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The Relationship Between Well-Being and Creative Thinking Skills in Education

Związek między dobrostanem a umiejętnością kreatywnego myślenia w edukacji

Abstract: Well-being, as an integral element of sustainability, contributes significantly to economic, social and environmental progress. Strategic frameworks such as the OECD Well-being Framework highlight key factors influencing well-being in Finland, including skills and R&D, green transition, gender equality, health and social cohesion. In education, the recent decline in PISA science scores underscores the importance of strengthening well-being and investing in future skills. Well-being is commonly understood as how people feel and function personally and socially, shaped by emotional, cognitive, behavioural and relational dimensions. In recent years, it has become central to educational discourse, emphasising holistic learning, social-constructivist approaches and whole-child development. Within this broader context, our study analyses the relationship between well-being and creative thinking skills. We apply the CAT's Model, which identifies four learning climates – sun, storm, space and soil – that foster creative attitudes and support the development of creative thinking skills. These climates promote inspiration, challenge, free thinking and the integration of diverse experiences. Classroom practices such as drama activities, play-based learning, interdisciplinary collaboration and critical thinking tasks illustrate how the model can be implemented effectively. The CAT's Model develops creative thinking through expertise, imagination, critical thinking and the ability to form novel connections. Our study provides practical examples of the model in application. We conclude that creative processes allowing freedom of expression enhance well-being, influence learning across the lifespan and support the development of positive personal traits.

Keywords: well-being; CAT's Model; creative thinking skills

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Abstrakt: Dobrobyt, jako integralny element zrównoważonego rozwoju, w znacznym stopniu przyczynia się do postępu gospodarczego, społecznego i środowiskowego. Ramy strategiczne, takie jak ramy dobrobytu OECD, podkreślają kluczowe czynniki wpływające na dobrobyt w Finlandii, w tym umiejętności oraz badania i rozwój, transformację ekologiczną, równouprawnienie płci, zdrowie i spójność społeczną. W dziedzinie edukacji ostatni spadek wyników PISA w zakresie nauk ścisłych podkreśla znaczenie wzmacniania dobrobytu i inwestowania w przyszłe umiejętności. Dobrobyt jest powszechnie rozumiany jako sposób, w jaki ludzie czują się i funkcjonują osobiście i społecznie, kształtowany przez wymiary emocjonalne, poznawcze, behawioralne i relacyjne. W ostatnich latach stał się on centralnym elementem dyskursu edukacyjnego, kładącego nacisk na holistyczne uczenie się, podejście społeczno-konstruktywistyczne i całościowy rozwój dziecka. W tym szerszym kontekście badanie analizuje związek między dobrobytem a umiejętnościami kreatywnego myślenia. Zastosowano w nim model CAT, który identyfikuje cztery klimaty uczenia się – słońce, burza, przestrzeń i gleba – które sprzyjają kreatywnym postawom i wspierają rozwój umiejętności kreatywnego myślenia. Klimaty te sprzyjają inspiracji, wyzwaniom, swobodnemu myśleniu i integracji różnorodnych doświadczeń. Praktyki stosowane w klasie, takie jak zajęcia teatralne, nauka oparta na zabawie, współpraca międzydyscyplinarna i zadania wymagające krytycznego myślenia, ilustrują, w jaki sposób model ten można skutecznie wdrożyć. Model CAT rozwija kreatywne myślenie poprzez wiedzę specjalistyczną, wyobraźnię, krytyczne myślenie i umiejętność tworzenia nowych powiązań. Badanie dostarcza praktycznych przykładów zastosowania modelu. We wnioskach wskazano, że procesy twórcze pozwalające na swobodę wypowiedzi poprawiają samopoczucie, wpływają na naukę przez całe życie i wspierają rozwój pozytywnych cech osobistych.

Słowa kluczowe: dobrostan; model CAT; umiejętności kreatywnego myślenia

> Perhaps the greatest of all pedagogical fallacies is the notion that a person learns only the particular thing he is studying at the time. Collateral learning in the way of formation of enduring attitudes, of likes and dislikes, may be and often is much more important than the spelling lesson or lesson in geography or history that is learned. For these attitudes are fundamentally what count in the future.
>
> (Dewey, 1938)

INTRODUCTION

In fact, over the last decade, well-being has increasingly become a central concept in the professional discourse on education, especially focusing on social-constructivistic way and holistic view of learning and teaching process and whole-child approach. What are the main reasons for the rise of well-being in education? We must first and foremost look at the results and background analysis of the PISA survey in 2022. PISA 2022 is the eighth international assessment cycle since the programme's first data collection in 2000. In 2022, nearly 700,000 students from 81 OECD Member and partner economies, representing 29 million across the world. Overall, the OECD averages show a marked downward trend in all three areas (mathematics, reading and science). PISA 2022 shows the lowest average scores ever in all three areas (OECD, 2023a). As the measurement planned for 2021 was organised and carried out a year later due to the COVID-19, it is not surprising that the poorer results were initially attributed to the

impact of the pandemic. But more in-depth analyses have pointed to other reasons. Well-being was high on the list. OECD defines well-being "as the quality of people's lives and their standard of living, which is a multi-dimensional construct that comprises both objective, material components and subjective, psychological facets".[1] The OECD final report pointed out, on the one hand, the value and complexitiy of the cognitive, social and emotional student outcomes. On the other hand, many education systems are weak at giving high-quality instruction and equitable learning opportunities for all through students' well-being (OECD, 2023b). Accordingly, we believe that in the coming years, well-being will be a major area of public education strategies in a significant number of countries participating in the latest PISA survey. The question rightly arises: How can higher education transform the growing needs of students' well-being?

Turning back shortly to the above-mentioned complexity and conceptualization of well-being, the cognitive, social and emotional student outcomes strengthen holistic view of students' development in public and higher education as well. We agree with Douwes and colleagues' somewhat vague but more focused definition of well-being "as a positive and holistic construct" (Douwes et al., 2023). The OECD Papers on Well-being analyses well-being in Finland and identifies key well-being insights and trends compared to other OECD countries (Fleischer & Stokenberga, 2023). In this sense, the kew concepts are skills and R&D, green economy, inclusive transition, gender equality, health and social cohesion. As we see, there are two-level complexity. The first level has strong transdisciplinarity, namely education is a complex sector wtih enermous collaborative impact to society, economy, environment, health, culture etc. The second level, see above mentioned, holistic vew of competency development in public and higher education.

In order to transform and implement into the education sector effectively, we need to handle these two-levels as a strategic and pragmatic dimensions, but the strating point the significant definition. Thus, conceptualization and understanding the concept is a basic step on this process. One of the most widely cited definitions of wellbeing is as follows: "wellbeing can be understood as how people feel and how they function both on a personal and social level, and how they evaluate their lives as a whole" (Michaelson et al., 2012). As we see this definition contains holistic view of live turning to the indiviual and social level formulating significant message to the education sector. Jarden and Roache define well being as the second, holistic level of complexity on emotion, behaviour and cognition (Jarden & Roache, 2023)

After the conceptual clarification of well-being, turning to the relationship between well-being and creative thinking skills in education, we are focusing on growing needs on creative thinking. *The Future of Jobs Report 2025* (World Economic Forum, 2025) brings together the perspective of over 1,000 leading global employers – collectively representing more than 14 million workers across 22 industry clusters and 55 economies from around the world – to examine how these macrotrends impact

[1] https://www.oecd.org/en/topics/students-well-being.html

jobs and skills, and the workforce transformation strategies employers plan to embark on in response, across the 2025 to 2030 timeframe. According to the Report, creative thinking, resilience, flexibility and curiosity are growing importance expected over the 2025–2030 period (see Figure 1.).

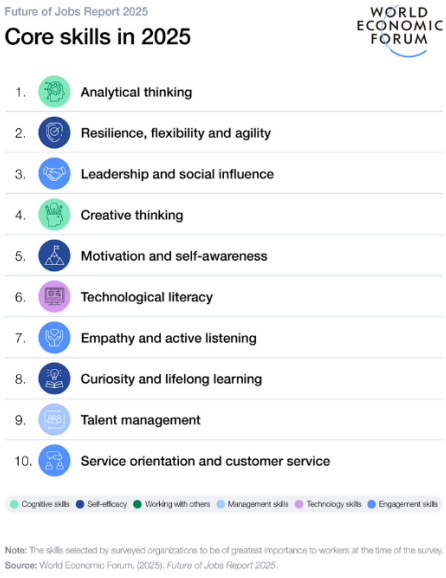

Figure 1. Core skills in 2025
Source: (World Economic Forum, 2025).

As we turn back to the top quote of this paper by Dewey, we think that the starting point to understand the relationship between well-being and creative thinking skills in education is this famous citation, because of the key word is "attitudes". One of the most significan attitude-based idea of creativity process is the CAT model.

Kyung Hee Kim from South Korea, a disciple of the American creativity researcher Ellis Paul Torrance (1915–2003), known as the "father of creativity" (creator of the Torrance Test for measuring creative thinking), published (2011) her influential study "The Creativity Crisis: The Decrease in Creative Thinking Scores on the Torrance Tests of Creative Thinking", published in the *Creativity Research Journal*, on the American creativity crisis, and then explored steps to address the crisis in *The Creativity Challenge: How We Can Recapture American Innovation* (2016). Kim (2016, 2017, 2019) explains the support and development of creative thinking skills using the research-based CAT model of the creative process through the metaphors of natural phenomena: cultivating climates, nurturing attitudes and developing thinking skills. The theory suggests that creative potential can be transformed into innovation by

supporting creative climates. This creative climate fosters the development of creative attitudes that lead to the acquisition of creative thinking skills. Kim uses specific visual metaphors inspired by nature, to interpret processes: she uses the image of the apple tree to illustrate thinking skills as roots, trunks, branches and apples (see Figure 2 for the CAT model). This apple tree, or the possibility of creative thinking, is supported by the attitudes and climate of the sun, the storm, the soil and the space. Based on the model, creative thinking skills are divided into four parts, which are: a) in-box expertise, b) out-of-box imagination, c) in-box critical thinking, and d) new in-box connections (Kim, 2019). Memorization, comprehension, and application are the foundation for learners' development and becoming experts in their own area of interest (In-box Expertise) (Kim, 2019). At this stage, learners are described as novice explorers who acquire a variety of skills so that they can become experts themselves through much practice (Kim, 2019). Kim (2019) uses Guilford's (1957) divergent thinking for the Out of Box Imagination stage, capturing the fluid imagination in the natural image of an apple tree that produces many flowers in the spring. According to Kim, the more experience a learner has in his or her field of interest, the "more fluid, flexible and original his or her imagination will be if he or she has developed a creative attitude" (Kim, 2019, p. 122). This stage therefore requires imagination and thinking skills such as divergent thinking, fluidity, flexibility and originality. In the

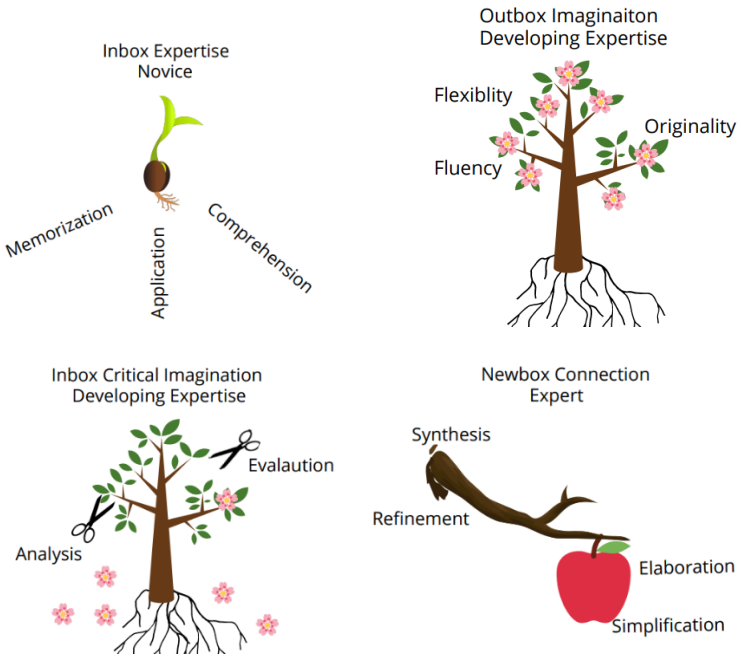

Figure 2. CAT model of creativity

Source: (Kim, 2019).

Inbox Critical Imagination stage, learners analyze and evaluate all their out-of-box ideas while learning to modify and refine their ideas through monitoring, analysis, and evaluation (Kim 2019; Mullen, 2019). By recognizing the differences between successful and unsuccessful ideas, learners can create their own learning goals and assessments. New Box Connection is the highest level of thinking that combines critical thinking and out-of-the-box imagination to create a new idea or concept (Mullen, 2019). Learners use *synthesis* to look for similarities and essential elements among new ideas. After combining them, they further *refine* their ideas, and create specific interpretations and modifications now for elaboration and simplification (Kim, 2019).

Kim (2019) and Mullen (2019) agree that the creative output is most influenced by the learning climate. In the apple tree of creative thinking, the apple is used as a metaphor for creative innovators. In their approach, learners need four "climate" elements for creative performance, namely: a) the inspiring and encouraging climate of the *sun*, b) the challenging and demanding climate of the *storm*, c) the deep and free-thinking environment of *space*, and d) the climate of the ground that offers resources, experience and diverse perspectives (Kim, 2016, cited in Mullen, 2019, p. 244) The sunny atmosphere inspires and encourages learners through self-expression, optimism, and big dreams (Kim, 2019; Mullen, 2019). While learners dare to dream big and plan, the stormy atmosphereprovides challenges that support the development of resilience and perseverance. Here, they can receive feedback on their activities, face learning challenges, and meet high expectations set by educators (Mullen, 2019). Educators have the opportunity to help learners with creative traits navigate challenges, take more risks, and learn from mistakes. And by teaching practical self-reflection skills, they can help students to manage mistakes and failures. This climate can support learners to acquire important skills in responding to constructive criticism, developing healthy thinking practices (including documenting their process), asking questions that lead to further improvement, moving away from perfectionism and working with others (Guillaumier, 2016; Petsilas et al., 2019). In the CAT model, the ground isa medium that is "interactive and holds multiple perspectives" (Kim, 2019, p. 124) and whose focus is on interaction and collaboration with different people and ideas (Mullen, 2019). Kim (2019) describes this collaboration as cross-pollination, by which she means learners' independent work on their own ideas and then combining them with the ideas of others. Interdisciplinary collaboration with others encourages learners to question prior assumptions and approaches, as well as to acquire effective communication skills and present persuasive arguments (Kim, 2019; Guillaumier, 2016).

How can we apply CAT's model in higher education, particularly in teacher training?

To develop *Inbox Expertise* in higher education – particularly in teacher training – based on Kim's CAT model (2019), the focus should be on building a strong foundation of knowledge, comprehension, and practical application within the future teachers' specific subject areas. This phase corresponds to the roots and trunk of the metaphori-

cal apple tree and is essential before any creative or critical thinking can emerge. Strategies to *Develop Inbox Expertise* in (1) Teacher Training is a Deep Subject Mastery through Practice, where curricula provide repetitive, scaffolded practice in lesson planning, classroom management, and educational theory use microteaching and lesson plan rehearsals with feedback loops to ensure mastery of pedagogical content with embeding domain-specific vocabulary acquisition and encourage its active use in peer discussions and written work; (2) Emphasis on Memorization + Understanding + Application in order to develop lower-order thinking skills (LOTs) from Bloom's Taxonomy (remembering, understanding, applying) with hands-on activities. It requires practical applications of theoretical knowledge (e.g. Piaget's stages in lesson design or scaffolding based on Vygotsky) implementing case-based learning where teacher trainees solve problems using specific models and theories; (3) Create Toolkits for Novice Educators encouraging the creation of personal pedagogical toolkits that include templates, checklists, and routines aligned with key teaching principles and facilitating methodology labs that simulate classroom scenarios and provide structured opportunities to test teaching strategies; (4) Support Cognitive Apprenticeship using modeling, coaching, and fading to move students from observation to independent execution. Pair students with mentor teachers in practicum settings where they can observe expert practice and gradually take on more responsibility; (5) Encourage Reflective Memorization using learning journals to connect memorized content with personal teaching experiences and promoting dual coding (text + visuals) and storytelling techniques to help internalize teaching concepts. Strategies to *Outbox Imagination – Thinking Outside the Box* is to develop divergent thinking, fluency, flexibility, and originality contain some learning and teaching acitivities, such as (1) Creative Analogy Challenge: Students choose a complex pedagogical concept (e.g. differentiated instruction) and represent it through an unusual analogy (e.g. "Teaching as Gardening"), then present it visually or narratively; (2) Unusual Uses Brainstorm: In small groups, students list as many non-traditional educational uses as possible for everyday objects (e.g. "How could a paperclip be used in a classroom besides holding paper?"); (3) Perspective Shift Task: Students write a short reflection on a teaching situation (e.g. a conflict in class) from three different viewpoints: the teacher, the student, and an observer; (4) Imagination Journals: Over several weeks, students keep a visual or written idea log of "what-if" teaching scenarios (e.g. "What if all assessments were visual?"), emphasizing idea fluency; (5) Metaphor Poster Design: Students create metaphor-based posters to represent teaching concepts (e.g. "Feedback is like a mirror"), fostering original and flexible thinking; (6) Fairy Tale Rewriting: Rewrite a classic fairy tale with a pedagogical twist (e.g. "Little Red Riding Hood as a new teacher navigating classroom management"); (7) "Worst Lesson Ever" Invention: Students design the most ineffective or absurd lesson plan they can imagine – and then analyze why it fails, which helps surface underlying principles creatively. Strategies to *Inbox Critical Imagination – Practicing Critical Thinking* are to analyze and evaluate ideas refining solutions. The learning and teaching activities are: (1) Peer Review Pro-

tocol: Students exchange lesson plan drafts and use clear criteria to give constructive feedback, identifying strengths, weaknesses, and opportunities for improvement; (2) Structured Debates: Organize classroom debates on controversial teaching methods (e.g. "Is homework necessary in primary education?"), requiring students to support arguments with pedagogical theories; (3) Socratic Seminars: Using pedagogical texts (e.g. Vygotsky, Freire), students participate in inquiry-based group discussions focused on critical questioning and reflection; (4) Teaching Mistake Analysis: Present flawed teaching videos or scenarios and ask students to identify the issues and suggest pedagogically sound alternatives; (5) Reflective Rubric Design: Students collaboratively create a rubric to assess imaginative teaching projects, justifying each criterion with theoretical references; (6) "Devil's Advocate" Exercise: Assign students to argue against their own proposed teaching innovations to reveal blind spots and deepen critical reasoning; (7) Error Correction Gallery Walk: Post flawed lesson plan elements around the room. Students rotate in groups to critique and correct them, justifying their decisions with evidence. Strategies to *New Box Connection – Synthesizing and Creating New Ideas* have the goal to combine imagination and critical thinking to develop innovations with some learning and teaching activities, for instance: (1) Interdisciplinary Lesson Plan Project: Students collaborate across subjects (e.g. math + art, science + literature) to co-create integrated lesson plans that highlight creative pedagogy; (2) Pitch Your Pedagogical Innovation: In a "Shark Tank"-style session, students present original teaching innovations (e.g. new apps, games, or assessment formats) to a panel of peers or educators; (3) "Future of Teaching" Vision Boards: In groups, students design visual concept boards imagining future classrooms, roles of teachers, and modes of learning; (4) Prototype & Feedback Loops: Students build prototypes of learning tools (e.g. a student motivation tracker) and go through multiple iterations based on feedback; (5) Educational Hackathon: Host a 1-day event where teams create solutions for a real-world teaching problem and present them at the end of the day; (6) Transdisciplinary Exhibition: Combine student innovations in a public exhibition (digital or physical) where teaching ideas are presented through mixed media (videos, games, models, etc.); (7) Concept Fusion Task: Students randomly combine two unrelated educational ideas (e.g. "flipped classroom" + "puppet theatre") and design a lesson plan based on the fusion. Strategies to NewBox Connection are also*: How can we create a creative climate?* Creative Climate – Cultivating Environments for Innovation has gol for creating a supportive, challenging, diverse, and open learning atmosphere. The learning and teaching activities are: (1) "Dream Big" Goal-Setting Workshops (Sun): Encourage students to set personal teaching goals and articulate their vision of an ideal classroom in a safe, inspiring environment; (2) Challenge-Based Learning Tasks (Storm): Present real-world educational problems (e.g. student disengagement) and challenge students to co-create evidence-based solutions under time or resource constraints; (3) Cross-Cultural Dialogues (Soil): Invite international students or educators to share classroom experiences, encouraging students to reflect on diverse perspectives and cultural assumptions;

(4) Open Studio Time (Space): Provide unstructured but supported studio or lab time where students can freely explore teaching ideas, experiment with tools, and engage in informal peer discussions; (5) Rotating Learning Environments: Conduct sessions in non-traditional spaces (e.g. parks, art studios, tech labs) to stimulate new modes of thinking. Summarizing the above-mentioned strategies, the common methodological elements are drama activities, learning through play, provide learning challenges of varying levels of difficulty, encourage interdisciplinary collaboration and developing critical and creative thinking skills (Mullen, 2019).

CONCLUSIONS

The relationship between well-being and creative thinking skills in education is based on creative process in which we can experience freedom of expression has a well-being-enhancing effect. This well-being learning has an impact on all stages of life, on the learning process, and helps to develop positive character traits. In order to reach this future picture, we need to change the traditional, rigid mindset in educaion turning to the transdisciplinarity and holistic view of competency development at individual, team and organizational well-being. This complexity is based from the conceptual changes of well-being and growing needs of creative thinking and resilience from the business. From the pedagogical point of view, in this paper we are focusing on the creative process to a greater extent, because we think the understanding the relationship between well-being and creative thinking skills in education is mainly a pragmatic challenge. But personalization and social impact as significant in this process as pedagogical culture. Turning back to the changing mindset, it is an attitude-based process with creativity and innovation.

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