Radosław WOLNIAK
Politechnika Śląska
Wydział Organizacji i Zarządzania
rwolniak@polsl.pl

Michalene Eva GREBSKI
Northampton Community College – Monroe Campus
mgrebski@northampton.edu

INNOVATIVENESS AND CREATIVITY OF THE WORKFORCE AS FACTORS STIMULATING ECONOMIC GROWTH IN MODERN ECONOMIES

Abstract. The paper describes an analysis of the current educational processes from the perspective of encouraging or discouraging innovativeness and creativity. The paper also analyzes the factors either promoting or limiting innovativeness and creativity in the workplace and everyday life. The conclusions include suggestions for creating an innovativeness friendly atmosphere which tolerates failures and celebrates successes. This type of culture and environment promote economic growth.

Keywords: innovativeness, creativity, workforce, economic growth, organizational culture

1. Introduction

The first modern research and development corporation was organized and managed by Thomas Edison. It resulted in 2,332 patents worldwide. Edison was very successful in finding innovative and creative scientists and creating an atmosphere which promoted innovativeness and creativity. Modern economies are knowledge-based economies. Innovativeness and creativity are critical in creating intellectual property in knowledge-based economies.

Intellectual property is the most valuable asset of modern enterprises[1]. To generate profit, modern enterprises need to "work smarter not harder". In modern economies, traditional mass production is not profitable anymore and it is being outsourced to countries with lower labor costs. Therefore, innovativeness and creativity of the workforce are more important than ever[2].

[1] Knop L., Olko S.: Cooperation in clusters and networks – creativity and innovativeness challenges: an introduction, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 109, 2017, s. 5-7; Pichlak M.: Innowacje ekologiczne jako źródło przewagi konkurencyjnej przedsiębiorstw, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z. 102, 2017, s. 303-317; Przybylska E.: Potencjalne źródła innowacji w branży TSL, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z. 101, 2017, s. 401-410; Olko S.: The impact of the networks and clusters in cultural and creative industries on regional innovation ecosystem - analysis of the selected cases in Europe, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z. 109, 2017, s. 25-42; Osika G.: Innowacje społeczne jako wsparcie dla inteligentnych specjalizacji – uwarunkowania komunikacyjne. Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z. 95, 2016, s. 369-381; Kozubek R.: Innowacje społecznie odpowiedzialne a kompetencje miękkie pracowników przedsiębiorstwa, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 95, 2016, s. 225-236; Pichlak M.: Innowacyjność nowych produktów – ujęcie wielowymiarowe, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 89, 2016, s. 397-407; Michalak A.: Inteligentna specjalizacja jako koncepcja wdrażania polityki inteligentnego rozwoju, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 96, 2016, s. 123-132; Kochmańska A.: Kompetencje miękkie w innowacyjnym przedsiębiorstwie, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 95, 2016, s. 189-199; Szwajca D.: Macierz aspiracji innowacyjnych jako narzędzie zarządzania portfelem innowacji w przedsiębiorstwie, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 95, 2016, s. 322-333; Dolińska-Weryńska D., Weryński P.: Percepcja innowacji wśród przedsiębiorców z sektora MŚP w województwie śląskim, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 95, 2016, s. 103-117; Knop L., Brzóska J.: Rola innowacji w tworzeniu wartości przez modele biznesu, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 99, 2016, s. 213-232; Jonek-Kowalska I.: The sources of risk in the process of implementing technological innovations, w: Mezinárodní Masarykova konference pro doktorandy a mladé vědecké pracovníky. MMK 2011. Sbornik Příspěvků, Hradec Králové, Česká republika 12.-16.12.2011. [Dokument elektroniczny]. Hradec Kralove : Magnanimitas, 2011, s. 280-290; Jonek-Kowalska I.: Współdziałanie w formie aliansu strategicznego jako metoda wspierania działalności innowacyjnej, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 55, 2011, s. 81-95.

[2] Olkiewicz M., Bober B., Wolniak R.: Innowacje w przemyśle farmaceutycznym jako determinanta procesu kształtowania jakości życia, „Przegląd Chemiczny", nr. 11, 2017, s. 2199-2201; Wolniak R.: Analiza relacji pomiędzy wskaźnikiem innowacyjności a nasyceniem kraju certyfikatami ISO 9001, ISO 14001 oraz ISO/TS 16949, Kwartalnik Organizacja i Kierowanie, nr 2, 2017, s. 139-150; Krzemień E., Wolniak R.: Innowacyjność polskiej gospodarki na tle krajów Unii Europejskiej, „Kwartalnik Organizacja i Zarządzanie", nr 4, 2016, s. 155-165; Wolniak R.: Metody i narzędzia Lean Production i ich rola w kształtowaniu innowacji w przemyśle, [w:] monografii „Innowacje w zarządzaniu i inżynierii produkcji" [red:] R. Knosala, Oficyna Wydawnicza Polskiego Towarzystwa Zarządzania Produkcją, Opole 2013, s. 524-534.

2. Fostering Innovativeness and Creativity in the Educational Process

When we are talking about innovativeness[3], we must be mindful that our perceptions may have a great deal of influence[4]. Old innovations can be new to those who were not exposed to them before. We can adapt old ideas and make them new or better suited for the time and situation. This is part of being creative. Being innovative is not always about creating something new, but rather using the information already given and putting the pieces of the puzzle together in new ways[5]. Something cannot be created from nothing. It is up to individuals to find what works best and use or alter it to fit the needs of the problem presented.

Attributes of innovations includes five characteristics:

- Relative advantage.
- Compatibility.
- Complexity.
- Testability.
- Observability[6].

Innovativeness promotes learning. Teachers should have the ability to create a proper learning environment for learning to be effective. This is highlighted by a mixture of factors needed to promote innovativeness in an education setting. These influences[7] are as follows:

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[3] Wolniak R.: The role of QFD method in creating innovation, „Systemy Wspomagania Inżynierii Produkcji", z. 3, 2016, s. 127-134; Wolniak R.: Relationship between selected lean management tools and innovations, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie, z 75, 2014, s. 157-266; Wolniak R., Skotnicka-Zasadzień B.: The use of value stream mapping to introduction of organizational innovation in industry, „Metalurgija", vol 53., iss. 4, 2014, s. 709-712; Wolniak R.: Innovation in the context of economic situation in the EU countries, "Zeszyty Naukowe Akademia Morska w Szczecinie", nr 24 2010, s.141-147; Wolniak R., Sędek A.: Using QFD method for the ecological designing of products and services, "Quality and Quantity", vol 43, nr 4, 2009, s. 695-701; Wolniak R., Grebski M. E.: Functioning of the business incubator center on Gliwice, „Zeszyty Naukowe Politechniki Ślaskiej. Seria Organizacja i Zarządzanie", nr 105, 2017.

[4] Sahin (2006) Detailed Review of Rogers' Diffusion of Innovation Theory and Educational Technology – Related Studies Based on Rogers' Theory, The Turkish Online Journal of Educational Technology, vol. 5 Issue 2, Article 3, 2006.

[5] Michna A., Kmieciak R.: Orientacja rynkowa a zarządzanie wiedzą w kontekście rozwoju i wzrostu małych i średnich przedsiębiorstw, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie", nr 60, 2012, s. 203-216; Brzóska J.: W kierunku wzrostu wartości organizacji Wybrane aplikacje BSC, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie", nr 60, 2012, s. 27-47; Rydarowska-Kurzbauer J.: Uwarunkowania innowacyjności wybranych krajów Europy Środkowo-Wschodniej, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie", nr 96, 2016, s. 155-165; Rydarowska-Kurzbauer J.: Innowacyjność wybranych krajów Europy Środkowo-Wschodniej, Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacja i Zarządzanie", nr 86, 2016, s. 93-101.

[6] Olkiewicz M., Bober B., Wolniak R.: Innowacje w przemyśle farmaceutycznym jako determinanta procesu kształtowania jakości życia, „Przegląd Chemiczny", nr. 11, 2017, s. 2199-2201; Wolniak R.: Analiza relacji pomiędzy wskaźnikiem innowacyjności a nasyceniem kraju certyfikatami ISO 9001, ISO 14001 oraz ISO / TS 16949, Kwartalnik Organizacja i Kierowanie, nr 2, 2017, s. 139-150; Krzemień E., Wolniak R.: Innowacyjność polskiej gospodarki na tle krajów Unii Europejskiej, „Kwartalnik Organizacja i Zarządzanie", nr 4, 2016, s. 155-165; Wolniak R.: Metody i narzędzia Lean Production i ich rola w kształtowaniu innowacji w przemyśle, [w:] monografii „Innowacje w zarządzaniu i inżynierii produkcji" [red:] R. Knosala, Oficyna Wydawnicza Polskiego Towarzystwa Zarządzania Produkcją, Opole 2013, s. 524-534

- Educational methodology.

How does the teacher feel about learning and teaching?

- Technological tools.

Is the teacher using technology?

- Ways to present its contents.

How is the teacher presenting the material?

- Ways that teachers and students think and act.

What is the class environment?

Innovativeness by the teacher can lead to innovative learning by the student. Using technology can be helpful.

Lateral Thinking vs. Linear Thinking

Lateral thinking can help promote creativity. Linear thinking can hinder creativity. Linear thinking is looking at a problem head on, but with lateral thinking you look at the problem in multiple ways. Lateral thinking gives insight into the problem and abstract thinking[8]. Lateral thinking can be taught in schools. How we assess students on their comprehension can go beyond rote memorization. Students can be taught creative critical thinking. Lateral problem-solving skills can be a key element to plant the seeds of innovativeness in children.

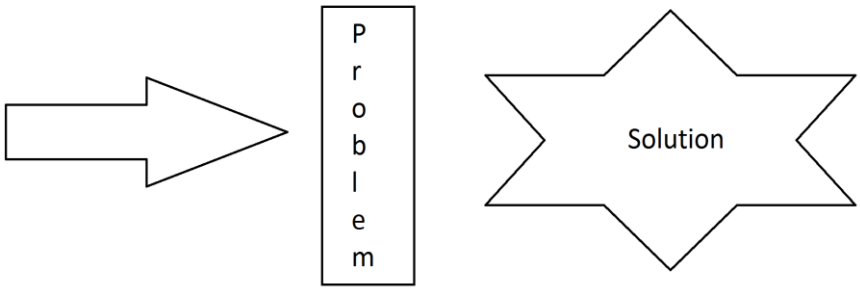

Fig. 1. Linear problem solving

[7] Sahin (2006) Detailed Review of Rogers' Diffusion of Innovation Theory and Educational Technology – Related Studies Based on Rogers' Theory, The Turkish Online Journal of Educational Technology, vol. 5 Issue 2, Article 3, 2006.

[8] Expert Group Report, Innovation and Creativity in Education and Training in the EU Member States Fostering Creative Learning and Supporting Innovative Teaching, Rethinking Education, 2012.

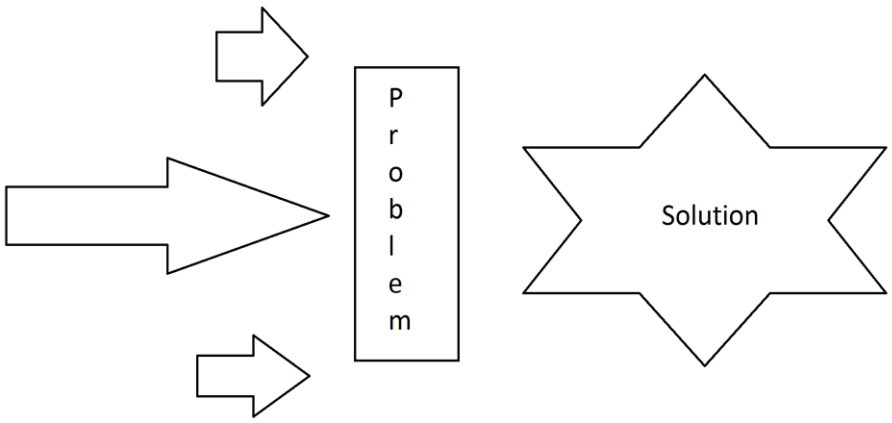

Fig. 2. Lateral problem solving

The Expert Group Report[9] from the European Union (EU) states that innovativeness and creativity "should be viewed as the interaction between the person and the socio-cultural surrounding". The Report defines creativity as any act, idea or product that changes the existing domain or that transforms an existing domain into a new one. It is important to be able to cultivate this capacity in individuals, groups, communities and organizations". Studies show that the potential to be creative is higher in individuals who show multi-intelligence (more than one type of intelligence) than those who simply excel in one area. This can support the need to understand and teach lateral problem solving. People who have knowledge in more than one area can more easily look at problems from different angles[10].

In Europe, there is little training on the higher education level for entrepreneurial skills. A program to the contrary, Youth in Action, has projects implementing new learning strategies into its problem-solving. The goal is to help its participants find new ways for looking at problems to find solutions for current problems.

Non-formal learning in Youth in Action, an EU-based program, and the resulting projects has provided positive benefits in various ways. The following benefits were reported as being "new" to the learner:[11]

- Being involved in the organization of the project.
- Participating in special exercises and activities during the project.
- Reflecting on the learning (in discussions).
- Listening to and giving presentations.

[9] Expert Group Report, Innovation and Creativity in Education and Training in the EU Member States Fostering Creative Learning and Supporting Innovative Teaching, Rethinking Education, 2012.
[10] https://ec.europa.eu/youth/success-stories/youth-in-action_en [DOA: 07.01.2017].
[11] Expert Group Report, Innovation and Creativity in Education and Training in the EU Member States Fostering Creative Learning and Supporting Innovative Teaching, Rethinking Education, 2012.

Junior Achievement is a similar program in the United States (US). Junior Achievement is the largest organization in the United States "dedicated to giving young people the knowledge and skills that they need to own their economic success, plan for their futures, and make smart academic and/or economic choices. Junior Achievement's program in the core content areas of work readiness, entrepreneurship and financial literacy ignite the spark in young people to experience and realize the opportunities related to the realities of work and life in the 21st century"[12].

Many educational institutions either secondary or post-secondary are trying to enhance innovativeness in their curriculum. Northampton Community College (US) is promoting the "flip-classroom" approach where students are learning by doing research before the class. The classroom is being used for discussion and exchange of opinions. Penn State Hazleton (US) is using "multidisciplinary team-building projects"[13] to emphasis and foster innovativeness. Penn State Hazleton students from different major are working together on special projects helping startup companies to become successful. Students have the opportunity to work hand-in-hand with inventors and entrepreneurs. During that process, students develop skills promoting innovativeness. Students also have opportunities to feel the excitement of working on something new and innovative. The inventors and entrepreneurs become role models for the students. "Education is lighting the fire and not filling up the bucket" (William Butler Yeats).

3. Fostering Innovativeness and Creativity in the Educational Process

There are certain conditions which are needed for innovativeness and creativity to thrive. The culture to promote innovativeness and creativity needs to be forward thinking, diverse and supportive towards risk-taking. The collaboration between employees of different ranks and from different departments needs to be free without any barriers or reservations. Innovativeness and creativity needs to be unleashed by removing the barriers and obstacles of communication. Innovativeness is about people. Enterprises which manage to create and foster a culture of innovativeness and creativity always gain a competitive edge and experience financial success. A culture of innovativeness and creativity is not very common, and it is easier to achieve at companies with the following characteristics.

- Small-size companies (up to 25 employees).
- Younger well-educated workforce.
- Presence of a role model for innovativeness and creativity.

[12] https://www.juniorachievement.org/web/ja-usa/home [DOA:2017].

[13] Grebski, W., Multidisciplinary Entrepreneurial Team Building Project, International Conference on Engineering Education (ICEE), Gliwice, Poland, July 26, 2005.

- Tolerance for failure (job security)
- Company under the direct management of the owner or founder
- Flexible work hours
- Frequent coffee breaks (to allow for discussion and interaction among employees)
- Appreciation for teamwork (Every employee feels like a valuable member of the team.)
- Rewarding and celebrating successes (profit sharing option for employees)
- Tolerance and appreciation for diversity (religious, ethnic, cultural, etc.)
- Interaction by employees after work
- Positive reinforcement of creative behaviors
- Family-like atmosphere (The company will help employees in crisis situations.).

The United Kingdom's former prime minister, Tony Blair, said, "Creativity and innovation are at the heart of successful business." Studies have shown[14] that a company's performance is correlated with the extent in which the company implements its employees' suggestions.

By being in the frontline of company activities, employees know better what the customers want as well as the inefficiencies that are hindering the company's progress. Many modern enterprises often become decentralized and employees are expected to work without close supervision. Close supervision hinders employees' creativity and innovativeness. Employees are expected to be self-starting and change-oriented. They need to be long-term goal-oriented and persistent. Very often creativity and innovativeness are used interchangeably. Some researchers use the terminology of creativity for generating new ideas and innovativeness to describe the implementation of those ideas. The factors stimulating creativity and innovativeness can be divided into two categories. Those categories are employee characteristic factors and company environment factors. The employee characteristic factors are as follows:

- Knowledge, skills and abilities (Job-related knowledge, content knowledge and innovation abilities).
- Dispositional influence (Proactive personality style, high self-esteem, etc.).
- Self-motivation (Intrinsic motivation, role-based motivation, externally-based motivation).

The factors related to the company's practices and work environment are as follows:

- Job autonomy and company complexity (Employees are more creative if they are self-managed and have autonomy. Autonomy assists in using creativity and innovativeness while increasing the employees' responsibility).
- Collegial communication and teamwork.

[14] Unsworth, Kerrie L. and Parker, Sharon. Proactivity and Innovation: Promoting a New Workforce for the New Workplace. In: Holman, David and Wall, Toby D. and Clegg, Chris W. and Sparrow, Paul and Howard, Ann, (eds.) The New Workplace: A Guide to the Human Impact of Modern Working Practices. Chichester: John Wiley & Sons, 2003, pp. 175-196.

- Diversity among team members.
- Supportive non-controlling leadership.
- Psychological safety (There is a feeling of openness and trust among employees).
- Organizational policies and structure creating a climate of innovativeness.
- Presence of lateral interaction.
- Cross-functional teams breaking down barriers.
- Constantly changing the work design to create autonomous and challenging jobs.
- Introduction of self-managing teams.
- Non-anxiety provoking workload management .
- Easy access to high quality information for decision making.
- Promoting inter-team and inter-department communication and cross-functional collaboration.
- Organization-wide culture of trust and transparency allowing for risk taking.
- Clear and transparent procedures for new employee recruitment and training.

4. Factors Limiting Innovativeness and Creativity in the Workplace

A culture of innovativeness and creativity is very difficult to achieve in government-managed and public institutions due to a hierarchy, rigid procedures and low tolerance for failure. The characteristics of companies not supportive of innovativeness and creativity are as follows:

- Structured hierarchy and chain of command.
- Rigid work hours.
- Limited coffee breaks and interaction among employees.
- Rigidly-defined job responsibilities.
- No profit-sharing option for employees.
- Punishment for mistakes.
- Negative reinforcement.
- Lack of teamwork (Coworkers are not encouraged to communicate).
- Lack of employee interaction after work hours.
- Lack of transparency (a feeling that some employees are favored by management).
- Formal evaluation by every employee by their supervisor.
- Lack of company interest in employees' personal problems[15].

[15] Choi, J.N., Anderson, T.A., Veillette, A. Contextual Inhibitors of Employee Creativity in Organizations. Group & Organization Management. Vol. 34, No. 3, June 2009, pp. 330-357.

Most researchers focus on identifying factors promoting creativity and innovativeness. Very few researchers focus on the factors hindering creativity even though they are equally or more important.

Negative experiences in the workplace have stronger effects than positive experiences of the same magnitude. Negative components have a greater impact on outcomes than positive components. Positive-negative asymmetry is existing in every work environment. Many positive effects of supported leader behavior can be eliminated by one negative behavior. The main factors hindering creativity and innovativeness are as follows:

- Routinization and standardization of employees' tasks.
- Unsupportive organizational climate.
- Aversive and close monitoring leadership (Intimidating subordinates, dispensing punishment, judgmental employee evaluation).
- Mistrust and incompetence of coworkers (Feeling that colleagues are opportunists and not trustworthy).
- Lack of training needed to generate creative ability (Creativity and innovativeness is increasingly seen as a competence which can be improved or developed through training in most individuals).
- Work overload leading to anxiety.

5. Conclusions

For many professions, innovativeness and creativity are major assets. Therefore, we must foster its development and nurture its presents. We need to raise and teach children and teach our students while nurturing creativity. This will have a great positive impact on them both socially and economically. It will also foster economic growth.

However, some professions are more structured and require their employees to act within recommended guidelines. In those positions thinking out of the box and risk taking is counterproductive and discouraged. Innovativeness and creativity are always associated with a risk factor. For example: A pilot in a passenger airline, a nurse in the hospital, emergency response personnel, etc. are trained to strictly follow certain procedures. However, in those professions innovative suggestions related to changing the procedure are always welcomed and considered. Therefore, innovativeness and creativity can be considered major assets for every possible position.

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