

Creative Confidence in Secondary Education: A Systematic Review

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Abstract: This article is predicated on a systematic review of educational examination and academic literature referring to creative confidence as a part and a great influential tool for secondary education. Regardless of the dynamic work of global design company 'IDEO' that constructs positive influence through design thinking in 13 areas besides learning and education, there is a lack of practice on creative confidence in didactic learning of the secondary school. To explore the procedure of how secondary school students' learning may be organized by using creative confidence, scientific articles on design thinking and creative confidence in the classroom have been explored, analysed, and compared. A particular emphasis was put on competency-based learning as a base of any educational curriculum in the 21st century. There was evidence of the influence for the usage of creative confidence as a part of a didactic approach with secondary school students. It was stated that design thinking goes next to creative confidence as a part of it rather than a different term. Further on the findings of this article may be used to adapt creative confidence in both a lesson plan and curriculum of a specific subject.

Keywords: secondary education, creative confidence, design thinking, competencies, TRIZ

Introduction

During the process of acquiring secondary education sometimes the goal for students' academic achievements is ranked more and higher rather than students' skills and abilities preferred for the future life. Certainly, by the help of the competence-based approach in education of School2030 where the transversal skills are a part of the implemented changes, teachers still struggle to provide all the necessary activities to develop the skills for students' future success in higher education and life itself. Secondary school students ought to make choices and comprehend the consequences as an influential part of helping themselves grow and develop (Polirstok, 2017; School2030. A vision of a student n.d.).

According to the list of ten targets provided in Sustainable Development Goal 4 (UNESCO, 2017), one of the objectives that shall successfully promote lifelong learning opportunities for students from early childhood to secondary education by 2030 are: effective learning environments, education for sustainable development, global citizenship, and relevant skills for decent work which coexist with the new scholastic curriculum in all schools in Latvia beginning with the new academic year of 2020./2021 (Andersone, 2019; Skola2030, Pārmaiņu iemesli). Despite the great responsibilities and engagement from governments and ministries of education 'there are nearly 200 million lower and upper secondary school-age adolescent girls and boys out of school globally and if current trends continue, another 825 million children will not acquire basic secondary-level skills by 2030' (UNICEF, 2020).

The global establishments IDEO recognized for its human-centred approach, where employers' expertise in such domains as digital transformation, media, environment, learning & education, circular economy, food science, games & play, health & wellness and more. The founders of IDEO brothers Kelley (Kelley & Kelley, 2013) in their book on unleashing the creative potential prove the connection of design thinking as a base skill of mastering the creative confidence to be opened to implement creative frames of minds and skills. In conformity with the provided data, the IDEO organization, which consists of more than 700 data and behavioural scientists, builders, designers, engineers, entrepreneurs, teachers and research, who develop the confidence to step into the future with optimism and creativity (Design Thinking for..., 2012).

In the 'innovation gap' where students are not prepared to face the demands of an intricate world, the skill of creative confidence helps to cover this gap and encourage innovation. To enhance creative confidence such concepts as design thinking and experiential learning are integrated through adjusted exercises during the subjects' lessons where students are intended to foster deeper learning to build skills necessary to work inventively (Stock et al., 2018; Foster, 2021). The most effective experiences

for creative confidence include magnified understanding of the value of creativity to society and students themselves as well as wider comprehension of various aspects of creativity (Lee et al., 2020).

This is one of the areas to explore from published literature and designed tools on creative confidence which has got some relevance to Latvia's curriculum for secondary education. The creative confidence's prime concept is extended through the design thinking, which is carried out in scientific, educational, business and other environments, to promote creative and positive impact through design and building up the appropriate mind-set, so other people's creative confidence could be imported too, thus, the objectives of the review were:

- to outline the key characteristics of the creative confidence in education;
- to describe the influence of design thinking's implementation in secondary school;
- to outline the role of teachers in facilitating creative confidence advancement in students.

The aim of this article focuses on key characteristics of creative confidence to notify about its successful implementation in secondary education to support the impact and necessity of creative confidence to be implied in syllabus.

Methodology

Although the IDEO mentions the creative confidence as a tool in design, engineering, education and other fields of projects and studies exists since 1991, the studios are in North America, Europe – Munich and London, and Asia – Tokyo and Shanghai, nonetheless, the concept of creative confidence definitely should be transferred further (IDEO at a Glance, n.d.). Thus, to make it possible for the future study, the research extracts the following research questions from the objectives above:

RQ1: What evidence in the literature is there for identifying key characteristics of the creative confidence in education?

RQ2: What scientific outcomes in the literature are there on the influence of design thinking as a tool of creative confidence in secondary education?

RQ3: What proof in the literature is there upon the teachers' role in facilitating creative confidence improvement in students?

The systematic review has been chosen as the main method for the analysis since the universal process involves identifying research questions, creating a specific search strategy, as well as recognizing and describing relevant research in the same field (Pollock & Berge, 2018). Eight scientific articles have been covered in the analysis, which allowed completing the triangulation for qualitative guarantee and verification of interpretation of all eight tasks. The specific literature on design thinking, creative confidence and competencies in secondary education have been chosen to be included in the review. The terms and methods connected with creative confidence as a tool in education were searched and examined. Additionally, the authors have explored Latvia's government curriculum and educational laws, worldwide online documents, journal articles and books. By evaluating selected articles and extracting relevant information from them the clear summaries and the final review were completed validly.

Results and Discussion

To meet the objectives proposed in this study, the search and analysis of published articles creative confidence was carried out. The e-sources were used to find and sort the scientific articles published during the period of 2013 to 2021, since the first time the term appeared in Kelley & Kelley book about the concept of the creative confidence in 2013. The selected journals were the following: Psychology of Aesthetics, Creativity, and the Arts; Journal of Cognitive Engineering and Decision Making; Qualitative Social Work; Innovations in Education and Teaching International; Thinking Skills and Creativity; International Journal of Art & Design Education; and Journal of Transformative Education.

The search was conducted using the websites of SAGE Journals, EBSCOhost, Taylor & Francis Social Science & Humanities Library, Google Scholar, and Web of Science during the month of November 2020 to November 2021. This search was primarily performed using the collocation 'creative confidence' in articles' title and keywords section. From the titles' names those articles that were devoted to education in secondary school or graduates were selected. Finally, 8 scientific articles that addressed the topic of

creative confidence were found during the specific period of publication. The analysis, apart from classifying publications by journals, also targeted to verify the identities of the authors and their research methods. Approximately 75% of the publications were operated through the qualitative research of case studies, whereas quantitative and empirical studies were presented in 25% of the articles on creative confidence. The main results may be observed in the following table (see Table 1).

Table 1

Publications on creative confidence in research journals (2013 to 2021).

The Author(s)	Research Method
Mannay et al. (2021)	Qualitative
Lee et al. (2020)	Qualitative
Lee (2020)	Qualitative
Hamilton et al. (2017)	Qualitative
Beghetto et al. (2020)	Empirical Study; Quantitative Study
Karwowski et al. (2019)	Empirical Study; Quantitative Study
Álvarez-Huerta et al. (2021)	Qualitative
Kijima & Sun (2021)	Qualitative

According to the case study of Arum and Roksa (2011) after two years of college studies, nearly half of students who have not improved their skills from the moment when they had just begun their learning, and one third showed no proceeds after four years. Furthermore, to enhance a variety of skill sets, education must establish opportunities for innovation's implementation that will take up the cooperation and multidisciplinary methods to solve problems (Wagner, 2012). For successful students' readiness two concepts: design thinking and experiential learning should be merged and carried out in syllabus. The combination of these approaches helps to increase awareness of creative problem solving at least in activities which require students to take multiple perspectives. By applying design thinking principles creates a deeper understanding of contextual surroundings. Likewise, experiential learning is a process in which knowledge is created throughout the transformation of experience. Additionally, the better planning of design thinking together with experiential learning leads to boost collaboration and appreciating the importance of different opinions. Moreover, these methods lead to the emphasis, which is placed on the process, rather than the outcomes (Stock et al., 2018; Desender et al. 2018).

Creativity itself and critical thinking are key elements in the process of interpreting an unclear issue into a statement of the problem, distinguishing the necessary information for the problems analysis, and exploiting design thinking to develop a feasible solution to the problem. It is essential for the teachers to provide the basic information before the students are intended to be engaged in the learning process. In a matter of theory-based courses and lessons, a list of expected and assigned readings is crucial. Even though students receive the guidelines through assignments, they get to be engaged in design thinking for the aim of developing the solutions (Peters & Maatman, 2017; Beghetto et al., 2020). Creativity as such can be recognized under four significant categories, identified as the 4Ps, described in the framework, which include: a creative product that is generated from a creative activity, a creative process elaborated with the creation of ideas, a creative person who creates, and a creative press or environmental influences on creativity (Tang and Werner, 2017).

As stated by Lee et al. (2020) and Foster (2021), understanding the concept of creativity and teaching it is a crucial part of nowadays educational institutions. Finding out the methods to expand creativity by learning experience will nurture students' learning abilities: to teach them self-oriented learning and advancement of any skills. Creative learning mostly is valued by students throughout the

educational approach by being involved in risk-taking, authentic, and free-will activities where their self-awareness of their own creativity is represented. One's beliefs appear to be crucial to enhance the self-oriented process for students and their learning. Critical self-reflection should come in one of the habits to stimulate personal growth and confidence in oneself in thinking, perception, and goal setting (Paltoglou et al., 2019; Walsh et al., 2021).

In the case study where students' digital portfolios were analysed in the terms of their creativity course, three main themes arose: creative dynamics, creative mind-sets, and creative confidence. Every portfolio included students' gained experience and insights from class activities, discussions, and projects, various types of presentations, reading and guest speakers. Creative dynamics allows exploring an extended view of the creativity's core in society; creative mind-set is associated with different aspects of creativity noticed in the content as to creative confidence – it contemplates on a deeper dedication with the new perception and changed behaviour which leads to transforming habits of mind and applying a creative solution for a real-world situation. Creative confidence can be performed by assessing what students exactly acquired during the specific period - the semester, an academic year – by the aid of the three subthemes: courage to leap, challenging oneself, and creative authenticity (Lee et al., 2020; Graham & Flamini, 2021).

The innovation creation process can be described as two independent stages: the first is the formation of new knowledge; the second is the application of new knowledge in practice (Karwowski et al., 2019). Process of innovation, which consists in the application of the latest educational theories, new forms of organization of the educational process, for example: project-based learning technologies, curricula on a free basis, which consider the individual interests of students (Basyuk & Antipenko, 2019). Consistent with Basyuk and Antipenko (2019) the most difficult areas of development of the mechanism for managing the quality of educational services based on the introduction of innovations are:

- creating an assessment of the competitiveness of the university and determining its regional level in the educational services market;
- determination and selection of the most optimal innovation strategies;
- creation of an assessment of the quality of educational services provided by the university based on the interaction of the university's innovation activities with innovative activities of partner enterprises.

Educators need to improve the level of their competence which is described in Table 2. This need is especially important in the professional activity of a teacher. The teacher should be competent in the subject area, methodically literate, possessing information and communication technologies, possessing the ability to establish communication with all participants in the educational process, able to work with children special educational needs: gifted, with disabilities, with behavioural deviations (Erokhina, 2019).

Table 2

Scheme of labour functions and professional competencies of a teacher.

Labour function			Professional competence	
<i>knowledge</i>	<i>skills</i>	<i>actions</i>	<i>obligatory</i>	<i>recommended</i>
Taught subject. Fundamentals of teaching methods, basic principles of the activity approach, types, and methods of modern pedagogical technologies.	Use and test special approaches to learning to include all students in the educational process, including those with special educational needs.	Planning and conducting training occupations: lesson structure; content of educational material; methods and techniques of the teacher's work.	Readiness to use tools and methods for planning and conducting training sessions.	Own the methods of organizing work on the formation of an environmentally sound, healthy, and safe lifestyle, including the rational organization of the educational process and the educational environment.

Labour function			Professional competence	
<i>knowledge</i>	<i>skills</i>	<i>actions</i>	<i>obligatory</i>	<i>recommended</i>
Ways to achieve educational results and methods evaluating results learning.	Objectively evaluate learners' knowledge based on testing and other methods control in accordance with real educational opportunities for children.	Systematic efficiency analysis training sessions and approaches to training.	Willingness to own methodology for analysing the effectiveness of training activities and approaches to training.	Own the technique knowledge generation and personal skills hygiene, skills take care of your own health, personal security, own ways of providing first medical help.

According to Gin (Гин, 2016) TRIZ-pedagogy is a pedagogical system, the main objective of which is to direct a creative person who is able to find the most unconventional solutions in different areas of life. The abbreviation TRIZ stands for theory of inventive problem solving (теория решения изобретательских задач) which was originated in the middle of the twentieth century by the science fiction writer and scientist Heinrich Altshuller. He himself invented from childhood, and when he grew up, he realized that inventors are not born, but they become ones.

To do this, certain principles should be followed (Гин, 2016):

1. The principle of freedom of choice. Teachers cannot impose on the student how and what to do. The students are more willing to do what they invented and suggested themselves.
2. The principle of openness. The students need to be shown the methodology and techniques, but they must solve the problem, find solutions, and generate ideas on their own.
3. Principle of operation. The more problems students solve, the faster they develop the habit of looking for something new, and the quantity will grow into quality faster.
4. The principle of feedback. A teacher or mentor should always control the learning process, answer questions. Not to help, but to push forward.
5. The principle of the priority of the developmental function. The students must strive to improve their own performance: without the pressure of a mentor or parents.

TRIZ-pedagogy is based on methods and technologies that allow mastering ways to remove psychological inertia RTV - development of creative imagination (РТВ – развитие творческого воображения) ; methodology for solving problems based on the laws of development of systems, common principles for resolving contradictions and mechanisms of application to solving specific creative problems OTSM - general theory of strong thinking (ОТСМ – общая теория сильного мышления); educational a system based on the theory of creative personality development TRTL (теории развития творческой личности ТРТЛ). In general, TRIZ pedagogy fosters the ability to see in any systems contradictions that hinder development, the ability to eliminate these contradictions, the ability to perceive any object, any problem comprehensively in all the diversity of their connections (Bykova et al., 2020).

To form strong creative thinking in the TRIZ system, the following methods are used (Utemov & Gorev, 2014):

- brainstorming - finding a large number of ideas and solutions on one given topic or within a certain period of time;
- synectics - a method of enhancing students' knowledge based on the selection of personal, direct, symbolic, fantastic analogies;
- mnemonics - a system of TRIZ techniques to simplify the memorization and reproduction of information;

- method of focal objects - the search for new creative solutions through associative series and transferring associations to other objects; for example, a TV set can be portable, and a flower is fragrant, then what will a portable flower and a fragrant TV look like;
- the catalogue method is the creation of fairy tales based on their basic elements: beginning - special circumstance - prohibition - violation of the prohibition - actions of the enemy - victory of the hero over the enemy with the help of a magic object or assistant - returning home.

Conclusions

Creative confidence is a notion which represents the belief of a person in oneself through all the possible and actual failures which may appear in a learning setting. Human-centred approach has a huge deal in the concept of creative confidence, since such terms as design thinking, experiential learning, and competences. If the IDEO organisation orients its goals on the development and usage of creative confidence in different spheres for adults and students, the TRIZ-pedagogy, however, is oriented on the development of students' creative imagination. Nonetheless, both approaches are successfully forming a creative mindset of a student who is willing to take risks, explore and set his or her own goals for future achievement.

The best assignments for students to develop their creative confidence not leaving behind the curriculum are those which provide a chance for a student to set the goal, follow it, and analyse at the end after some specific time; for instance: brainstorming activities and students' portfolios. Nevertheless, teachers should be aware not only of the skills, knowledge they gain during their learning process, but also about their obligatory and recommended professional competencies.

The findings of this review suggest that to provide the opportunity for students in secondary school to explore themselves and successfully achieve anything, creative confidence should be used wisely in lessons. In the further research the main aspects and differences of the IDEO and TRIZ may be studied and explored more.

Bibliography

1. Andersone, R. (2019). Innovations in the Improved Curriculum Content of the Competence Approach: a Case Study in Latvia. The Proceedings of the International Scientific Conference *Rural Environment. Education. Personality* (REEP), 13. Jelgava: Latvia University of Life Sciences and Technologies, 213-218. doi: 10.22616/REEP.2020.025
2. Arum, R. & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses*. Chicago, IL: University of Chicago Press.
3. Basyuk A.S., & Antipenko R.V. (2019). Mechanism of Educational Services Quality Management on the Basis of Innovative Implementations. *Razvitie obrazovaniya- Development of education*, 4(6), 54-58. (In Russ.) doi:10.31483/r-63837.
4. Beghetto, R. A., Karwowski, M., & Reiter-Palmon, R. (2020). Intellectual risk taking: A moderating link between creative confidence and creative behavior? *Psychology of Aesthetics, Creativity, and the Arts*. <https://doi-org.datubazes.lanet.lv/10.1037/aca0000323.supp>
5. Bykova, S. S., Buyanova, I. B., & Serikova, L. A. (2020). The development of divergent thinking in younger adolescents by the means of TRIZ-Pedagogy. *Perspektivy nauki i obrazovania – Perspectives of Science and Education*, 45 (3), 323-335. doi: 10.32744/pse.2020.3.24
6. Desender, K., Boldt, A., & Yeung, N. (2018). Subjective Confidence Predicts Information Seeking in Decision Making. *Psychological Science*, 29(5), 761–778. <https://doi.org/10.1177/0956797617744771>
7. Foster, M. K. (2021). Design Thinking: A Creative Approach to Problem Solving. *Management Teaching Review*, 6(2), 123–140. <https://doi.org/10.1177/2379298119871468>
8. Gin, A. (2016). *TRIZ pedagogy. We teach to think creatively. TRIZ-pedagogika. Uchim kreativno mislit*. Moscow: Vita Press.
9. Graham, J., & Flamini, M. (2021). Teacher Quality and Students' Post-Secondary Outcomes. *Educational Policy*. <https://doi.org/10.1177/08959048211049429>

10. IDEO (2012). Design Thinking for Educators. *Scribbr*. https://f.hubspotusercontent30.net/hubfs/6474038/Design%20for%20Learning/IDEO_DTedu_v2_toolkit+workbook.pdf
11. IDEO (n.d.). IDEO at a Glance. *Scribbr*. <https://www.ideo.com/about/ideo-at-a-glance>
12. Karwowski, M., Han, M.-H., & Beghetto, R. A. (2019). Toward dynamizing the measurement of creative confidence beliefs. *Psychology of Aesthetics, Creativity, and the Arts*, 13(2), 193–202. <https://doi-org.databases.lanet.lv/10.1037/aca0000229.supp>
13. Kelley, T & Kelley, D. (2013). *Creative Confidence: Unleashing the Creative Potential Within Us All*. New York: Crown Business.
14. Lee, J. H. (2020). Building creative confidence through an interdisciplinary creativity course: Changes in creative challenges and creative personal identity. *Innovations in Education and Teaching International*. <https://doi.org/10.1080/14703297.2020.1835689>
15. Lee, J. H., Portillo, M., & Meneely, J. (2020). Insights Into Three Frames of Creative Minds: Igniting Perspective Transformation Among First-Year University Students. *Journal of Transformative Education*, 18(2), 138–162. <https://doi.org/10.1177/1541344619893314>
16. Paltoglou, A. E., Morys-Carter, W. L., & Davies, E. L. (2019). From Anxiety to Confidence: Exploring the Measurement of Statistics Confidence and its Relationship with Experience, Knowledge and Competence within Psychology Undergraduate Students. *Psychology Learning & Teaching*, 18(2), 165–178. <https://doi.org/10.1177/1475725718819290>
17. Peters, R. A., & Maatman, J. (2017). Long-term trends accentuate the import of creative and critical thinking skills developed by design thinking and ill-defined questions. *Teaching Public Administration*, 35(2), 190–208. <https://doi.org/10.1177/0144739416680850>
18. Polirstok, S. (2017). Strategies to Improve Academic Achievement in Secondary School Students: Perspectives on Grit and Mindset. *SAGE Open*. <https://doi.org/10.1177/2158244017745111>
19. Pollock, A., & Berge, E. (2018). How to do a systematic review. *International Journal of Stroke*, 13(2), 138–156. <https://doi.org/10.1177/1747493017743796>
20. Skola2030. *Redzējums par skolēnu* [School2030. A vision of a student]. (n.d.). Riga: VISC. *Scribbr*. <https://skola2030.lv/lv/macibu-saturs/merki-skolenam/redzejums-par-skolenu>
21. Skola2030. *Pārmaiņu iemesli* [School2030. Reasons for Changes]. (n.d.). Riga: VISC. *Scribbr*. <https://skola2030.lv/lv/macibu-saturs/macibu-satura-pilnveide/nepieciesamibas-pamatojums>
22. Stock, K. L., Bucar, B., & Vokoun, J. (2018). Walking in Another's Shoes: Enhancing Experiential Learning Through Design Thinking. *Management Teaching Review*, 3(3), 221–228. <https://doi.org/10.1177/2379298117736283>
23. Tang, L.M. & Werner, C. (2017). *Handbook of the Management of Creativity And Innovation: Theory And Practice*. Singapore: World Scientific.
24. UNESCO (2017). Ensure Quality Education For All: Sustainable Development Goal 4; Ten Targets. *Scribbr*. <https://unesdoc.unesco.org/ark:/48223/pf0000259784>
25. UNICEF (2020). Secondary Education Guidance: Multiple and Flexible Pathways. *Scribbr*. <https://www.unicef.org/media/84246/file/Secondary-education-guidance-multiple-and-flexible-pathways-2020.pdf>
26. Utemov, V.V. & Gorev, P.M. (2014). *Pedagogy + TRIZ: Course of Scientific Creativity: Monograph. Pedagogika + TRIZ: kurs nauchnogo tvorchestva: monografija*. Barnaul: Sigpress.
27. Wagner, T. (2012). *Creating innovators: The making of young people who will change the world*. New York, NY: Simon & Schuster.
28. Walsh, P., Owen, P., & Mustafa, N. (2021). The creation of a confidence scale: the confidence in managing challenging situations scale. *Journal of Research in Nursing*. <https://doi.org/10.1177/1744987120979272>