these styles with a critical discussion of literature is presented in the next sections.

2.1 Conditional Style of thinking

Conditional thinkers accept the saying of others and do not raise the questions. It is a kind of convergent thinking. They have the tendency of accepting the presented information and conditions.

They totally rely on the thinking and sayings of others. Their apprehensions about facts are totally based upon the understandings of others. They feel comfort and safety in avoiding the questioning and feel it best for the given conditions. These people enjoy the benefit of taking expert advice but sometimes loose self-esteem, self-identity and confidence (Sofo, 2005; 2008).

Grivas (1996) has found in his multi method study that the thinking styles that keep harmony to be cohesive in groups can cause creative outcomes in teams. Many studies have found that the collective way of working in which the violation to status quo is not done can have positive effects in the later stages of innovation (Nakata and Sivankumar, 1996). As the harmony, consensus and group identification assures the balanced contribution of members due to just differentiation of task and it ultimately paves the way for creativity (Westwood and Low, 2003). Similarly, the conformance to rules is also required to integrate the member's effort in teams of organizations (Williams, 2004).

Conversely, the rule following is also found to be an element for hampering creativity (McFadzean, 2000; Goman, 1992). Moreover, sometimes the organizational rules do not let the individuals to communicate the ideas openly (Jacobs and Heracleous, 2005), conditional thinkers also do not express the deviation thoughts and do not question or challenge (Sofo, 2005;2008), so not challenging the existing practices can lead towards harmful consequences to innovation (Ivancevich, Lorenzi and Skinner,1997; Westwood and Low (2003). Similarly, Isaksen and Aers (2011) have also delineated that more attention towards relationships, conformity and less expression of ideas can be the possible barriers for creativity. This conformance can put the negative effects on the generation of radical innovation (Lampikoski and Emden, 1996). The empirical finding by Sofo (2005) and Volpentesta, Ammirato and Sofo (2011) have also found conditional thinking as the least preferred style by innovative entrepreneurs and creative performers respectively. This debate paves the way towards the admittance that conditional style of thinking is influential for innovation. Thus the following hypothesis is generated.

H1: Conditional thinking Style has the significant association with innovation

2.2 Inquiry Thinking Style

The inquiry style of thinking shows the individual's preference to ask questions to better comprehend the information. But as being a convergent way of thinking, the inquiry styled thinkers just ask but not



challenge the information or conditions. An inquiry thinker recognizes the reasons behind the facts and searches the details of every concept but sometimes shows reluctance to make decisions (Sofu, 2005;2008).

Inquiry explicitly provides data or information about a phenomenon from which a person can extract the creative outcomes or responses (Stobbeleir, Ashfod and Buyens, 2011). The questioning about current ways of doing things is helpful for innovation (Bledow and Frese, 2009). Ivancevich, Lorenzi and Skinner (1997) have also asserted that the people who are flexible to synthesis information can have a better role for creative work. Moreover, inquiry thinkers pay much attention to details, occasionally this attention to detail is criticized as harmful for creativity but sometimes this can provide the basis for creativity (Conti, Coon, & Amabile, 1996; Taylor & Greve, 2006; Bledow and Frese, 2009). This attention to details play the central role in the implementation stage of innovation (Miron, Erez, & Naveh, 2004).

Cameron (1993) has uncovered that curiosity and interest in information has the potential for creativity. Similarly, Dudeck and Hall (1991) have also considered the persistence, self-discipline, focus and interest to know about the problem play the essential part for creative work. Wild (1992) has also expressed the same view that time consumption to acquire the sufficient knowledge about the facts with persistence and focus has the influence over creative achievements. Moreover, Basadur and Gelade (2006) have described that the thinkers that ask questions to know the answers for better problem definition, invest the reasonable time to dig the facts and have the energy to find the meanings of problems are more successful in teams to find the solutions. Additionally, McFadzean (2000) has also considered an inquiring mind as a representative on creativity.

Like conditional thinking, inquiry style of thinking is also a convergent style. Theory of reality construction has criticized the inquiry style due to not challenging the existing norms and indecisiveness (Sofu, 2005;2008). Because these characteristics can have the negative effects on innovation (Ivancevich, Lorenzi and Skinner,1997; Westwood and Low, 2003; Isaksen and Aers, 2011). So, the inquiry style of thinking can lead towards both the positive as well as the negative effects on innovation. Thus, inquiry style has the potential to influence innovation. these arguments lead towards the following hypotheses

H2: Inquiry Style of Thinking has a significant association with innovation

2.3 Exploring Thinking Style

Exploratory thinkers search several preferences and experience many things to know about the information. Exploratory thinkers find different perspectives and show openness to face the altered feelings. They like to explore all possible sides of a problem. It is a divergent style of thinking because exploratory thinkers find all the aspects of an issue or context with discovery of several perspectives. The exploratory thinkers like complexity and develop multiple options. But on dark side, they sometimes feel confusion in the implementation of their actions (Sofu, 2005;2008).

Innovation needs exploratory way of thinking as exploratory style of challenging provides the base for new ideas to be emerged. Innovation requires the question on existing works and experimentation of the current knowledge in new ways. The openness to experience is also a precondition for innovation and exploratory thinkers do this (George and Zhou, 2001; Bledow and Frese, 2009). The open attitude by the exploratory thinkers has also got much supporting arguments as being the agent to develop innovation as William (2004) has stated that openness to experience unveils notable creativity. Other scholars have also admitted that openness to experience as the requisite of creativity (George and Zhou, 2001; Woodman et al., 1993). This creativity then ultimately cause innovation (Miron and Naveh, 2004). Because openness to experience leads towards the search for variety, tolerance for ambiguity and need for recognition, that all are associated with innovation and creativity (King, 1991). Ivancevich, Lorenzi and Skinner (1997) have also explained that people with flexibility and a tolerant attitude to ambiguity are more better for creative work. McFadzean (2000) has also suggested tolerance for uncertainty and ambiguity with inquiring mind can lead to creative solutions. Sofu (2005) has also found exploratory style of thinking as the most preferred style among innovative entrepreneurs. Similarly, Volpentesta, Ammirato and Sofu (2011) found exploratory style of thinking as relatively more preferred style for creative outputs. Thus, these arguments point towards the following hypothesis

H3: Exploratory Style of Thinking has a significant association with innovation



2.4 Independent Thinking Style

Independent thinkers confine the priority to their own thinking. They trust their own feelings, answers and views. They keep strong reasons or intuitions for accepting their own opinions. They remain attached to their own thinking and neglect the views of others. They have a good deal of confidence but sometimes they get arrogant and their enthusiasm may cause failure for them (Sofa, 2005;2008).

Independent thinkers deviate from existing practices and guide themselves by their own mind. Many studies have found that innovation is a result of deviating from accepted rules and practices. As Katz and Kahn (1978) have argued that organizations always need some individuals with spontaneous and initiative taking mindset for their survival in the continuously changing business environment. Similarly, Kanter (1988) also claimed the empowerment or autonomy of employee as an allowing condition for innovation. Nemeth and Straw (1989) have also agreed that innovation is the result of free-flowing ideas and these ideas come by deviation not the consensus. Additionally, Ivancevich, Lorenzi and Skinner (1997) have described the that independent, tolerant to ambiguity, tolerant to being isolated and self-confident people are better for the creative work. McFadzean (2000) has also considered the autonomous individuals as the potential innovators and creators.

Moreover, Feist (1998) also argued that creativity is individualistic. It can be brought by the people who are intended to be suspicious of norms, work alone, autonomous, possess high self-esteem, and like to work without reflection. Similarly, Westwood and Low (2003) have also associated the independence with creativity. Likewise, Amabile, Conti, Coon, Lazenby, & Herron (1996) have also considered autonomy and freedom as the encouragement for creativity. In addition, Sofa (2005) also found independent style of thinking as the preferred way of thinking by innovative Chinese entrepreneurs. Similarly, Volpentesta, Ammirato and Sofa (2011) have also discovered independent thinking among the more preferred thinking style for creative performance.

On the other hand, independent thinkers are also criticized by the different authors and they considered it harmful for innovation due to few reasons. As theory of reality construction has delineated that sometimes the independent thinkers become arrogant due to overconfidence and this characteristic can lead them to failure instead of accomplishment (Sofa, 2005;2008). Moreover, it

can also impart the negative effects on collaboration in team setting, as the collaborations is required to achieve any goal or target (Leonard and Strause, 1997). So that's why, some studies have found the curvilinear relationship of autonomy and innovation (Gebert, Boerner and Lanwehr, 2003). Thus the whole debate directs towards the following hypothesis.

H4: Independent style of thinking has a significant association with innovation

2.5 Creative Thinking Style

Creative thinkers develop a bigger and richer picture of any issue or problem with incorporation of wide context. These people make rich pictures during thinking process. It is also a divergent style of thinking as they develop images for their understanding of a whole scenario. These people draw pictures, images and visual aspects to understand the reality. They are imaginative in sense. But from dark side, sometimes they feel difficulty in application of ideas (Sofa, 2005;2008).

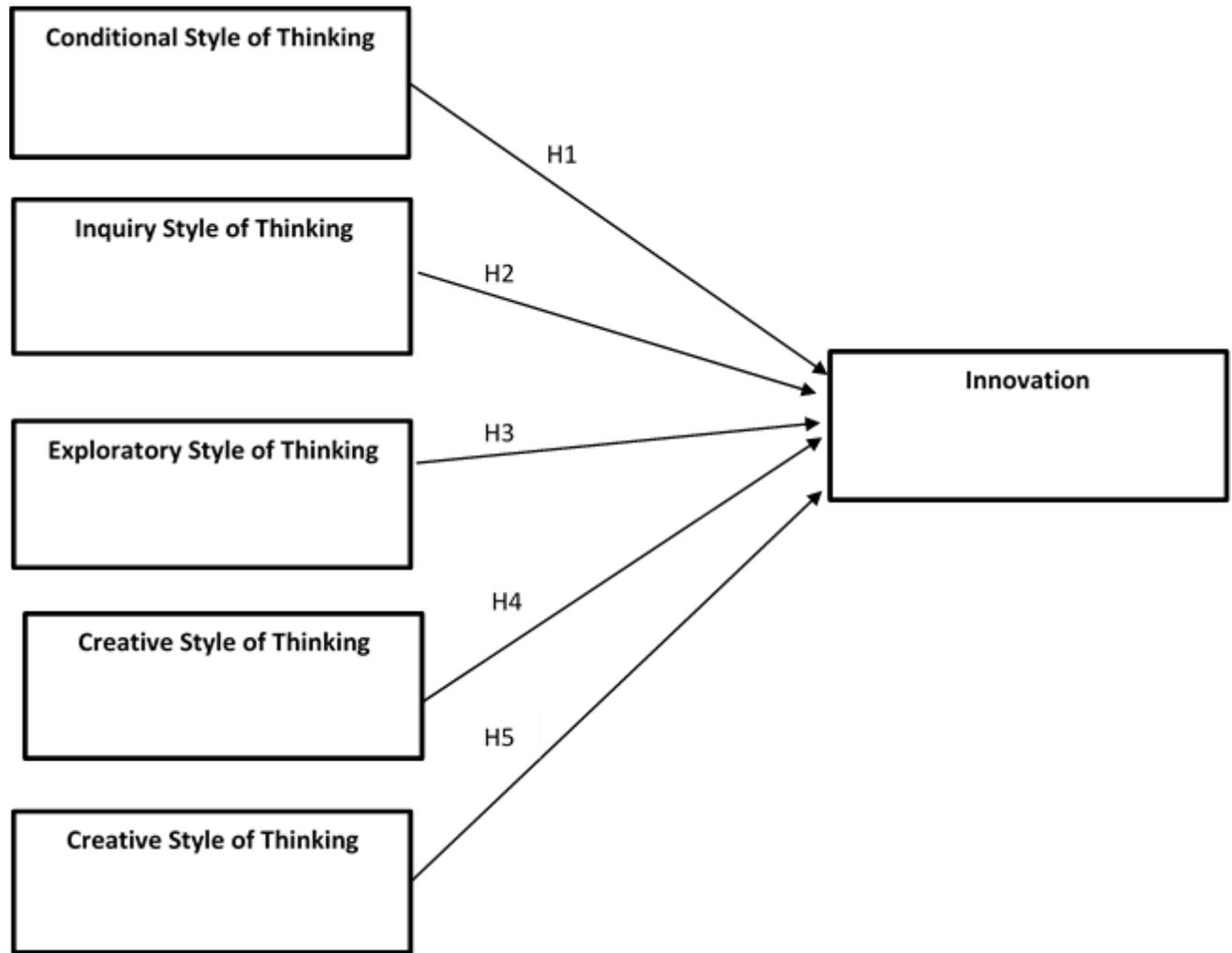
Creative thinkers use imagination, visualization and pictures for expressing their thoughts (Sofa, 2005; 2008), and Basadur and Gelade (2006) have also found the generation of an innovative product due to imagination, visualization and pictorial presentation by members in team working. Additionally, creative thinkers perceive in a holistic way (Sofa, 2005;2008) and Westwood and Low, (2003) asserted that holistic style of cognition is better for creative outcomes. In the same manner, Kaufman (2002) has also regarded holistic way of thinking as the vital for creativity. Similarly, Zhang and Sternberg (2005) have discussed that the creative or innovative problem solving requires both the analytical and creative modes of thinking but creative actions has ample requisite of holistic way of thinking. In the similar vein, many authors have admitted the high association of holistic manner of thinking with creative outcomes (e.g., Harnad, 1972; Kim and Michael, 1995; Krueger, 1976; Okabayashi and Torrance, 1984; Tan-Willman, 1981; Torrance and Reynolds, 1978).

Mahr, Rindfleisch & Slotegraaf (2015) also delineated the creative ways of thinking help the problem solvers in the time when the situations demand quick decisions with less contextual familiarity. Moreover, Volpentesta, Ammirato and Sofa (2011) have also found creative thinking as one of the most preferred style of thinking for creative outcomes. Bledow and Frese (2009) have also stressed creative thinking is the need of innovation. Additionally, the scholars have characterized the successful innovative



entrepreneurs as being creative (Schöllhammer and Kuriloff, 1979, pp. 10–14; Ivancevich et al., 1994, p. 564). Furthermore, Basadur and Robinson (1993) have also believed that the absence of creative thinking and problem-solving skills in the manager can be great hurdle for innovation. So, the above discussion leads to the following supposition

H5: Independent style of thinking has a significant association with innovation



4. Conclusion and Discussion

The study has proposed a conceptual framework in which it has been supposed that thinking styles introduced by the theory of reality construction (Sofa, 2005; 2008), namely, conditional, inquiry, exploratory, independent and creative styles of thinking have the meaningful relationship with innovation. The relationship of thinking styles and innovation has been discussed by earlier theorists and has portrayed a vivid and complex picture of this relationship. This study is among the initial studies which are discussing the relationship of innovation with thinking styles introduced by Sofa

3. Conceptual Framework

A conceptual framework has been proposed by establishing the conceptual links of the variables shown in the figure below. The proposed relationships have taken the base from earlier literature and theory of reality construction.

(2005; 2008)’s theory of reality construction with incorporation of concerned earlier literature. So, it is potentially providing a good deal of relationships that will have to be tested empirically.

Instead of this novelty, the study has certain limitations. Firstly, it is just a proposed model that requires the empirical testing. So, the future researchers should test it to confirm this propose connection of variables with quantitative proofs. Secondly, this model has not involved any mediators or moderators for this relationship. But there are several potential variables that have the tendency to affect their relationship. For example,





teamwork quality can be a potential mediator for the relationship of these thinking styles and innovation. Therefore, the future researchers can test the indirect effect of this intervening variable. Thirdly, context plays very vital roles for the confirmation of different theories. The theory of reality construction in newly developed theory so its testing in different geographical, industrial and sectorial contexts with relation to innovation and teamwork quality can facilitate the comprehensive

understanding of this theory. For this purpose, other than western context, the developing countries and emerging economies like India, Pakistan and Malaysia can be the possible regions. Moreover, the competitive dynamics and innovation ridden scenario of sectors like telecom, IT, and fast-moving consumer goods (FMCG) also require the testing of such relationships for better apprehension of their innovative requisites.

References

- Acar, S., & Runco, M. A. (2012). Creative abilities: Divergent thinking *Handbook of organizational creativity* (pp. 115-139): Elsevier.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of management journal*, 39(5), 1154-1184.
- Axtell, C. M., Holman, D. J., Unsworth, K. L., Wall, T. D., Waterson, P. E., & Harrington, E. (2000). Shopfloor innovation: Facilitating the suggestion and implementation of ideas. *Journal of Occupational and Organizational Psychology*, 73(3), 265-285.
- Basadur, M., & Gelade, G. A. (2006). The role of knowledge management in the innovation process. *Creativity and Innovation Management*, 15(1), 45-62.
- Basadur, M., & Robinson, S. (1993). The new creative thinking skills needed for total quality management to become fact, not just philosophy. *American Behavioral Scientist*, 37(1), 121-138.
- Bledow, R., Frese, M., Anderson, N., Erez, M., & Farr, J. (2009). A dialectic perspective on innovation: Conflicting demands, multiple pathways, and ambidexterity. *Industrial and Organizational Psychology*, 2(3), 305-337.
- Conti, R., Coon, H., & Amabile, T. M. (1996). Evidence to support the componential model of creativity: Secondary analyses of three studies. *Creativity Research Journal*, 9(4), 385-389.
- De Stobbeleir, K. E., Ashford, S. J., & Buyens, D. (2011). Self-regulation of creativity at work: The role of feedback-seeking behavior in creative performance. *Academy of management journal*, 54(4), 811-831.
- Dietrich, A., & Kanso, R. (2010). A review of EEG, ERP, and neuroimaging studies of creativity and insight. *Psychological bulletin*, 136(5), 822.
- Dudek, S. Z., & Hall, W. B. (1991). Personality consistency: Eminent architects 25 years later. *Creativity Research Journal*, 4(3), 213-231.
- Feist, G. J., & Gorman, M. E. (1998). The psychology of science: Review and integration of a nascent discipline. *Review of general psychology*, 2(1), 3.
- Gelade, G. (1995). Creative style and divergent production. *The Journal of Creative Behavior*, 29(1), 36-53.
- George, J. M., & Zhou, J. (2001). When openness to experience and conscientiousness are related to creative behavior: an interactional approach. *Journal of Applied psychology*, 86(3), 513.
- Gisbert-López, M., Verdú-Jover, A., & Gómez-Gras, J. (2014). The moderating effect of relationship conflict on the creative climate–innovation association: the case of traditional sectors in Spain. *The International Journal of Human Resource Management*, 25(1), 47-67.
- Gnyawali, D. R., & Srivastava, M. K. (2013). Complementary effects of clusters and networks on firm innovation: A conceptual model. *Journal of Engineering and Technology Management*, 30(1), 1-20.
- Goyal, A., & Akhilesh, K. (2007). Interplay among innovativeness, cognitive intelligence, emotional intelligence and social capital of work teams. *Team Performance Management: An International Journal*, 13(7/8), 206-226.
- Harnad, S. R. (1972). Creativity, lateral saccades and the nondominant hemisphere. *Perceptual and Motor Skills*, 34(2), 653-654.
- Hashmi, A., Ishak, S., Hassan, H. B., & Ahmad, M. A. (2017). A Conceptual Framework for Describing the Innovation in Teams. *International Journal of Economic Research*, 14(14 (Part II)), 59-72.
- Hill, J., Puurula, A., Sitko-Lutek, A., & Rakowska, A. (2000). Cognitive style and socialisation: an exploration of learned sources of style in Finland, Poland and the UK. *Educational Psychology*, 20(3), 285-305.



- Holtbrügge, D., & Mohr, A. T. (2010). Cultural determinants of learning style preferences. *Academy of Management Learning & Education*, 9(4), 622-637.
- Hyypiä, M., & Parjanen, S. (2013). Boosting creativity with transformational leadership in fuzzy front-end innovation processes. *Interdisciplinary Journal of Information, Knowledge and Management*, 8, 21-41.
- Ibérico Nogueira, S., Almeida, L., Garcês, S., Pocinho, M., & Wechsler, S. (2016). The style troika model: A structural model of the thinking and creating styles scale. *The Journal of Creative Behavior*, 50(4), 333-346.
- Isaksen, S. G., & Aerts, W. S. (2011). Linking problem-solving style and creative organizational climate: An exploratory interactionist study. *IJCPS-International Journal of Creativity and Problem Solving*, 21(2), 7.
- Isaksen, S. G., & Akkermans, H. J. (2011). Creative climate: A leadership lever for innovation. *The Journal of Creative Behavior*, 45(3), 161-187.
- Ivancevich, J. M., Lorenzi, P., & Skinner, S. J. (1997). *Management: Quality and competitiveness*: McGraw-Hill/Irwin.
- Jacobs, C. D., & Heracleous, L. T. (2005). Answers for questions to come: reflective dialogue as an enabler of strategic innovation. *Journal of Organizational Change Management*, 18(4), 338-352.
- Jen, C.-H., & Lien, Y.-W. (2010). What is the source of cultural differences?--Examining the influence of thinking style on the attribution process. *Acta Psychologica*, 133(2), 154-162.
- Kahneman, D., Thinking, F., & Slow, F. (2011). *Straus and Giroux*. New York.
- Kanter, R. M. (1988). When a thousand flowers bloom: Structural, collective, and social conditions for innovation in organization. In B. Staw & L.L. Cummings (Eds.), *Research in Organizational Behavior* (vol. 10, pp. 169-211). Greenwich, CT: JAI Press.
- Katz, D., & Kahn, R. L. (1978). *The social psychology of organizations* (Vol. 2): Wiley New York.
- Kaufman, J. C. (2002). Dissecting the golden goose: Components of studying creative writers. *Communication Research Journal*, 14(1), 27-40.
- Kim, J., & Michael, W. B. (1995). The relationship of creativity measures to school achievement and to preferred learning and thinking style in a sample of Korean high school students. *Educational and Psychological Measurement*, 55(1), 60-74.
- King, N. (1990). Innovation at work: The research literature.
- Krueger, T. H. (1976). *Visual imagery in problem-solving and scientific creativity*.
- Kuriloff, A., & Schollhammer, H. (1979). The nature of entrepreneurship. *Entrepreneurship and Small Business Management*, 7-27.
- Lampikoski, K., & Emden, J. B. (1996). *Igniting innovation: Inspiring organizations by managing creativity*: John Wiley & Son Ltd.
- Lejarraga, J., & Martinez-Ros, E. (2014). Size, R&D productivity and decision styles. *Small Business Economics*, 42(3), 643-662.
- Leonard, D., & Straus, S. (1997). Putting your company's whole brain to work. *Harvard Business Review*, 75, 110-122.
- Mahr, D., Rindfleisch, A., & Slotegraaf, R. J. (2015). Enhancing crowdsourcing success: the role of creative and deliberate problem-solving styles. *Customer Needs and Solutions*, 2(3), 209-221.
- McFadzean, E. (2000). Techniques to enhance creative thinking. *Team Performance Management: An International Journal*, 6(3/4), 62-72.
- McIntyre, R. P., Claxton, R. P., Anselmi, K., & Wheatley, E. W. (2000). Cognitive style as an antecedent to adaptiveness, customer orientation, and self-perceived selling performance. *Journal of Business and Psychology*, 15(2), 179-196.
- Miron, E., Erez, M., & Naveh, E. (2004). Do personal characteristics and cultural values that promote innovation, quality, and efficiency compete or complement each other? *Journal of Organizational Behavior*, 25(2), 175-199.
- Miron, E. M. E., & Naveh, E. (2004). Do personal characteristics and cultural values that promote innovation, quality and efficiency compete or complement each other? *Journal of Organizational Behavior*, 25(2), 175-199.
- Nakata, C., & Sivakumar, K. (1996). National culture and new product development: An integrative review. *The Journal of Marketing*, 61-72.



- Nemeth, C. J., & Staw, B. M. (1989). The tradeoffs of social control and innovation in groups and organizations *Advances in experimental social psychology* (Vol. 22, pp. 175-210): Elsevier.
- Okabayashi, H., & Torrance, E. P. (1984). Role of style of learning and thinking and self directed learning readiness in the achievement of gifted students. *Journal of learning disabilities*, 17(2), 104-106.
- Paletz, S. B., & Schunn, C. D. (2010). A social-cognitive framework of multidisciplinary team innovation. *Topics in Cognitive Science*, 2(1), 73-95.
- Pieterse, A. N., Van Knippenberg, D., Schippers, M., & Stam, D. (2010). Transformational and transactional leadership and innovative behavior: The moderating role of psychological empowerment. *Journal of Organizational Behavior*, 31(4), 609-623.
- Reid, S. E., & de Brentani, U. (2010). Market vision and market visioning competence: Impacts on early performance for radically-new, high-tech products. *Journal of Product Innovation Management*, 27(4), 500-518.
- Runco, M. A., & Acar, S. (2012). Divergent thinking as an indicator of creative potential. *Creativity Research Journal*, 24(1), 66-75.
- Sofo, F. (2005). Thinking styles of modern Chinese leaders: independence and exploration in an historically conditional China. *Australian Journal of Adult Learning*, 45(3), 304.
- Sofo, F. (2008). Differences of degree or differences in kind? A comparative analysis of thinking styles. *International Journal of Interdisciplinary Social Sciences*, 3(1), 293-301.
- TAN-WILLMAN, C. (1981). Cerebral hemispheric specialization of academically gifted and nongifted male and female adolescents. *The Journal of Creative Behavior*, 15(4), 276-277.
- Taylor, A., & Greve, H. R. (2006). Superman or the fantastic four? Knowledge combination and experience in innovative teams. *Academy of management journal*, 49(4), 723-740.
- Torrance, E. P., & Reynolds, C. R. (1978). Images of the future of gifted adolescents: Effects of alienation and specialized cerebral functioning. *Gifted Child Quarterly*, 22(1), 40-54.
- Volpentesta, A. P., Ammirato, S., & Sofo, F. (2011). *Thinking style and collaborative design learning: An empirical investigation*. Paper presented at the Computer Supported Cooperative Work in Design (CSCWD), 2011 15th International Conference on.
- Volpentesta, A. P., Ammirato, S., & Sofo, F. (2012). Collaborative design learning and thinking style awareness. *International Journal of Engineering Education*, 28(4), 948.
- West, M. A., & Farr, J. L. (1990). Innovation and creativity at work: Psychological and Organizational Strategies. NY: John Wiley & Sons, 265-267.
- Westwood, R., & Low, D. R. (2003). The multicultural muse: Culture, creativity and innovation. *International journal of cross cultural management*, 3(2), 235-259.
- Wild, J. J. (1992). The origin of soft tissue ultrasonic echoing and early instrumental application to clinical medicine. *Inventive minds: Creativity in technology*, 115-141.
- Williams, S. D. (2004). Personality, attitude, and leader influences on divergent thinking and creativity in organizations. *European Journal of Innovation Management*, 7(3), 187-204.
- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of management review*, 18(2), 293-321.
- Workman, M., Kahnweiler, W., & Bommer, W. (2003). The effects of cognitive style and media richness on commitment to telework and virtual teams. *Journal of Vocational Behavior*, 63(2), 199-219.
- Zhang, L.-F. (2002). Thinking styles and modes of thinking: Implications for education and research. *The Journal of Psychology*, 136(3), 245-261.
- Zhang, L.-f., & Sternberg, R. J. (2005). A threefold model of intellectual styles. *Educational psychology review*, 17(1), 1-53.
- Zheng, W., Khoury, A. E., & Grobmeier, C. (2010). How do leadership and context matter in R&D team innovation?—A multiple case study. *Human Resource Development International*, 13(3), 265-283.
- Zhu, C., & Zhang, L. F. (2011). Thinking styles and conceptions of creativity among university students. *Educational Psychology*, 31(3), 361-375.