A Mutualistic Model of Creativity: Establishing Creative Flow in Classrooms

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Introduction

Creativity is the basis of human learning and innovation, yet in many schools it is often narrowly defined and rarely taught. In schools, creativity is frequently associated with art products or tangible outcomes such as posters, models, video recordings, or other projects that can be displayed. This narrow view persists despite long-standing research that emphasizes creativity as a multidimensional human attribute that extends beyond the arts into everyday problem-solving and innovative thinking (Beghetto & Kaufman, 2014; Glăveanu, 2020). Evidence from the 2022 PISA Creative Thinking Assessment sustains this observation. Students who identified themselves as "artistic" reported higher creative self-efficacy than peers who did not, reinforcing the assumption that students equate creativity with artistic expression (OECD, 2023).

Creativity remains high on the list of desirable attributes for employees. However, time spent on developing creative practice is not always high on the list of skill-based instruction in public schools. In a series of wide-ranging interviews, Hopkins (2019) found that imagination and creativity are declining as the use of structured curricula and standardized testing are on the rise. As artificial intelligence continues to alter what work looks like, the future of jobs for the humans in the room is currently unknown. What IS known is that humans will need to be able to create new solutions in order to meet these unknown challenges. "Unclear goals, uncertain feedback, the possibility of unexpected innovations will be challenges in this uncertain future.

Spontaneity, imagination and original thinking are hallmarks of someone who will be able to combat these challenges (Sobehrad, 2025, p. 183).” While I don’t believe these processes are descriptors of AI, they certainly are creative habits that will be required of a future workforce in a world where change is constant. “It all boils down to the fact that humans are going to have to be what a machine can’t be. Empathetic, intuitive, imaginative, insightful, compassionate, creative (Sobehrad, 2025, p. 185). Getting students ready for such an unpredictable future means adopting creativity in classrooms as everyday practice while at the same time intentionally embedding creative work in the curriculum.

Creativity, Self-Efficacy, and Classroom Context

Creative self-efficacy is defined as an individual’s belief in their ability to generate creative outcomes (Tierney & Farmer, 2002; Karwowski, 2016). Research consistently reports that students with higher creative self-efficacy are more likely to persist through challenges and take risks. In addition, students are more likely to engage deeply in problem-solving tasks (Beghetto, 2017; Karwowski & Lebuda, 2020). Recent studies also confirm the idea that creative self-efficacy predicts both divergent thinking and real-world creative achievement (Harris et al., 2018; Royston & Reiter-Palmon, 2019). It is important to consider that creative self-efficacy does not develop in isolation. Bandura’s (1997) social cognitive theory emphasizes that efficacy beliefs are shaped by context and social support, as well as repeated experiences of success. In the classroom, teacher moves such as affirmation, scaffolding, and the inclusion of open-ended tasks in the curriculum are particularly powerful in shaping how students view their own creative skills (Sobehrad, 2025; Beghetto, 2019; Karwowski & Beghetto, 2019).

The 2022 PISA data support these conclusions. Analysis reveals that the classroom

environment has a stronger relationship to students' creative self-efficacy than whole-school structures (OECD, 2023). This suggests that teachers have significant opportunities to leverage creative practice regardless of systemic constraints. For instance, students who reported supportive teacher interactions and time to immerse themselves in creative work demonstrated higher willingness to try new approaches (OECD, 2023). Likewise, students with strong peer relationships reported higher creative self-efficacy, which spotlights the role of collaboration and social belonging in shaping creativity. These findings align with sociocultural perspectives that frame creativity not as an individual trait but as a condition that emerges from social interaction, dialogue, and shared meaning-making (Glăveanu, 2020; Lin & Kaufman, 2024).

Intervention: Everyday Creative Challenges

In response to these insights, I designed an intervention to explore whether embedding low-stakes, open-ended creative tasks could enhance students' perceptions of their creative capacity and habits of mind. Teams of students engaged in a series of short, unstructured challenges. The challenges were specifically designed to inspire creativity and encourage flexible thinking without the burden of formal grading or high-stakes outcomes.

Pre- and post-surveys measured students' creative self-efficacy and confidence in applying creative habits of mind such as noticing, perspective-taking, ideation, synthesizing, and embodied thinking (Mishra et al., 2011; Henriksen & Mishra, 2023). Classroom observations supplemented survey data, offering a way to examine student interactions and group dynamics.

Findings and the Paradox of Perception

Pre-survey results showed that students already rated themselves highly in overall

creative self-efficacy,which is consistent with other literature that suggests adolescents often express confidence in their problem-solving abilities (Karwowski & Lebuda, 2017). However, students reported less confidence in their ability to engage specific creative habits of mind.

Post-survey results were both encouraging and paradoxical. As expected, students reported increased confidence in employing creative habits of mind, and divergent thinking task scores improved. Students also reported lower stress levels when asked to engage in creative challenges which implies that repeated exposure to creative tasks reduced the anxiety often associated with the expectation to "be creative." These findings align with research suggesting that repeated, low-stakes practice supports resilience and lowers performance anxiety (Conner et al., 2018; Forgeard & Eichner, 2020).

Paradoxically, however, students' self-reported belief in their creative problem-solving ability decreased. This seems discouraging; however, what was reported and what was observed were contradictory. Based on nonparticipatory observations, creative responses were not diminished. Observed team conversations became more animated, and participation increased. Wild ideas were accepted and expanded upon. Students were able to generate ideas, challenge each other on the efficaciousness of those ideas, defend their ideas, and build on the ideas of others. In other words, students' creative processing increased even as their perception of their creative problem-solving declined.

This paradox may reflect students' narrow definitions of creativity. When creative tasks involved technology and engineering rather than artistic products, students may have been less assured that a creative response was appropriate. Exposure to unstructured, ambiguous tasks may also have increased students' awareness of complexity, making creative problem-solving feel too

difficult. Additionally the increased number of choices that resulted from an increased level of divergent thinking may have complicated decision-making, leading students to underestimate their creative competence (Harris & de Bruin, 2018).

Underpinnings: Sociocultural and Creative Flow Theories

Support for these ideas may be found in Glaveanu's Perspective-Affordance Sociocultural Theory of Creativity nicely summed up with this quote: "In evaluating creativity. . .we would have to consider the person as a whole, within his or her context, co-developing over time, to have a proper contextual understanding of how, when, and why someone expresses him or herself creatively (or not)"

As opposed to common theories that focus on personal and product attributes, Glaveanu's theory suggests that creativity is grounded in the difference between perspectives exposed and explored during conversations with team members; it is this dialogue that allows students to uncover unexpected ways to solve problems. This thinking lays the groundwork for educators to design classroom systems that stimulate creative flow.

Recent work further emphasizes this dialogic and ecological view of creativity (Lin & Kaufman, 2024; Beghetto, 2021).

The research also resonates with Csikszentmihalyi's (2014) concept of flow. Observations revealed moments when students were so immersed in open-ended tasks that time seemed to disappear. They experienced what Valsiner et al. (2015) describe as the transformation of errors into improvisation and, ultimately, into creative acts. Free from fear of failure, students were fully engaged in idea generation and collaborative problem-solving. In many cases, students were disappointed when time ran out, underscoring the intrinsic satisfaction of these

experiences. Recent studies confirm the importance of flow-like states for learning. When curiosity and challenge align, students demonstrate higher persistence, motivation, and creativity (Kashdan et al., 2018; Lin & Kaufman, 2024).

Contribution: The Mutualistic Model of Creativity

Based on these observations, I propose the Mutualistic Model of Creativity, which conceptualizes creativity in classrooms as the reciprocal interaction of three factors: self, habits, and tasks.The first of the three factors of the model, self, is most directly related to teacher interaction. Self-efficacy increases when educators recognize and reward small moments of creativity–the surprising use of a word in a new context, for example–and make those moments visible to others. Affirmation is one key to instilling confidence in students. Another key teacher interaction is asking relevant, open-ended questions. Open-ended questions require a person to pause, think, and reflect. The control of the conversation switches from the person asking the question to the person being asked the question, giving students the opportunity to expand on their thinking and ideas.

The second of the three factors, creative habits, are enhanced when educators teach students the art of noticing. Asking students to examine a natural object from multiple perspectives–close up, far away, inverted, inside-out–while voicing what they notice helps students find wonder which stimulates curiosity. Kashdan et al. (2018) advocate for curiosity as a critical component in education because it motivates students to engage deeply, explore subjects thoroughly, and retain information. In a joint study with Lin & Kaufman (2024), curiosity was a predictor of creative achievement.

Intriguing problems lead to curious engagement, while feedback from peers during collaboration can lead to the serendipitous discovery of new ways to act in solving the problem.

The third factor, tasks, are successfully orchestrated when students have enough domain knowledge to come up with a solution, and adequate resources to execute that solution. Ambiguous and unconventional tasks such as inventing a new organism from found objects or imagining stories based on random images encourage curiosity, and incites engagement and divergent thinking. Collaboration allows for idea-sharing from different perspectives, and students begin to expand their view of what an acceptable solution might be.

These three components are *mutualistic*, with each reinforcing and sustaining the others. Students with stronger self-beliefs engage more deeply in habits; habits are best exercised through ambiguous tasks; and tasks, in turn, validate and strengthen self-beliefs. The model emphasizes that creativity cannot be taught as a product; it must be nurtured as a reciprocal process within a designed classroom ecosystem.

Implications: Teachers as Ecosystem Designers

The findings highlight the role of teachers as designers of classroom ecosystems. By affirming students' creative self-efficacy, cultivating habits of mind, and embedding open-ended, low-stakes tasks, teachers can establish conditions where creative flow emerges. Practical teacher actions include:

- Recognizing and affirming small moments of creativity (Beghetto, 2019)
- Asking open-ended, reflective questions that invite elaboration
- Configuring physical and social classroom spaces to promote collaboration and dialogue (Kashdan et al., 2018)

- Embedding creative practice into existing routines rather than adding resource-intensive projects (Conner et al., 2018; Henriksen & Mishra, 2023)

Engaging in these actions allows educators to subvert their structured curricula in favor of cultivating creativity as an everyday practice. This approach responds to a call for an education that prepares students not just to consume knowledge but to generate novel solutions in a rapidly changing world (Robinson, 2011; World Economic Forum, 2023).

Conclusion

Creativity in schools is limited by narrow definitions and systemic pressures that tend toward standardization at a time when the need for flexible creative mindsets has never been greater. The paradox uncovered in this research, that students may underestimate their creative problem-solving ability even as they practice it more effectively, exacerbates the complexity of fostering creative confidence. The *Mutualistic Model of Creativity* emphasizes that creativity cannot be taught as product; rather, creative flow flourishes in an environment that nurtures multiple, interlocking strategies centered on creative thought, student agency and low-stakes risk-taking.

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