KIU Journal of Social Sciences Copyright©2020
Kampala International University ISSN: *2413-9580*; 6(4): 155–166

Employee Creativity and Workplace Technological Innovation on Problem-Solving in Twenty-First Century Organizations

ESAU NANFWANG MWANTU, MUNDI PATRICK SUPJI
University of Jos, Nigeria

IGBINIGIE AIMUAMWOSA
University of Liverpool, United Kingdom

ODUNAYO OLUWASANMI OLUWAFEMI,
Police Academy, Kano, Nigeria

YAKUBU IBRAHIM ITSE
Plateau State University, Bokkos, Nigeria

Abstract. The ultimate goal of every organization is for its employees to acquire the ability to solve complex problems and maintain high level of efficiency and effectiveness in the workplace to have maximum output and high level of productivity. To achieve these goals, the creative ability of individual employees within the organization and their adjustment to innovations, especially technological innovations is required. This study examined the influence of workplace creativity and technological innovations on problem solving ability of employees in service organizations in Nigeria. Respondents were N120 (52 males and 68 females). Age range of participants were 20-41 years with a mean of 1.57 and standard deviation of -.645, respectively. Three hypotheses were tested using the two-way Analysis of Variance (ANOVA) statistics and the results of the analysis revealed a significant influence of creativity on problem solving ability of the participant's $F(1,119) = 108.602$, $p < 0.05$. Improved technological innovation also has significant influence on problem solving ability of the participants' $F(1, 119) = 66.322$, $p < 0.05$. Creativity and technological innovation have significant interactive effects on employees' ability to solve complex organizational problems effectively $F(1, 119) = 12.980$, $p < 0.05$. Recommendations were that employee workplace creativity and organizational technological innovation should be encouraged not only in Nigerian organizations but in all 21st century organizations for efficient and effective customer service and the achievement of maximum production output by the organizations.

Keywords: Employee, Workplace Creativity, Organization, Technological Innovation, Problem-Solving Ability

1. Introduction

The ultimate goal of every organization in this 21st century is for its employees to acquire the ability to solve complex problems and maintain high level of efficiency and effectiveness in the workplace to have maximum output, and high level of productivity. The achievement of these goals depend solely on the creative ability of individual employees within the organization and their adjustment to innovations most especially, technological innovations.

Over the years, several studies have been conducted on Nigeria's service organizations to determine their level of performance, efficiency and effectiveness (Agbola, 2006; Akinboye, 2004; Mwantu, Agbo & Ngwama, 2015). Some of these studies have concluded that Nigerian service organizations have generally become dysfunctional since the country's independence to the present time; the main reasons being the organizations' inability to utilize creative employees, poor adjustment to technological innovations, lack of or poor implementation of creativity strategies by the organizations to improve their products and services among others.

Creativity is considered highly important for all organizations and the society at large to maintain economic status and achieve better standard of living for citizens (Craft, 2003; Runco, 2004). This makes creativity an important element most especially in an employee's work life. Creativity has impact on our lives even when we are unaware of it. Great thinkers such as Albert Einstein, Herman Hollerith, Frank Lloyd, Ben Franklin and most recently Bill Gates and Mark Zukerberg through their creativity and ingenuity have developed ideas that have shaped our lives today and forever.

The definition of creativity is however elusive. Although most researchers in the social and applied sciences particularly psychology agree upon such aspects of creativity as originality, appropriateness, and the production of works of value to society, they have had difficulty agreeing upon appropriate instruments and methods in operationalizing this concept (Kreitner & Kinicki, 2001; Sternberg, 2006). Sternberg and Lubart (1999) however attempted to define creativity as the ability to produce work that is both novel and appropriate. Novelty here means that the work is original, distinct or unexpected. Runco (2004) defines creativity in terms of cognitive processes that lead to an original and adaptive insight, idea or solution. Akinboye (2004) further sees creativity as a tool that propels organizations, catapults careers, and generates potent growth and viable outcomes. Standler (1998) however contrasted creativity and intelligence. According to him, "intelligence is the ability to learn and to think, while creativity is the ability to do things that have not been done before". A tacit implication of this statement is that creative people are intelligent but the converse is not always the case. According to Simonton (2000), "creativity is one of the ways that human beings display optimal functionality".

In view of the importance of creativity in enabling human beings to display optimal functionality, Al-Madadha and Koufopoulos (2014), posited that in order to compete with other countries of the world, it is important for all workers including Nigerian workers to be creative. The only reason why any organization would be willing to pay an employee twice as much as equally competent people is if that employee can add creativity and innovation on a grand scale to sheer competence. The researchers further submit that being creative means being able to change with time, being flexible, innovative and coming up with better ways to produce and market products and services.

Creativity is not the innate quality of only a few people; it is present in everyone what matters, is the amount that is present in each human being. Creativity can be learned, practiced and developed by the use of proven techniques which enhance and stimulate creative abilities, ideas and outcomes (Amabile, 2004). Creativity helps people to move out of their normal problem-solving mode mainly to enable them to consider a wide range of alternatives and to improve productivity and quality of work. Creativity is thus constructed as a learned ability that enables us to define new relationships between concepts and events which seemed apparently unconnected before and which results in a new entity of knowledge (Pot, Totterdill, & Dhondt, 2017); and knowledge and information are the basis of creativity.

Boden (1994) distinguishes three forms of creativity namely combinational, exploratory and transformational creativity. Where combinational creativity is exhibited in fashioning old ideas in new ways and illustrated in the simplest form. It means bringing together

old ideas with new ones in order to produce something better. Exploratory creativity is exhibited in finding the possibilities of generative systems; and transformational creativity is exhibited in changing a generative system by rejecting one or more of its constitutive rules and regulations and replacing it with new ones.

Innovation is derived from the Latin word "nodus" meaning "new". Tornatzky and Fleischer (1990) defined innovation as the introduction of something new, a new idea, method or device. In general, innovation is defined as "any idea, practice, or material artifact" that is adopted by an individual, group, or organization for the purpose of change (Moqbel, 2012). Workplace innovation is known by several names including individual innovation (Bunce & West, 1995), and innovative behavior (Janssen, 2004). In particular, innovative behavior is defined by Janssen (2004) as: "all individual actions directed at the generation, introduction and application of beneficial novelty at any organizational level which might include the development of new products, ideas or technologies to work processes intended to significantly enhance their efficiency and effectiveness" (p: 285).

Great ideas and innovative behavior are byproducts of human minds. In this particular study, the word innovation refers to technological innovation as opposed to other forms of innovation. Among the variety of definitions, technological innovation is considered as the process which is science and technology based. The process of innovation includes several factors affecting both private and public organizations not only in Nigeria but the world over. Innovation can be seen as the introduction of something new to the business world as well as a process (Janssen, 2000). It means to make something better or to improve on the quality of an object or product.

Technological innovation can be viewed as broader introduction of a new process or "meta system" of an organization (Karagozoglu, 1989; Twiss, 1980). Nieto (2004) in his contribution refers to the term "technology" to mean the stock of knowledge about the set of all industrial techniques available at a given time. Technology is the combination of theoretical and practical knowledge, skills and artifacts that can be used to develop products and services as well as their production and delivery systems.

Thus, technological innovation as used in this study is a process which transforms ideas that manifests in the development of new products and organizational strategies. Methe (1992) and Greis and Fischer (2005) all describe technological innovations as strategies, concepts and changes geared towards higher output. Technological innovation according to Shilling (2005) is now the most important driver of competitive success between and amongst organizations in this 21st century. For today's organizations to be properly developed and survive the competiveness of other organizations, employees and the organization alike must be creative and innovative in using their ingenuity to solve practical problems of the organization.

Proper use of creativity and technological innovations will enhance adequate problem-solving not only in the developed countries but also among the developing ones. Problem-solving is the mental process that involves discovering, analyzing and solving problems. The ultimate goal of problem-solving is to overcome obstacles and find solutions that best resolve a pending issue. The best strategy for solving a problem depends largely on the unique situation and prevailing circumstances. In some cases, people are better off learning everything they can about the problem and then using factual knowledge to come up with possible solutions. In other instances, creativity and insights are the best options. In this case, they start by "trial and error" learning; testing and evaluating their creativity, innovativeness and ingenuity before achieving success to reach the goal.

The concepts of creativity and innovation are not only useful to technologists and engineers, scientists and social scientists but also to the educationists as well. For example, while

psychologists use the two concepts to explain the cognitive and innovative abilities of people in different settings including the industry and organizations (Klahr & Simon, 1999); the educationists particularly the educational technologists use these terms to describe both simple and sophisticated learning materials used to aid teaching and the learning process of their pupils and students (Erickson & Curl, 1972).

Problem-solving describes the process of using generic and ad-hoc methods in an orderly manner, for finding solutions to problems. Today, the problem-solving technique is used in solving complex problems of society such as in artificial intelligence and robotics, computer science, engineering, agriculture, mathematics, medicine, and so on. The problem-solving technique is also used in psychology and is defined as "the state or desire for reaching a definite goal from a present condition that either is not directly moving towards the goal, is far from it, or needs more complex logic to find a missing description of conditions or steps towards the goal". In psychology too, 'problem-solving' is the concluding part of a larger process that also include problem finding and problem shaping. Considered the most complex of all intellectual functions, problem-solving has been defined as a higher-order cognitive process that requires the modulation and control of more routine of fundamental skills. Thus, for us to be able to solve a problem, we must pass through these three stages namely problem finding, problem shaping, and finally problem-solving, respectively.

Problem-solving has two main domains namely 'mathematical problem-solving' and 'personal problem-solving' (Coolican, 2009; Erickson & Curl, 1972; Newell & Simon, 1972). Furthermore, problem-solving occurs when moving from a given state to a desired goal state usually needed for either living organisms or an artificial intelligence system (Simon, 1975). Literature on the concept of problem-solving indicates that problem-solving accompanied the very beginning of human evolution and especially the history of mathematics (Coolican, 2009).

Human problem-solving processes have also been studied within psychology over the past one hundred years by renowned psychologists such as Wilhelm Wunt, John B. Watson, B.F. Skinner and Ivan P. Pavlov (Passer, Smith, Holt, Bremner, Sutherland & Vliek, 2009; Schultz & Schultz, 2005). The methods of studying problem-solving in the field of psychology include introspection, behaviourism, simulation, computer modeling and experimentation (Coolican, 2009; Passer, et al, 2009; Schulzt & Schulzt, 2005).

Literature on the topic reveals that the early work of Gestalt psychologists such as Karl Drucker (1954) in Germany marked the formal beginning of the concept of problem-solving. Drucker kick-started the study of this concept through his seminal work titled "The Psychology of Productive Thinking". Later this experimental work continued through the 1960s and 70s with research conducted on relatively simple but novel laboratory tasks of problem-solving. Based on clearly defined 'optimal solutions' it was now, possible for researchers to trace participants' steps in problem-solving processes. The best known and most impressive example of this line of research is the work by Allen Newell and Herbert Simon (Newell & Simon, 1972). Other scholars had shown that the principle of decomposition improves the ability of the problem-solver to make good judgment (Burton, 1990a; Kelman, 2005).

In light of the above stated literature, several theories that are related to workplace creativity, technological innovations and problem-solving in organizations have been proposed. These include the componential theory of creativity (Amabile, 1988), cognitive evaluation theory (Shalley, 1995; Shalley & Perry-Smith, 2001), the psychodynamic approach (Freud, 1901, 1954), and the humanistic approach (Adler, 1935; Rank, 1932). Others are the social shaping approach (Williams & Edge, 1996), the economic technological innovation approach (Rosenberg, 1994) and technology and business strategy approach (Utterback, 1994).

In the area of problem-solving the standard problem-solving theory (Newell, Shaw &

Simon, 1958), the interactive problem-solving model (Kelman, 2000) and the extended problem-solving theory (Choi, 2004) are popular among many others not mentioned here. These theories and models have all played significant roles in explaining the three concepts of creativity, technological innovation and problem-solving of people in general and those of organizational members in particular; and were therefore used in this study.

1.2 Aims and Objectives of the Study

From the above stated literature this study had two main aims; one, to examine how employees' cognitive creativity and creative skills in the workplace could affect their performance and problem-solving ability and two, to examine how technological innovations can be used as essential tool to solve complex organizational problems in Nigerian organizations. The specific objectives of this study therefore included:

- To assess the influence of workplace creativity and creative skills on employee problem-solving ability in service organizations in Nigeria.
- To determine the role of organizational technological innovations on employees' problem-solving ability in service organizations in Nigeria.
- To find out if employee workplace creativity and creative skills and organizational technological innovations have significant interaction effects on their problem-solving ability in service organizations in Nigeria.

From the foregone statements, it implies that this study attempted to fill a gap in the literature of organizational behavior studies by providing additional information that can be useful to researchers and managers of Nigerian organizations in particular and managers of the 21st century organizations in general. This study was particularly necessary in Nigeria in order to evaluate the possibility of the influence of these variables on problem-solving ability of employees in Nigerian organizations and how such employees can be further motivated in the development and use of the variables.

Studies on employee workplace creativity and organizational technological innovations with respect to its role on problem-solving have been conducted mainly by researchers in countries of the world that have attained the status of developed nations such as Germany, United States of America, Canada, United Kingdom, China and Japan; but much less in organizations in developing countries particularly Nigeria. Therefore, the significance of this study cannot be over emphasized in view of the awareness it will create to managers and chief executives of organizations in Nigeria; and the primary data it will provide for future studies on the topic.

The study therefore hypothesized that:

- There would be a significant effect of workplace creativity on employees' organizational problem-solving ability in service organizations in Nigeria.
- Improved organizational technological innovations would have significant effect on employees' level of problem-solving in service organizations in Nigeria.
- Employee creativity and improved organizational technological innovations would have significant interactive effects on employee problem-solving ability in service organizations in Nigeria.

2. Method

2.1 Design

The study used the independent group design conducted in a 2x2 (employee workplace creativity x technological innovation) factorial design. The two independent variables – employee workplace creativity (low and high) and technological innovation (low and high), were utilized to measure the dependent variable of employee problem-solving ability.

2.2 Participants and Setting

In order to achieve the above stated objectives and further test the hypotheses of the study, the investigation was conducted in three service

organizations in Jos- Plateau State, namely, the Nigerian Postal Agency, Plateau State Revenue Commission, and MTN Nigeria. One hundred and forty questionnaires were administered to the respondents and a total of 120 were returned and found useful. Participants consisted of 52 males (43.3%) and 68 females (56.7%). Age ranges of participants were from 20-41 years with a mean of 1.57 and standard deviation of -.645, respectively. All participants were resident in Jos Metropolis at the time of the study.

2.3 Measures

Two instruments were used for collecting data in this study and these are the creativity and problem-solving scale and technological innovation and problem-solving scale. The two scales measured workplace creativity and problem-solving and technological innovation and problem-solving, respectively.

2.4 Creativity and Problem-solving Scale

This scale was developed by Diliello and Houghton (2006). Diliello and Houghton first used the scale in a study conducted at the United States Department of Defense (DOD). To use the scale, the DOD acknowledged the importance of leveraging the creativity of its workforce members to enforce change within the military and supporting organizations. Thus, the Creativity and Problem-solving Scale was developed to measure and examine the construct validity of creative potential and practiced creativity using an exploratory factor analysis (EFA) along with a confirmatory factor analysis (CFA) using structural equation modeling technique which also examines the construct relative to organizational motivated support for creativity.

The Creativity and Problem-solving Scale is divided into three well validated sub-scales namely, the Creativity Potential sub-scale, Practiced Creativity sub-scale and Organizational Motivated Support Creativity sub-scale, respectively. All items of the scale were measured using a five point Likert-like scale ranging from strongly disagree to strongly agree.

2.5 Technological Innovation and Problem-solving Scale

This scale was developed by the European Educational Technological Standards (NETS, 2007) to assess educational technological standards of respondents and was adopted for the purpose of this study. The scale development process involves item pool development through literature search, expert opinion and pilot data collection from development sample. Other processes adopted in the development of the scale included exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) procedures all geared towards ensuring the development of a standard instrument.

2.6 Procedure

Participants were contacted in their respective offices to sought their consent for the study after due permission had been granted by the office of protocols in charge of administrative staff. All respondents were given the space time of an hour to respond to the questionnaire items and were encouraged to give their honest opinions on all items of the questionnaire administered to them. All participants were thanked after the questionnaires were collected back and were assured of confidentiality of the information supplied since data collected were meant for research purposes only.

2.7 Data Analysis

Statistical analyses were carried out by means of the SPSS version 21.0 software. Descriptive statistics were used to analyze socio-demographic variables such as gender, age, marital status, number of line and managerial staff, educational qualifications of respondents, and type of employment. Cronbach alphas were used to determine the reliability of the measuring instruments. Two-way analysis of variance regression (ANOVA) was adopted for the inferential statistical analysis.

3. Results

The results are presented in the summary tables below. Table one indicates the mean and

standard deviations of the demographic variables used in this study. For example, the mean for gender is 1.57, SD = 0.498; Mean for respondents' job title is 2.29, SD = 0.456; qualification is 1.53, SD = 0.501; marital status is 1.28, SD = 0.448; type of employment is 1.87, SD = 0.341; and age is 1.57, SD = 0.645, respectively.

Table1: Mean and Standard Deviations of Demographic Variables of Respondents

	Gender	**Age**	**Marital Status**	**Job title**	**Qualifications**	**Type of Employment**
Valid	120	120	120	120	120	120
Missing	0	0	0	0	0	0
Mean	1.57	1.57	1.28	2.29	1.53	1.87
Standard Deviations	0.498	0.645	0.448	0.456	0.501	0.341

In table two: test of between subject effects indicates a significant influence of creativity on problem-solving ability of the participants' $F(1,119) = 108.602$, $p < 0.05$.

Table 2: Test of Between-Subject Effects of Workplace Creativity on Problem-solving

Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	51.709	13	3.978	108.602	.000
Intercept	283.930	1	283.930	7752.147	.000
Workplace Creativity & Problem-solving	2.926	1	2.926	79.900	.000
Error	3.882	106	0.037		
Total	485.000	120			
Corrected Total	55.592	119			

Table 3: Indicates significant effect of improved technological innovation on employee problem-solving in Nigerian service organizations $F(1, 119) = 66.322$, $p < 0.05$.

Table 3: Regression ANOVA of Technological Innovation on Employee Problem-solving

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	0.909	0.827	0.815	0.553

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	162.358	8	20.295	66.322	0.000
Residual	33.967	111	0.306		
Total	196.325	119			

Table 4: indicates that employee creativity and technological innovation have significant interactive effects on employees' ability to solve complex organizational problems effectively $F(1, 119) = 12.980$, $p<0.05$.

Table 4: Test of Between Subjects Effects for Interactive Effects of Creativity and Technological Innovation on Problem-solving

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	85.302	14	6.093	50.919	.000
Intercept	6.2000	1	6.200	51.812	.000
Creativity*technological innovation*Problem-solving	1.553	1	1.553	12.980	.000
Error	12.564	105	0.120		
Total	644.000	120			
Corrected Total	97.867	119			

4. Discussion of Findings

This research has three hypotheses that were tested with their results as presented above. Concerning hypothesis one which states that there would be significant effect of workplace creativity on employees' problem-solving ability in service organizations in Nigeria; the result showed that the creative potentials of individuals in the organization is a sure means to solving complex problems in the organization. The study assumed that employee creativity in the workplace would enable them to generate novel ideas that will help them solve complex problems they encounter in their daily work schedules.

Supporting this finding, Tidd, Bessant and Pavitt (2005), in a management research on organizational innovation and creativity confirmed that organizations that meet the creativity and innovation challenge out-perform their competitors in terms of market share, profitability, growth rate and market capitalization. Creative employees in innovative organizations are better able to mobilize their knowledge, skills and experiences to successfully create new products, services and ways of getting things done faster, better and cheaper. Although creativity is innovation's precursor, both are key issues for organizational growth.

Other studies have found that motivation of workplace creativity by the management of the organization has a significant effect on the performance level of employees and their organizational problem-solving ability. Factors such as employee recognition for outstanding performance, token economy, end of year bonuses, steps elevation or promotion and provision of merit awards, among others can boost creativity and innovativeness in individual employees. More so, in order to understand employees' creativity, we must focus on their capabilities, skills and motivations. The literature on creativity has often embraced a multifaceted approach to understanding creative abilities, skills and motivation, and individuals' personal characteristics for creativity.

Hypothesis two stated that improved technological innovations would have significant effect on employees' level of problem-solving in service organizations in Nigeria. The result as presented in the analysis, shows that improved organizational technological innovation has significant effect on employees' problem-solving ability in the organizations investigated. Technological innovations and technology itself is a necessary tool for solving complex problems including complex organizational problems especially in this digital age. Therefore, making use of improved workplace technological innovations such as the Internet, mobile devices, videos and other up-to-date resources have been very instrumental in solving complex organizational problems including adverts, customers' service and market coverage (Moqbel, 2012, Mwantu et al, 2015).

Bessant and Tidd (2007) and Tidd and Bessant (2011) in their study of aspects of the innovation process concluded that technological innovation is increasingly seen as a key strategic priority for organizational success due to its potentials to create a sustainable competitive advantage. In a related study, Barsh, Capozzi and Davidson (2008) further found that 70% of today's

organizations' senior executives identified innovation as one of their top three drivers for improving organizational performance. Innovative organizations are better able to mobilize the knowledge, skills and experiences of their employees and successfully create new products, services and ways of getting things done faster, better and cheaper.

Hypothesis three states that employee creativity and improved organizational technological innovations would have significant interactive effects on employee organizational problem-solving ability in service organizations in Nigeria. The result of the data that were analyzed to test this particular hypothesis showed that employee creativity and improved organizational technological innovations did have significant interactive effects on employee organizational problem-solving ability in the organizations studied.

Previous studies (Agbola, 2006; Amabile, 1999; Hinton, 1970; Shokan 2005; Woodman, Sawyer and Griffen, 1993) have all supported this result. For example, Woodman et al (1993) and Amabile (1999) in their respective studies have concluded that creativity and innovation are critical competencies for 21st Century organizations seeking the lead in business or seeking to adapt to change. Amabile further described individual creativity as an essential component for facilitating organizational technological innovation. To this scholar, creativity generally refers to the implementation of novel ideas in an organizational setting that is imperative for long-term organizational success and survival. Given the common themes and definitions of creativity and technological innovation, it appears that the value of the two variables vis-à-vis their influence on employee organizational problem-solving may relate to an ability to harvest yet appropriate ideas in order to increase organizational efficiency, improve effectiveness, and ultimately solve complex problems in the organization.

Hinton (1968) further noted important characteristic distinctions between creative potential, practiced creativity and actual creative output that are germane to innovative persons. It is true that if the individual's creative output is inhibited by the environment, then the individual will not be able to utilize his or her creative potentials and the inability to utilize creative potentials will almost likely go unnoticed because there will be nothing to measure or observe. Hinton described creative potential as the creative capacity, creative skills and abilities that an individual possesses.

According to Kim, Hon and Crant (2009), Rycroft and Kash (1999) and Bullinger (1999), technology exerts significant influence on the ability to innovate and is viewed both as a major source of competitive advantage and a source of new product innovation. Often times production firms and organizations in general experience problems in this area, which is caused by lack of capital expenditure on technology and insufficient expertise by employees especially in terms of their innovative capacity to use available technology to its maximum level for such outcomes.

Today, a variety of technological innovations including ICT products are increasingly being used in organizations in developed, developing and less developed countries of the world. This is in response to increased sophistication of the customers' needs and greater competition emanating from increased globalization of the 21st century organizations. For example, available studies suggest that ICT has become diffused into and has become widely adopted in most Nigerian organizations including the ones that were investigated (Agbola, 2006; Akinboye, 2004).

In conclusion, this study investigated the influence of workplace creativity and technological innovation on employees' organizational problem-solving ability and found that the two variables (employee creativity and technological innovation) are important tools for organizational problem-solving and success. Therefore, employee workplace creativity and organizational technological innovation should be encouraged not only in Nigerian organizations but in all 21st century organizations in order to offer efficient and effective customer services and to achieve

maximum production output by the organizations.

References

Agbola, A. A. (2006). Information Technology, bank automation and worker attitude in Nigerian Banks. *Journal of Social Sciences*, 3 (4), 217-225.

Akinboye, J. O. (2004). Creativity of innovation success. Ibadan: University Press

Al-Madadha, A. and Koufopoulos, D. N. (2014). Linking an integrated approach of empowerment to employee creativity. *European Scientific Journal*, 2, 1857-7881.

Amabile, T. M. (1988). Motivation and Creativity: Effects of motivational orientation on Creative writers. *Journal of Personality and Social Psychology*, 47, 393-399.

Amabile, T. M., Burnside, R. M. and Gryskiewez, S. S. (1998). User's manual for keys assessing the climate for creativity. Greensboro, NC; Centre for Creativity Press.

Bansudur, M., Runcor, M. A. and Vega, L. A. (2004). Understanding how creative thinking skills, attitude and behaviour work together: A casual process model. *Journal of Creative Behaviour*, 34, 77-100.

Barsh, J., Capozzi, M. M. and Davidson, J. (2008). Leadership and motivation: *The MC Kinsey*

Quarterly, 1, 37-47.

Bessant, J. and Tidd, J. (2007). Innovation and Entrepreneurship. USA: John Wiley & Sons Ltd.

Brown, W. B. and Karagozoglu, N. (1989). A Systems Model of Technological innovation. *IEEB Transactions on Engineering Management*, 36 (1), 11-16.

Bullinger, H. J. (1999). Turbulent times require creative thinking: New European concepts in production management. *International Journal of Production Economics*, 66, 9-27.

Bunce, D. and West, M. A. (1996). Stress Management and Innovation Interventions at Work. *Human Relations*, 49, 209-232.

Burton, J. W. (1990a). Conflict: Human Needs Theory. New York: St. Martin's Press.

Choi, J. N. (2004). Individual and Contextual Predictors of Creative Performance: The mediating role of psychological processes. *Creative Research Journal*, 16, 187-199.

Coolican, H. (2009). Research Methods and Statistics in Psychology. London: Hodder Education and Hachette, UK Company.

Craft, A. (2003). The limits to creativity in education: Dilemmas for the educator. *British Journal of Educational Studies*, 51 (2), 113-127.

Depietro, R., Wiarda, E., and Fleischer, M. (1990). The Context for Change: Organization, technology and environment. In L. G. Tornatzky and M. Fleischer (Eds.), The processes of technological innovation (pp 151-175). Lexington: Lexington Press.

Dilellio, T. C. and Houghton, J. D. (2006). Maximizing organizational leadership capacity for the future: Toward a model of self-leadership, innovation and creativity. *Journal of Managerial Psychology*, 21. 319-337.

Drucker, K. (1954). Problem-solving, and decision –making activities of the group: The practice of management. New York: Harper & Bros.

Erikson, C. W. H. and Curl, D. (1972). Fundamentals of teaching with audiovisual technology, 2nd Edition. USA: Macmillian Publishers.

Freud, S. (1901). The psychopathology of everyday life. In the standard edition of the complete psychological works of Sigmund Freud (Vol 6), J. Strachey (Ed. & Trans), London: Hogarth Press.

Freud, S. (1954). The Origins of Psychoanalysis. In M. Bonaparte, A Freud, & E. Kris (Eds.), Letters to Wilhelm Fliess, drafts and notes; 1887-1902. New York: Basil Books.

Hinton, B. L. (1968). A model for the study of creative problem-solving. *Journal of Creative Behaviour*, 2, 133-142.

Hinton, B. L. (1970). Personality variables and creative potential. *Journal of Creative Behaviour*, 3, 483-503.

Janssen, F. (2004). The age of innovation: Making business creativity a competence not a coincidence. London, Printice Hall.

Kelman, H. C. (2005). "Interactive problem solving in the Israeli-Palestinian Case: Past Contributions and Present Challenges." In R.J. Fisher (ed.), *Paving the Way: Contributions of Interactive Conflict Resolution to Peace-making*. New York: Lexington Books, 41-42.

Kelman, H. C. (2015). The development of interactive problem solving: In John Burton's footsteps. *Political Psychology (Internet)*, 36 (2),243-262.

Kim, T., Hon, A. H. Y. and Crant, M. L. (2009). Proactive personality, employee creativity, and newcomer outcomes: A longitudinal study. *Journal of Business and Psychology*, 24 (1), 93-103.

Klahr, D. and Simon, H. A. (1999). Studies of scientific discovery: Complementary approaches and convergent findings. *Psychological Bulletin*, 125, 524-543.

Kleyson, R. F. and Street, C. T. (2001). Toward a multidimensional measure of individual innovative behaviour. *Journal of Intellectual Capital*, 2 (3), 284-296.

Kreitner, R. and Kinicki, A. (2001). Organizational behaviour, 5th Edition. USA; Irwin Mc Graw-Hill.

Methe, D. T. (1992). The influence of technology and demand factors on firm size and industrial structure in the DRAM market. Research Policy, 21, 11-25.

Moqbel, M. (2012). The effect of the use of social networking sites in the workplace on job performance (Doctoral Dissertation) Texas A & M International University.

Mwantu, E. N., Agbo, P. O. and Ngwama, J. C. (2015). Work motivation and job satisfaction as predictors of employee organizational commitment in public service organizations. *Continental Journal of Social Sciences*, 8 (1), 11-21.

Newell, A., Shaw, J. C., and Simon, H. A. (1958). Elements of a theory of human problem solving. *Psychological Review*, 65 (3), 151-166.

Newell, A. and Simon, H. A. (1980). Human problem solving. Eaglewood Cliffs, NJ: Prentice Hall.

Nieto, M. (2004). 'Basic propositions for the study of the technological innovation process in the firm'. *European Journal of Innovation Management*, 7 (4), 314-324.

Passer, M., Smith, R., Holt, N., Bremner, A., Sutherland, E. and Vliek, M. (2009). Psychology: The science of mind and behaviour. Berkshire, McGraw-Hill Education.

Pot, F. D., Totterdill, P. and Dhondt, S. (2017). European policy on workplace innovation. UK: Springer International Publishing AG.

Rank, O. (1932). Dictionary of creativity terms, concepts, theories and findings in creativity research 2007. Retrieved from http://creativity.net.slovara.rul// humanisticapproach.html.

Rosenberg, N. (1994). Exploring the black box: Technology, economics, and history. UK: Cambridge University Press.

Runco, M. A. (2004). Creativity theories. Annual Review of Psychology, 55, 657-687. Retrieved from https://doi.org/10.1146/annurev.psych.55.09092.1415.

Rycroft, R. W. and Kash, D. E. (1999). Managing complex networks: Keys to 21st Century innovation success. *Research and Technology Management*, 42 (3), 13-18.

Schultz, D. P. and Schultz, S. E. (2005). Theories of personality, 8th Edition. Australia:
Thomson Wadsworth.

Shalley, C. E. (1995). Effects of coaction, expected evaluation, and goal setting on creativity and productivity. *Academy of Management Journal*, 38 (2), 483-503.

Shalley, C. E.and Perry-Smith, J. E. (2001). Effects of social-psychological factors on creative performance: The role of informational and controlling expected

evaluation and modeling experience. *Organizational Behaviour and Human Decision Process*, 84 (1), 1-22.

Simon, H. A. and Newell, A. (1972). Human problem solving: The state of the theory in 1970. *American Psychologist*, 26 (2), 145-159.

Simonton, D. K. (2000). Creativity: Cognitive, Personal, Developmental and Social Aspects. *American Psychologist*, 55 (1), 151-158.

Sternberg, R. J. and Lubart, T. I. (1999). The Concept of Creativity, Prospects and Paradigms. In R. J. Sternberg (Ed.), Handbook of creativity (pp 16-31), UK: Cambridge University Press.

Stock, G. N., Greis, N. P. and Fischer, W. A. (2002). Firm size and dynamic technological innovation in the computer modem industry. *Technovation*, 22 (9), 537-549.

Tidd, J. and Pavitt, K. (2005). Managing innovation: Integrating technological market and organizational change,3rd Edition. USA: John Wiley and Sons.

Tierney, P. and Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45, 1137-1148.

Twiss, B. C. (1980). Managing Technological Innovation, 2nd Edition. London: Longman.

Utterback, J. (1994). Mastering the dynamics of innovation. Boston, MA.: Harvard Business School Press.

Woodman, R. W., Sawyer, J. E., and Griffen, R. W. (1993). Towards a theory of organizational creativity. *Academy of Management Journal*, 8, 293-321.