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Creative Dialogue with Generative AI: Exploring the Possible with Ron Beghetto

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Abstract
In this article, we explore the intersection of creativity, education, and technology, with a focus on the impact of Generative AI (GenAI). We delve into the transformative potential of GenAI in redefining educational and creative processes and challenging our existing notions of learning and creativity. Through a conversation with renowned creativity researcher Dr. Ronald Beghetto, we thematically explore how GenAI redefines educational and creative processes and challenges conventional notions of learning and creativity. Dr. Beghetto's work highlights a shift from fearing failure to embracing possibility thinking, advocating for a mindset that views creativity as a dynamic interplay of potential and adaptability. His recent work with GenAI tools illustrates their role as catalysts for possibility thinking, pushing the boundaries towards future-oriented thought and innovation. GenAI can function in multiple ways—including as a reflection of human intellect and values, and as a collaborative partner that enriches human creativity with its unpredictability and generative capabilities. We emphasize the importance of direct, critical, and creative engagement with GenAI in educational settings, cautioning against its passive or uncritical use, and advocating for a balanced approach that leverages its strengths while remaining aware of its limitations. Sharing several possibility thinking tools he has created, Dr. Beghetto offers readers a nuanced perspective on the role of GenAI in education and creativity, advocating for a future where these tools are used responsibly and creatively to unlock new possibilities and enhance human potential.

Keywords Creativity · Technology · Education · Artificial intelligence · Possibility thinking · ChatGPT · Generative AI · Futures thinking · Future possibilities

> I've never had an experience with a tool that can talk back. You know, I've never used a hammer that can talk back to me — *Ron Beghetto (speaking about generative AI tools)*
>
> AI is a mirror, reflecting not only our intellect, but our values and fears – *Ravi Narayanan*
>
> ChatGPT is a smart drunk intern — *Punya Mishra*

Introduction

Over the past decade, this series of articles has delved into a range of topics related to technology, education, and creativity. Most recently our emphasis has been on the field of generative AI (GenAI), acknowledging not just its potential to transform education and creativity but to even challenge, in unprecedented ways, our existing ideas about what it means to learn and to be creative. It is often difficult, however, to untangle the real impact of these early-stage technologies from the buzz and hype surrounding it. The history of educational technology has many examples of technologies (from film to MOOCS) that were expected to transform schooling, but failed to do so (Mishra et al., 2009). Yet, we have argued (Mishra et al., 2023a, b) that the impact of new technologies and new media may not be as direct on schools as it is on the world in which schools exist. New media and technologies change the social-cultural-ecological matrix within which education is embedded, so as educators and researchers it behooves us to take a thoughtful, critical, and skeptical

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stance towards these changes. Our goal, in this series, has been to shed light on these technologies through scholarly exploration, examining their possibilities and limitations to uncover new perspectives on human capacity. In the past year, we have interviewed thought leaders like Chris Dede (Warr et al., 2023), Ethan Mollick (Henriksen et al., 2023), Kyle Jensen (Woo et al., 2023), and Andrew Maynard (Richardson et al., 2023) to explore GenAI. In addition, we have also spoken with practitioners (Dunnigan et al., 2023) and explored the ideas more theoretically (Mishra et al., 2023a, b, 2024). In this article we continue our conversations with leading scholars by speaking with creativity researcher Dr. Ronald Beghetto. Dr. Beghetto, a prior guest in our series in 2018, merits an exception to our usual policy of not revisiting past contributors. His captivating work with GenAI tools on possibility thinking and creativity was a reason to seek his insights again.

Dr.Beghetto is Pinnacle West Presidential Chair and a professor at the Mary Lou Fulton Teachers College at Arizona State University and is globally renowned for his expertise in creativity and its applications in educational environments. He serves as the Editor of the esteemed journal, Review of Research in Education, and is the Series Editor for the Springer Books series on Creative Theory and Action in Education. He has previously served as the Editor-in-Chief for the Journal of Creative Behavior and a creativity consultant for both the LEGO Foundation and Cartoon Network. Dr. Beghetto has been recognized as a Fellow by esteemed organizations, including the American Psychological Association, the Society for the Psychology of Aesthetics, Creativity and the Arts, and the International Society for the Study of Creativity and Innovation. His contributions to the field have been acknowledged through numerous awards, including the 2018 Rudolf Arnheim Award for Outstanding Achievement in the Psychology of Aesthetics, Creativity, and the Arts, and the 2008 Daniel E. Berlyne Award from Division 10 of the American Psychological Association. Renowned as a public scholar, he is recognized as among the top 200 University-Based Scholars in Education, (as per the 2024 Edu-Scholar Public Influence Rankings).

Our conversation with Dr. Beghetto covered much ground, from possibility thinking to the role of failure, from the nature of GenAI to its potential role in the creative process, among others. We began however, by updating ourselves on his intellectual journey since our last discussion for this series. At that time, he was a professor at the University of Connecticut, so we began by exploring how his thinking has evolved over the past five years since we last spoke.

From Exploring Failure to Possibility Thinking

Dr. Beghetto described an important shift that happened in his thinking in recent years. It began from trying to understand one of the key barriers to creativity, the fear of failure. At the University of Connecticut, Dr. Beghetto directed Innovation House, a space for students to experiment and innovate in an open-ended manner. Despite this openness, he believed most students still worried about failing. As he said, it was a kind of "paralysis by analysis," where the analysis focused on questions like "What if this doesn't work? What if I appear incompetent or incapable?" He identified this trepidation as being part of a broader idea of how the ideas of creativity and innovation often came loaded with a great deal of baggage: that creativity was only for people in the arts, or that just some people are creative. Moreover, these failures, or perceptions of failure are "shot through with emotion" something that Dr. Beghetto described as "creative mortification," where an individual's identity becomes intertwined with their creative endeavors, whether it be in sports, poetry, or any form of expressive activity. This notion of creative mortification is a phenomenon previously described by Beghetto (2014) as the loss of willingness to pursue a creative aspiration following a negative performance outcome or feedback. This issue is especially common among young people who are simultaneously developing their creative identities and their capacity for creative endeavors (Sawyer & Henriksen, 2024). Dr. Beghetto argued that as one progresses from mere curiosity to actively engaging in and identifying with a particular craft, the stakes become higher, especially when faced with negative feedback or public failure. Such experiences can be devastating, particularly in the early stages of creative identity development, leading a person to question their creativity and potential (Beghetto & Dilley, 2016). He posits that this issue stems from a binary perception of creativity—of either having it, or not—rather than recognizing the journey of creative expression as one requiring continuous work and adjustment of goals. This conception has led him to take a somewhat different stance towards thinking about creativity, viewing it through a lens of potential and adaptability, rather than a fixed trait. He believes such an approach can prevent creative pursuits from being indefinitely suspended due to perceived failures or a belief in the impossibility of improvement. Explaining this shift in his thinking, Dr. Beghetto noted that this feeling of mortification is deeply connected to the negative emotion of shame.

> It's painful to revisit, because you just want to disappear in that moment when you're mortified by what happened with the feedback you received. That combination is pretty heavy, and it can be stifling. But I think that if you can reframe that or help people reframe the failure as just a possible experience, then they can realize other possibilities are still available, which can be beneficial. We are not following one linear path. If you hit a roadblock there are different

> possibilities that can emerge from it. And possibilities are an emergent, beneficial, and realistic way of thinking about ourselves as creative beings.

These ideas have led him to write two books, one called *My Favorite Failure: How Setbacks Can Lead to Learning and Growth* (Beghetto & McBain, 2022) and another, *Uncertainty x Design: Educating for Possible Futures* (Beghetto, 2023). The latter focuses on how when we discuss the possible or the future, we are referencing uncertainty, and the need to think and act in different and new ways. Thus, Dr. Beghetto's work, while still focused on creative thought and action in educational settings, shifted towards the emerging field of possibility studies. Though he had done some past work in this area, Dr. Beghetto recently intensified this involvement, especially through his leadership and participation in the international collective known as The Possibility Studies Network. He sees this work in possibility studies as a precursor to creative action. This is appealing because, he argued:

> Possibility thinking is action oriented imaginative thought. It's not only imagining or being aware of and exploring possibilities that requires imaginative thought, but it also has a baked in responsibility to identify actionable possibilities and that can make a positive impact.

Generative AI as a Tipping Point for Possibility Thinking

His interest in possibility thinking, and the concept of the possible coupled with future studies, underscores its future-oriented nature. Dr. Beghetto contends that while it is feasible to retrospectively consider what might have been or what could be, the essence of possibility thinking is its forward thrust, guiding us towards the future. This has also fed into his recent work, with the advent of widely accessible and powerful GenAI tools. He sees the advent of GenAI as a possible tipping point, but one with significant of uncertainty and ambiguity, as a tool that is…

> …forcing a lot of people in a lot of different sectors, including education, to consider, "Okay, what's possible with this tool? How is this going to change our futures? Will it change our futures? Is that going to lead toward brighter possibilities or lead to darker possibilities." I think that is where we are now. It leads to and fits in nicely with the possible, with creativity and the social project of education.

Thus, his current work focuses on the kinds of possibilities and futures this technology can create, and how educators can leverage it. In particular he focuses on how GenAI tools can serve as 'partners in possibility thinking,' to augment human imagination and creativity. Before we dig into the relationship between these GenAI tools, creativity, possibility thinking and its role in education we focus some attention on what it means to live and work with these technologies.

The Nature of Interacting with Generative AI

Dr. Beghetto has been using and building with the Application Programming Interface (API) of GenAI tools, like OpenAI's Large Language Models (LLMs) and other GenAI models since they first were made available to the public. He believes that the only way to understand what these tools are capable of is by engaging with them and building with them. Without this direct engagement it is easy to either under- or over-estimate the capabilities of these tools. As Barrat (2023) and others (Mishra et al., 2024) have argued the kinds of "intelligence" exhibited by LLMs is different from the understanding of the world humans have—thus, it has been described as a kind of "alien intelligence" (Warr et al., 2023). The fact that these models can engage in dialogue with us and appear to have a wide array of expertise does not mean that they "understand" the world as we do. Though such models have been trained on terabytes of text, images and other representations created by humans they lack any internal conceptual modes of what these representations mean and what their relationship is to the real world. This means that their responses can be both wide-ranging and surprising since they have constructed "models of the world" based not on interaction with the real world but only through representations of it.

Dr. Beghetto described a sense of surprise when he first engaged with LLMS for an extended period of time. "You have," he said, "this kind of realization that this is something qualitatively different than anything I have ever experienced." Although he is aware that LLMs are essentially nothing more than a "next word predictor" (a "stochastic parrot" as described by Bender, et. al, 2021), still, something surprising has emerged. As he said,

> It's a next word predictor, trained on this massive data set of human representations, comprised of anyone that's been on this massive human artifact called the Internet. And the internet is a semiotic projection of our collective worldviews. So, these LLMs can be thought of as a holographic, compressed projection of all humans that have participated on the Internet. You get a sense that there is an incomplete, but still compelling projection of this collective human artifact being reflected back to you. It is different from other holographic projections, like Princess Leia projected by R2D2 to Luke Skywalker in the Star Wars movie, because you can engage with it. You can be in

> dialogue with it. You realize that you're in communication with this fragmented world view of humanity, as represented in this artifact of the Internet.

The fact that these LLM's are trained on *representations* created by humans (be it text, images, video, images, computer code and more) but not on the real world has consequences for how we evaluate their outputs. In essence, these bots have been noted as "bullshit" artists, in the philosophical and academic sense of the term, as defined by Harry Frankfurt in his essay and subsequent book "On Bullshit" (Frankfurt, 2005). According to Frankfurt, "Bullshit is unavoidable whenever circumstance require someone to talk without knowing what he is talking about" (Frankfurt, 2005, p. 63). This is fundamentally true of LLMs that underlie many of the GenAI systems we engage with. In other words, these models…

> … manipulate words with no understanding of what they mean, with no correspondence with reality or truth. This is because ChatGPT3 (and other large language models) have no internal model of the world. Truth is not something they have been designed to care about. They float in a sea of words, unmoored from reality, unconcerned about meaning, reality and truth (Mishra, 2023).

Dr. Beghetto is aware of and attentive to this concern. As he said, "It is a machine. We can't anthropomorphize it." That said, he noted that it is also clear this technology or medium is unlike anything we have ever encountered before:

> I don't think we can just dismiss it as something like any other kind of technological tool or anything we've ever interacted with, because you can be in a conversation with it. It's very dialogic. When engaging with these models, I sometimes have to push back and nudge it along to respond, which is very bizarre. Like telling it, "No, you *can* do this," when it says it can't give me the full python code for something I'm building. This happened often when I was learning to code my bots. It would respond by saying something like, "You can add the rest of the code here" and I would respond, "No, I want you to do it, because I don't know how" and then it would. So, you have these strange human-like negotiations with it, which is interesting. You are in dialogue with something more than a simple question and answer machine, a 'skilled other.'

Dr. Beghetto is sensitive to the idea that this could be a kind of an *Eliza Effect*, which was first reported back in the 1970's by Weizenbaum (1976). The Eliza Effect is the strong feeling of interacting with a psychological being even when faced with a somewhat rudimentary natural language based interactive computer program (Sundar & Liao, 2023). In fact, in his teens, Dr. Beghetto programmed one himself (copying BASIC code provided from computer magazines), but he drew a contrast between these early chatbots and GenAI.

> I remember when I was a kid. I was using some basic version of the Eliza Chatbot that I coded into my Commodore home computer, and I was fascinated with it. But I already knew how it was going to respond because I coded it. I knew it was going to say certain things, and I could show family and friends, and they thought it was pretty cool but then I knew those responses were pre-baked in. But with GenAI I don't know how it's going to respond when I prompt it. There's a lot that's "to-be-determined." And, even more interesting, I can't predict what ideas I'm going to come up with because of my interaction with these tools. That's what is really generative and creative about it. It's like reading a book, but a book that can talk back. There's something happening there that is quite novel and singular. At least in my lived experience, I've never had an experience with a tool that can talk back. You know, I've never used a hammer that can talk back to me.

Dr. Beghetto noted the unique nature of interaction with GenAI. As Mishra et al. (2023a, b) remarked:

> GenAI doesn't just operate in isolation, but it interacts, learns, and grows through dialogue with humans. This collaborative dance of information exchange collapses the old boundaries that once defined our relationship with tools and technology. The meaning of these entities is not fixed or predetermined, rather, how we make sense of these new tools is emergent based on multiple rounds of dialogue and interactions with them, akin to how we engage, interact, and learn from and with human correspondents. Thus, we're not just users or operators, we're co-creators, shaping and being shaped by these technologies in a continuous and dynamic process of co-constitution (p. 246).

It is this dynamic and emergent nature of engagement with this technology that makes it, according to Dr. Beghetto, a truly powerful 'partner' in the human creative process.

Gen AI as a Creativity Partner

According to Dr. Beghetto, the dialogic, generative, unpredictable nature of these LLMs is what allows them to augment human creativity. He argues that, in some cases, these tools may be even better than human collaborators for enhancing emerging creative insights. Even our highly creative human collaborators can become somewhat predictable over time. In contrast, GPTs can be "really unpredictable."

Although they have constraints, he believes that with the right nudges and modified temperature settings, GPTs can surprise us with their responses.

There is a flip side to the fact that LLMs can surprise us—and that is the fact that these are also prone to confabulation. The field of computing has discussed approaches to lessening these issues—like devoting greater attention to training and fine-tuning, incorporating more human feedback, or additional guardrails. Yet, the tendency of LLMs to falsely present information as truth is an inherent and unavoidable feature of the technology itself (Bhojani & Schwarting, 2023). As we have noted in prior columns, the tendency to hallucinate is not a bug, but a feature—and one that in certain, informed circumstances, could support imaginative possibilities (Woo et al., 2023).

Dr. Beghetto is concerned about this tendency of GenAI to confabulate, noted that the tools will get better over time. Yet he also suggested that its hallucinations are problematic only if "you are looking for accurate answers." He argues that "the true strength (of GenAI) is that it gives you speculative perspectives that maybe you or anybody else for that matter has never thought of before." A critical aspect of being creative is the ability to engage in conceptual combination, i.e. bringing together divergent ideas, or ideas and their opposites to create an "emergent third." One of the bots that Dr. Beghetto has created (the Janus Bot: https://www.ronaldbeghetto.com/ptbots) does just that. It can take an idea and offer possibilities with the opposite of that idea; or take two pictures of two different objects and mash them together and create a generative third based on their opposites. Dr. Beghetto offers a different perspective on the idea that these LLMs are merely "stochastic parrots" (Bender et al., 2021)) since he says:

> It's not just parroting what's already out there. You can guide it to do combinations, these kinds of creative combinations that result in things that have never been done before, there's not an example of it on the Internet that you could find. That's a creative experience that you're having in the interaction with this technology, which is, I think, really fascinating.

Moreover, the fact that such tools interact in non-human ways means that they eliminate the things that people are often most afraid of when they are trying to creatively collaborate with other people—the aforementioned fear of creative mortification. These tools, he says, "don't mock your ideas," something that has been challenging in human-human contexts where—despite efforts to not be dismissive of other people's ideas (like in brainstorming sessions)—it is difficult, if not impossible, to entirely remove "that layer of social reality where people feel uncomfortable or vulnerable sharing nascent ideas." GenAI tools in contrast, never dismissively "roll their eyes," nor do they get tired of responding and exploring different possibilities. It is here that Dr. Beghetto believes that "there's something that is different than anything I've ever seen, even in the most kind of generative kind of creative collaborations I've been in, or I've observed." In particular, his interactions with these tools have informed and shaped his thinking about pedagogical approaches to supporting possibility thinking and creative ideation.

Learning with Generative AI – The Human-Bot-Human Loop

Despite its strengths as a creative partner, Dr. Beghetto highlights the critical role of the user in this interaction, particularly in educational contexts. It is important, he argues, to start with human-generated ideas, and then use GenAI to further analyze and enhance these ideas by identifying strengths, weaknesses, counterarguments, and new viewpoints. This iterative process, moving from human to AI and back to human input, offers a powerful method for enhancing creativity and ensuring a broader perspective. The pre-work, he argues, is critical if we are to truly leverage the potential of these new tools:

> When working with GenAI, I think it is most beneficial to bring an initial idea or questions about a problem you're trying to solve to it. You have to have a clear reason why you're using it. And that starts with having something that you've already have in mind. That's the key thing that I've learned. Yes, you could probably start generating ideas using that empty search panel that all these bots use. But I find it to be much more generative when you actually have a question or have some sort of uncertainty you are trying to resolve, when you engage with GenAI to explore possibilities. Giving it something to start with and the resulting dialogic exchange is where I think GenAI is most powerful.

Moreover, people need to learn how to best work with these technologies. And the best way, Dr. Beghetto suggests, is to become an 'AI explorer' and, most importantly, build with it. In fact, these tools are most useful when you know *how* to ask questions "before it can really produce things that you can recognize as being creative." In particular, Dr. Beghetto believes it is important to create and build with these new tools since knowledge is rooted in creation and action. Quoting the Italian philosopher Giambattista Vico's maxim *verum et factum (the true is the made)* Dr. Beghetto argues that "in order to really understand something, to know something and to do something with our ideas, we have to build something, we have to create something." He continues:

> That's the approach I've taken to AI. Yes, I've tinkered around with it. But I've been really trying to build bots, build ways in which people can interact with these tools and engage with them in a much more generative way, and stop treating them as search engines or glorified answer machines. I think that's where the problems occur. But if you build on possibilities in collaboration with them, then they could be really powerful.

As part of his research agenda, and to live up to Vico's maxim, Dr. Beghetto has created a whole series of bots that are available on his website.[1] These bots are designed to facilitate possibility thinking, creative ideation development, support educational strategy development, and assist with project development. They serve as AI-powered assistants, each specializing in a unique facet of creative, critical, and educational thought processes. They can help individuals and teams in generating new ideas, assessing creativity, transforming educational practices, and visualizing complex processes. For instance, some bots help to flip assumptions and explore 'What if?' possibilities, or offer formative creative feedback based on tasks and ideas provided to them. Others assist in the reimagining of educational lessons to be more student-driven and engaging. Dr. Beghetto is also engaged in a program of research around how learners actually use these bots in educational settings.

This idea of learning by doing also emphasizes another aspect of Dr. Beghetto's concern with this technology—that it may be used mindlessly and uncritically, as "truth engines." He believes it is an imperative to learn to critically engage and create with them, suggesting that "we need to really learn how to build with AI rather than simply use it or be used by it." Using it mindlessly, he worries, would lead to "a creative dampening" particularly for young learners who are in a vulnerable developmental stage of their lives. There is a danger of them losing their voice—a concern that is true of any kind of collaboration. It is therefore important that students have access to these tools, to play and build because it is only then that they would "maintain agency and ownership over their ideas even when augmented by AI." With guidance, students can learn to critically evaluate the output of their interactions with AI and maintain ownership of their own ideas.

> We want to help people understand that you don't want to lose or defer your agency or identity over to these tools. You want to maintain it. You can say, that doesn't sound like me. I'm not going to use that. Let me think that through again. It is important in this context for students to be checking in with other skilled humans (e.g., teachers, peers, external expets), and having conversations before and after use so that learners are still maintaining their voice, ownership and agency in this process. It's really important that young people have opportunities to engage with GenAI and do it in a structured way. Let's give all kids access, so we don't create an even wider digital divide. But let's teach them how to use this in a responsible, principled manner.

Despite his positive outlook towards how GenAI can be used as a creative partner, Dr. Beghetto voiced concerns about the focus on efficiency in most educational rhetoric around these tools. Most of the initial messaging he sees has been on how these tools are "going to make your life easier, more efficient." His concern is that most of these educational bots are going to be "mechanical skill and drill machines that are a bit more tailored to student needs based on assessments of where they are." While they are increasingly touted for personalized learning (Ruiz-Rojas et al., 2023), Dr. Beghetto questions whether this is truly personalized or merely "meeting individual needs based on what people think kids should be doing." Genuine personalized learning would focus on amplifying student voice and choice (Phan, 2020). True transformation would emerge from possibility thinking and the urge to "make the unfamiliar familiar and the familiar unfamiliar," rather than simply speeding up existing processes. While tutoring bots may quicken comprehension, they do not necessarily fundamentally change the learning experience.

The real breakthrough, Dr. Beghetto argues, will come from reimagining the essence of teaching, asking what it means to be a teacher in an era of AI-driven tutoring. And what does it mean to be a learner? The challenge is leveraging AI to transform education, redefine teaching, and enable students to explore and excel in new ways, rather than reinforcing the status quo.

> A lot of these tools are just going to be used *on* students to get them to do things they are already doing, whether they like it or not. It's really important that these tools give students an opportunity to be designers of their own futures and their own learning. That's where the generative aspect comes to life. How can this technology really transform education, provide more agency for teachers to reimagine their role? Most importantly, how can it get kids to accelerate their interest and capacities to do things in the world that they haven't been able to do before, and to open up

[1] Versions of his bots are available through OpenAI's Custom GPTs, which currently require a subscription to OpenAI. He also has been making his bots available to students and faculty by porting versions to the Arizona State University AI platform and making 'free use' versions available who are interested in trying them, but who are outside of ASU or do not have a paid subscription to OpenAI. More information at https://www.ronaldbeghetto.com/ptbots

the possibilities for their futures? This is what I really am focused on.

Conclusion

Our conversation with Dr. Ron Beghetto traversed the landscape of possibility thinking, creativity, and the role of GenAI in education. From understanding barriers to creativity such as fear of failure and creative mortification, to exploring the unfolding interplay between humans and GenAI tools, Dr. Beghetto's insights reflect the evolving landscape of educational technology and creativity.

Dr. Beghetto's advocacy for a mindset of the possible highlights a critical shift towards embracing uncertainty and leveraging it as a springboard for innovative thinking and learning. His work points to the importance of engaging with GenAI not just as a technological tool but as a partner in the creative process—a collaboration that could potentially redefine educational practices and foster a new era of creative exploration, but one that still has cautions and potential pitfalls.

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