

Not knowing

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Abstract

This chapter focuses on the role and value of not knowing for creativity, learning and development. More specifically, it proposes a typology of states that are conducive, in different ways, for creative learning, including certain knowing, uncertain not knowing, uncertain knowing, and certain not knowing. They are discussed, in turn, in relation to four associated experiences: trust, anxiety, curiosity and wonder, respectively. Towards the end, two models are proposed that specify how and when these experiences contribute to the process of creative learning. The first is focused on macro stages, the second on micro processes. While the former starts from uncertain not knowing, goes through the interplay between uncertain knowing and certain not knowing, and ends in certain knowledge, the processual model reveals the intricate relations between these experiences in each and every instance of creative learning. The developmental and educational implications of revaluing not knowing as a generate state are discussed in the end.

Keywords: uncertainty, knowledge, anxiety, trust, curiosity, wonder, creative learning

This chapter focuses on the experience of not knowing as it relates to that of uncertainty and, more broadly, to human development. Most of all, it aims to develop a broader argument as to how lacking knowledge can be an important developmental resource for creativity and learning, just as important as possessing knowledge, if not more.

There are clear connections between not knowing and uncertainty, so much so that one can easily assume that being uncertain necessarily involves various forms of not knowing (e.g., about what is happening at the moment, about how things will evolve, about what the current state of affairs means for oneself and for others, and so on). At the same time, there are experiences of not knowing that don't presuppose uncertainty, and the other way around – for instance, someone can be sure that he or she doesn't know something (Dönmez & Grote, 2013) or be unsure of existing knowledge (Woozley, 1952). From these examples, it would seem that not knowing is a wider category than uncertainty; and yet, we can also imagine ways of being uncertain that don't relate to knowledge, e.g., more emotional or existential ones (Gerard, 1963; Van den Bos, 2009).

One would be forgiven to think that both uncertainty and not knowing are either undesirable states or tolerated for as long as they are temporary in nature (for a critique, see Beghetto, 2017a; Anderson Blea & Welsh, 2020). This is because they could lead to anxiety and depression when sustained for a long time or to losing the desire to know or to understand, driving the person to either nihilism or skepticism. In contrast, certainty and knowing are typically considered virtues in a wide range of environments, from past and present classrooms to the workplace. In the end, why would anyone learn anything if, in the end, there is no prospect of attaining certain knowledge about it? Or how can decisions be taken in contexts in which every path leads to more unknowns?

There are, of course, many voices raised against these easy assumptions, particularly coming from creativity, innovation, curiosity and wonder research. Unsurprisingly, those scholars and practitioners who focus on processes premised on not knowing or processes that require uncertainty and its management, are much less inclined to perceive either as negative. On the contrary, their accounts point to the fact that uncertainty and not knowing are key experiences that are of great value to creative people in all domains and across the life course, as well as for students and teachers alike (e.g., Duckworth, 1975; Jones, 2013; Beghetto, in press). They also propose a more refined way of understanding these experiences by sidestepping the polar tendencies to vilify or romanticize. In doing so, they call into question our societal (and educational) obsession with pre-planned, intentional actions and the glorification of knowledge that is certain, universal, definitive.

I will join these voices in the present chapter adding what I hope are new arguments for why not knowing and uncertainty not only matter, but are truly instrumental for all those processes that make us human, from our capacity to wonder to the development of a sense of self. In supporting this claim, I will build on a small typology of 'states of mind' that exist at the intersection between our phenomena of interest: *certain knowledge* and the experience of trust, *uncertain not knowing* and the experience of anxiety, *uncertain knowing* and the experience of curiosity, and *certain not knowing* and the experience of wonder. These broadly connect to other typologies based on content, such as the distinction between known knowns, unknown knowns, known unknowns, unknown unknowns (e.g., Collins & Cruickshank, 2014), without any one to one mapping. I will start by reviewing, in turn, how each of these relate to creativity, learning, and development. In order to recognize the inter-dependence between these phenomena, I will refer most often to 'creative learning' following Beghetto's (2016, p. 9) definition of it as "a combination of intrapsychological and interpsychological processes that result in new and personally meaningful understandings for oneself and others".

My main aim, however, is to portray the four states of mind as dynamic forms of connecting person and world that reflect their constant co-evolution. It is, in other words, the 'movement' between certain knowledge, uncertain not knowing, uncertain knowing, and certain not knowing that interests me most. Towards the end, I will propose both a phase and a process-based model of creative learning, models that are premised on the interplay between the four main experiences referred to above (trust, anxiety, curiosity, and wonder). Instead of replacing certain knowledge with uncertain forms of not knowing on the pedestal of education and human development, it is more fruitful to notice how both of these – and all the states and processes in between – contribute to living full, creative, and dignified lives. With these considerations in mind, let's begin.

Certain knowing

There are few things as comforting as the experience of certain knowledge, a security we often seek in everyday life (Koriat, 2012). Being sure that what we know is correct helps us navigate situations smoothly and make quick and informed decisions. It also boosts self-esteem and self-efficacy by potentially increasing speed and performance. Those who don't have to doubt themselves or the validity of their knowledge tend to act fast and trust that they will reach the preferred outcome. Whether or not the certainty associated with this kind of knowledge passes the test of time and practical action is another matter (Schommer, 1990). In the moment of doing, there is confidence and little delay.

Most educational systems across history and across the world list the acquisition of certain knowledge as their end goal. Schooling itself is based on the implicit assumption that those who attend and are willing to learn will acquire useful information about the world, information that has been tested or verified and proven to be correct. Certainty is a key value for teachers as well, who are meant reflect it both in what and how they teach (see Nolan & Molla, 2017). In exchange, students are expected to be confident in their answers and not to question the validity of the wisdom they are imparted. Instead, the questioning is done by the teacher and most of the times it serves the purpose of steering the student away from false conclusions and towards the correct answer (Gall, 1970).

This approach has certainly come under considerable criticism over time for not encouraging critical and creative thinking (see Sternberg, 2012). When resting on the assumption of certain knowledge, students and teachers alike are less likely to question implicit assumptions or notice the taken for granted elements in their own thinking. And yet, this doesn't mean that there is no place for this kind of knowing within a learning or

creative process. Following in the footsteps of Descartes (1937/1968), we can note that at least one point of certainty is needed in order to engage in a sustained inquiry of our knowledge. Lacking the possibility of certain knowledge is disempowering and can discourage the person from thinking further. The question is, thus, what is the true place and role of certain knowledge in education and, more broadly, in human development.

To answer this, we need to understand what the experience of this kind of knowledge feels like. One way to describe this experience is to reflect on the notion of trust. Feeling trust means placing one's confidence in a person, process or outcome and being reassured that they will act predictably or reflect reality truthfully. Importantly, trust is not an individual state of mind, but a phenomenon that is constantly framed by wider social, cultural and political factors (Markova & Gillespie, 2008). It is also an essential experience for the healthy psychological development of the person (Winnicott, 1971), creating the necessary conditions of safety and comfort that enable the passage from dependence to independence vis a vis caregivers. Interpersonal trust is associated with various positive outcomes for both the person who trusts and the person who is trusted (Govier, 1993; Frost, Stimpson & Maughan, 1978). Interestingly, these positive effects extend to how people create together (Bidault & Castello, 2009; Boies, Fiset & Gill, 2015) since self-trust appears to correlate with the creative self-efficacy (Puente-Díaz, 2016).

I propose here that the experience of trust is essential for creativity and learning beyond groupwork and self-efficacy. While, in creative learning, one can trust others and their inputs, trust our own evaluation criteria, trust that the materials we work with have the expected affordances, trust that risk-taking will pay off as a strategy, etc., there is a more fundamental level at which certain knowledge supports a developmental process. Given that this kind of knowledge gives us the confidence to proceed, it is a key motivator for pursuing a course of action. It's not the trust that the chosen action is 'correct' that I'm referring to here, but that it will lead to interesting and potentially useful outcomes. Even in the most exploratory forms of creativity or experiential forms of learning, trust rests in the certain knowledge that new things will always emerge and that this emergence is positive and needs to be cultivated. Instead of placing certain knowledge as the end goal of education or development, we are well advised to see it as an enabler for both.

Uncertain not knowing

It is often in the act of letting go of certain knowledge that we discover new possibilities that fuel creativity, learning and development. But, as always, it depends on how much

uncertainty and not knowing we infuse into our thinking and action. Experiencing uncertain forms of not knowing represents, in many ways, the polar opposite of the category before. It is a state in which we don't only miss a clear understanding of things, but we are also uncertain about what exactly it is that we don't know. It is an unsettling experience that many individuals try to avoid on a daily basis. This is how, for example, the construct of 'intolerance of uncertainty' has been formulated and studied especially in its relation to worries and worrying (e.g., Ladouceur, Gosselin & Dugas, 2000), as well as in terms of its valid measurement (e.g., Carleton, Norton & Asmundson, 2007). Here, I consider uncertain knowing in view of the experience of anxiety vis a vis what is not (yet) known and what remains uncertain for the individual. While anxiety has a wider scope than not knowing and uncertainty, it is one of the chief responses to both (so much so that different authors talk about uncertainty-related anxiety; see Hirsh, Mar & Peterson, 2012).

Uncertain not knowing is not an experience that can be sustained for a long time without leaving a negative mark on the emotional and cognitive state of the person (a fact that has been documented for a long time, see Breggin, 1964). Even when it does not concern issues of existential importance, this kind of uncertainty is experienced as unpleasant and defense mechanisms are employed against it (Perna, 2013). One of them is ignoring things that we don't know about (and are uncertain as to what exactly we don't know or whether we could ever get to know more) or trivialize them. Another reaction could be to try, as much as possible, to eliminate either the uncertainty or the not knowing, even through incomplete, temporary explanations that take us closer to certainty and to knowledge. Yet another way is to contain this kind of anxiety and focus on what we do know or are certain about as a way of moving forward and continuing to act decisively.

While adaptive to different degrees, these reactions ignore the transformative potential of uncertain not knowing and its role within creativity and learning. Creative action often originates in both uncertainty and not knowing (Cremin, 2006; Zelinski, 1994) and it depends, to some extent, on how well the creator can withstand these states of mind and delay making quick and fast decisions. For learners, uncertain not knowing can be both a departing point and an experience that returns, again and again, whenever the learner is confronted with the new limits of his or her understanding. The anxiety that often accompanies such moments is in and of itself informative as it points to everything that lies beyond of understanding and view of the world. And this is precisely how uncertain not knowing becomes a key developmental resource. By focusing us on what is not within our grasp and making us unsure of what is, it directs out attention towards the great beyond vis a vis our usual thinking, action, and way of being.

It is not by coincidence that Heidegger (1927/2010) related existential anxiety with the reality of being in the world and with our existence as essentially open to a multitude of potentialities. Becoming aware of this openness and the many unknowns it presents us with can be destabilizing but it is a kind of instability that helps us remain open to the future (should we accept it). What we learn from uncertain not knowing is not knowledge about the world as much as knowledge about the self and its nature. The end goal of this experience is not to be replaced by certain knowledge, but to be used as a springboard for new ways of being. Anxieties due to uncertain unknowing are an ever-present companion of creative learning and they are not primarily an obstacle (as often believed), but a resource. We become more conscious of this when we don't deal only with the antinomy of certain knowing—uncertain not knowing. It is the 'mixed' states of uncertain knowing and certain not knowing that build bridges between these two poles and turn them into dynamic, recursive, integrative experiences rather than black and white experiences.

Uncertain knowing

Some of the most productive experiences for creativity, learning and development combine elements of certainty and uncertainty, knowing and not knowing. For example, we can think about uncertain knowing or being certain about not knowing as generative for our thinking and being in the world. Focusing on the former, we can conclude that all our knowing is described by different degrees of associated uncertainty. We might be sure of what we know and yet still eager to double check facts or think about what remains ambiguous to us. And it is these ambiguities that make us curious about what we could or should learn next, what we might be able to create or to think differently about. Curiosity, in this context, is a natural drive towards acquiring new understandings of ourselves, other people, and the world we all share (Loewenstein, 1994).

And yet, for us as natural as this experience is, we rarely question our knowledge on a regular basis, except when ongoing events make it unsustainable to be certain about it. This is why, for example, curiosity is born out of encountering surprising or unfamiliar stimuli in our environment (Berlyne, 1954). These stimuli create a tension or disequilibrium, a temporary state of not knowing that we are actively trying to replace with new knowledge. This is a key characteristic of curiosity and, more generally, the state of uncertain knowing – the fact that it prompts the person to explore things further in an effort to move from not understanding to understanding. These explorations can be imaginative (Swain, 2018) and/or highly embodied, taking the form of tinkering and

experimentation (Poce, Amenduni & Medio, 2019). In the end, curiosity needs to be 'satisfied' and the uncertainty 'resolved'. But, in the process, new questions emerge that led to new occasions to be curious and, as we shall see later, to wonder about things.

Curiosity is considered today a highly desirable trait and process (Lindholm, 2018). It is seen as important not only for the cognitive development of the person, but also for creativity (Karwowski, 2012) and even psychological health and well-being (Gallagher & Lopez, 2007). The 'responsibility' to cultivate a curious approach to self and world lies, from early on, with caregivers and teachers. There is a sustained criticism, however, addressed to schools in particular for not doing more to foster students' curiosity as an essential driver of learning and creativity (Engel, 2011). By not offering enough opportunities to be uncertain about one's knowledge, especially when this knowledge is acquired directly from the book or the teacher, we are effectively eliminating the possibility of inquiry-based learning in favor of what Paolo Freire called 'the banking metaphor of education' (Freire, 1968). The interest is, here, to create 'deposits' of (certain) knowledge within the minds of students rather than allow them to think for themselves. And, more broadly, it is not only students but teachers as well who are lacking opportunities to be curious and uncertain about their knowledge, teaching practice or the curriculum that guides them. Lesson unplanning and other similar strategies made to infuse a degree of uncertainty in education (Beghetto, 2017b) can go a long way in fighting the banking tendency and embracing new pedagogies of the possible (Glăveanu, 2020a).

But there are also limits as to what curiosity can help us accomplish. Perhaps unfairly, philosophers like Edmund Burke (1958) and Martin Heidegger (1994) have been exceedingly critical of this experience. They noted that curiosity easily changes its topic of interest, can make us distracted and, most of all, it can be a superficial state of mind. By aiming to take us from uncertain knowing to certain knowing, it is a process that tames unfamiliarity rather than cultivate it. And, in doing this, it misses some of the deeper, more transformative qualities of other processes such as wonder. But, instead of comparing curiosity and wonder, we should try to reflect rather on the place of uncertain knowledge within the broader picture of our ongoing transactions with the world. In this regard, the uncertainty of knowledge is a step within a wider process, one that can remove the uncertainty but can also maintain it. Curiosity doesn't always have to be satisfied and this is how, for example, we can find individuals who dedicate a lifetime to an overarching question (Gruber & Barrett, 1974), driven by the knowledge that they don't yet have.

Certain not knowing

From the different experiences discussed before, certain not knowing stands out as the most peculiar. While knowledge itself come with its uncertainties, it is rare for not knowing to as 'certain' as to lead to a recognition of one's limits (Martin, 2004). There are many things we don't know but few that we are ready to accept not knowing anything about. It is more comforting to either ignore the latter or, prompted by curiosity, to gain some understanding of them. Accepting with conviction that you don't know and dwelling on this state seems like the practice of skeptics and nihilists. The first question everything to the point of eliminating certain knowledge, the second deny its possibility in the first place.

And yet, it is certain not knowing and the experience of wonder it invites that hold the key to becoming aware of and to experiencing human possibility (Glăveanu, 2020b). This is because, ultimately, knowledge describes the world in a specific way and often fails to keep it open to a myriad of interpretations. In the lack of knowledge there is potential to know more and, especially, to know different. For building knowledge commits us to a given reading of reality one that makes other readings unlikely or labels them as wrong. Not knowing, on the contrary, excludes singular constructions of the world and, as such, eschews easy, dominant or hegemonic ones. In recognizing one's lack of knowledge rests the humility to learn from various perspectives and to still question each of them, in turn.

This was, essentially, the core feature of the Socratic method of inquiry (Seeskin, 1987). Socrates' aim was to shake our taken-for-granted assumptions and help us look at ourselves and at reality with genuine wonderment. This is also why he famously noted that philosophy, the love of wisdom, is born in wonder (Plato, 1903). Paradoxically, the discipline that studies the nature and role of knowledge itself finds its origin in not knowing and, more than this, in being certain of it ("I know that I know nothing", Socrates is supposed to have said). There is a deeper lesson here for learning and creativity researchers, many of whom consider certain knowledge as the end point for human development, even when one has to overcome uncertainty and not knowing in order to reach this state. For Socrates and Heidegger, the 20th century philosopher who tried to recover the meaning and value of Socratic wonder (see Heidegger, 1994; 2010), it was dwelling in the unknown that had the best chances of teaching us about self and world.

Wonder is, itself, contradictory in nature. It both makes us passive (wondering at) and active (wondering about), immersed (flow) and detached (reflective) about our experience (for details, see Glăveanu, 2020b). Wondering can be subjectively experienced as a heightened state of openness, an exalted way of being, or as a maddening return to the same question without reaching any clearer answer. It was the latter, after all, that

prompted the Athenian polis to sentence Socrates to death for corrupting the minds of youth and filling them up with paralyzing doubt instead of reassured certainty. But the doubting associated with wondering is only infuriating and paralyzing for those who wonder for the sake of reaching a final, definitive understanding of the world; the people who are certain about not knowing merely in order to know more and to know better.

The developmental value of maintaining a state of not knowing and learning from this experience rests precisely in delaying closure and avoiding pre-conceived ideas. There is consistent evidence, in the literature on creativity, that tolerating ambiguity and uncertainty (for a difference between the two see, Grenier, Barrette & Ladouceur, 2005) is associated with an increased likelihood of creative expression (including later on in life; see Csikszentmihalyi & Getzels, 1971). But, in order to make the most of wonder, one needs to be prepared to accept not knowing not as a negative but positive state, not as a means but as a goal in and of itself, not as a momentary, fleeing event but the basis of a unique, fruitful approach to life. And one must also notice the complex interplay between this special way of being and the trust, anxiety and curiosity discussed before. In the end, creativity and learning require all these different manners of relating to self, world and knowledge – when, how and why they become necessary is what I focus on next.

The creative learning process

As I argued above, each one of the four experiences discussed in this chapter – i.e., certain knowing, uncertain not knowing, uncertain knowing and certain not knowing – have a part to play in creativity and learning. In the following, I will refer to *creative learning* not as a new, third phenomenon, but use this term in recognition of the fact that each creative episode offers opportunities to learn and that every moment of learning involves the creative appropriation of new meanings and practices (see also Beghetto, 2016; Glăveanu, Johanne Ness, Wasson & Lubart, 2019). Moreover, this notion draws our attention to the intimate relation between creativity and learning, on the hand, and knowledge and uncertainty on the other. Traditionally, learning has been associated with the acquisition of knowledge while creativity, at least in its initial stages, with the experience of uncertainty. While some past research explored the connection between creativity and knowledge, its scope was mainly to consider how the latter either supports or inhibits the former (Weisberg, 1999). Equally, past discussions of learning and uncertainty considered the latter as springboard, a transitional stage to be overcome by the time learning is complete (Gallagher & Reid, 1981). In this chapter, I want to argue that (not) knowing and

(un)certainty are part and parcel of creative learning processes and they are not merely triggers, preconditions, end points or consequences of creativity and learning.

In making this claim, I propose here two ‘models’ of creative learning that formulate this phenomenon in terms of the interplay between trust, anxiety, curiosity and wonder, models that recognize the significant contribution of not knowing and uncertainty to human development. The first one is structural in nature and considers the main stages of creative learning seen in a rather linear manner. The second one is dynamic and tries to unpack the relations between these different experiences within each moment and stage.

Stage models have been highly popular in both the psychology of creativity and that of learning and development. We can be reminded here, for instance, of Wallas’s (1926) well-known phases of the creative process, including preparation, incubation, illumination and verification. Or the even more famous stage model of Piaget (1972), focused on the development of intelligence and moving from sensorimotor and preoperational to concrete and formal operations. Over the past decades, such linear models have been contested in both fields (see Glăveanu, 2014; Robberecht, 2007) and the emphasis has shifted towards constituting processes rather than distinct stages (see Lubart, 2001). One of the main points of contention is the fact that real-life episodes of creative learning have a much more recursive nature than different stages tend to suggest (and it is worth remembering that, for Piaget, the qualitative jumps made between stages of development are irreversible). More and more models of creativity and learning started to recognize the unstructured and intrinsically ‘messy’ nature of the processes involved (see Parks, 2008; Jones, 2018). And yet, we should avoid throwing out the baby with the bath water in this regard. Stage models are necessary to guide our macro-view of the process and, when they make room for internal differentiations and back and forth movements, they can be very useful tools for researchers and practitioners alike (see, for example Ness’s model of group creativity formalized as ‘the room of opportunity’ in Ness & Søreide, 2014).

How does a stage model of creative learning look like from the perspective developed here? Figure 1 proposes a view of this phenomenon that starts from the experience of anxiety triggered by the uncertainties of not knowing or not understanding something. It then proceeds by reflecting on existing knowledge, even if uncertain, and engaging in curious exploration. This exploration leads, often, to a clear and certain realization of what is not known and, thus, to the experience of wonder. It is the back and forth between questioning existing knowledge and wondering about the unknown that pushes creative learning forward, eventually gaining trust in what has been created or learnt and a sense of certainty vis a vis the knowledge acquired throughout the process.

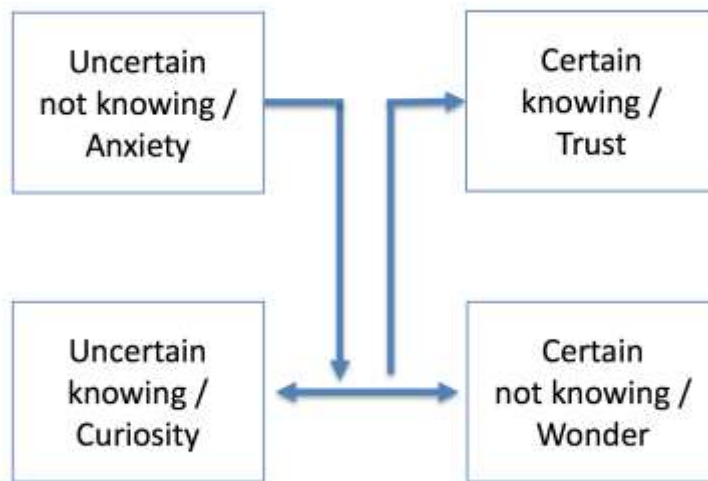


Figure 1. A structural model of creative learning

This is not to say, of course, that every single act of creative learning needs to start with a rupture in our understanding of the world and end with overcoming it and restoring a state of serenity and trust. We also learn creatively about things we are already familiar with and, at times, end the process in a state of doubt and dissatisfaction with what has been achieved. In fact, most artists would claim that they almost never reach a state of certainty in relation to their creative activity, something demonstrated by the fact that many have a difficulty saying when exactly the work is finished (Landi, 2014). At the same time, it is rare for any authentic forms of creative learning to not originate in a gap or problem that be cannot solved with usual, familiar means (Torrance, 1988). This is, after all, how we become aware of the fact that we need to learn something new and to create things or procedures we didn't use before. The end of the process – however we define it; e.g., for the artist it might be when the work is sold or presented in an exhibition – could leave us dissatisfied but still certain about what has been produced and knowing what exactly makes us unhappy. For as long as we dwell on uncertainty and not knowing, the processes of creative learning are ongoing.

This last observation is the basis for what I call the dynamic 'model', a zooming in on the different phases of creative learning that reveals, as depicted in Figure 2, the variable interrelation between trust, anxiety, curiosity and wonder. As the double arrows between the four experiences suggest, there is little regularity, at a micro level, when it comes to the movement between knowing and not knowing, certainty and uncertainty. In fact, the defining characteristics of creative learning remain its non-linearity and open-endedness (see Glăveanu & Beghetto, 2020). To take some concrete examples, we can focus first on the interplay between curiosity and wonder. As argued above, these represent two

different and yet inter-related moves. The first one makes the unfamiliar familiar by confronting us with uncertain knowledge that requires further exploration. The second one does the reverse, making the familiar unfamiliar or, in other words, helping us question taken-for-granted, familiar assumptions, opening us up to the certainties of not knowing. While these are two distinct experiences (see also Glăveanu, 2020b), they are often intertwined in creative learning. This is because the questions raised during curious explorations of uncertain knowledge can easily lead us to deeper unknowns, including about things we considered familiar and unsurprising. Equally, wondering about the unknown can turn into the gradual construction of knowledge, including knowledge (we feel) we can trust. Certain knowledge and uncertain not knowing stand in a similar dialogical relation with each other. In the midst of the anxiety of a rupture in our experience of knowing and of certainty, we can still place our trust in specific ideas, bodies of knowledge, including in ourselves and in other people. In fact, this background experience of trust is necessary in order to confront our anxieties and learn from them (Winnicott, 1971). Conversely, certain knowledge beyond any possibility of doubt or openness to not knowing is unproductive, at least from a creative learning perspective.

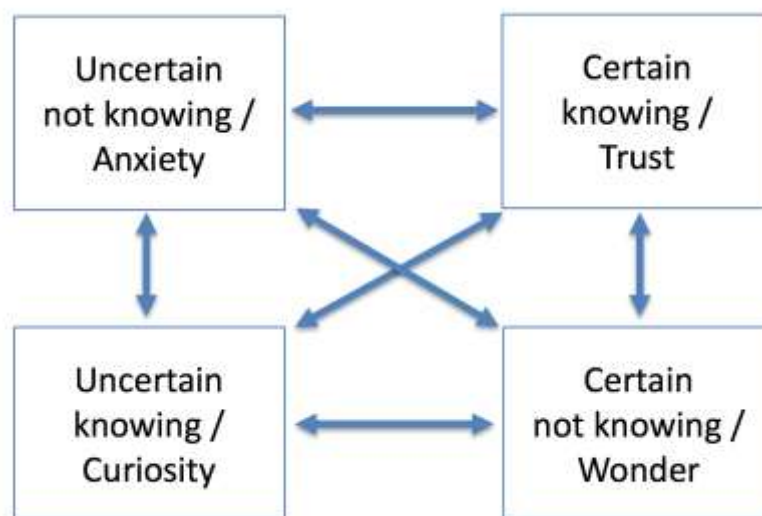


Figure 2. A dynamic model of creative learning

In the end, *creative learning itself can be defined as a fluid movement between certainty and uncertainty, knowing and not knowing that requires, at every stage, a balance between anxiety, trust, curiosity and wonder*. While, at different moments and for different people, depending on domain and personal characteristics, specific states might dominate and even overwhelm the person (think, for instance, about intense moments of wondering or all-consuming curiosity), it is important to appreciate the role and intrinsic

value of each one of these states. Uncertainty and not knowing, in particular, reveal themselves as important constructs for creativity, learning and development, illuminating a wide range of possibilities and keeping us open to multiple perspectives and a future that is yet to come (Glăveanu & Beghetto, 2020).

Implications

In the end, it's helpful to raise the question of why all these distinctions and models matter. Is it useful to re-describe the creative learning process in new terms, added to an already long list of concepts available in the literature, e.g., assimilation and accommodation (Piaget, 1972), generation and exploration (Smith, Ward & Finke, 1995), blind variation and selective retention (Simonton, 1998), divergent and convergent thinking (de Vries & Lubart, 2019), bisociation (Koestler, 1964), position exchange and perspective taking (Glăveanu, 2015)? The answer is an emphatic yes, especially given the fact that these new lenses we can use to examine creativity and learning are not meant to replace existing conceptions but to add to them a reflection on (not) knowing and (un)certainty. Why do we need this new focus? Because integrating in particular uncertainty and not knowing within our theories and models of creative thinking and human development is long overdue. Most developmental research, for instance, is built on the often-implicit assumption that we move from 'less' to 'more', from simple to complex, from not knowing to knowing (see Shaw, 1996). These theories ignore the intrinsically 'messy' and open-ended nature of our being in the world (Heidegger, 2010). And, in doing so, they fail to prepare us for the fast-changing, uncertain times we live in.

Placing not knowing and uncertainty – as generative states - at the heart of education is specific for the recently proposed 'pedagogies of the possible' (see Glăveanu, 2020a) which are ways of designing for possibility and creative experience in the classroom (Glăveanu & Beghetto, 2020). These pedagogies encourage teachers and students alike to go beyond what 'is' present, in the here and now, and explore 'what could be', 'what could have been', 'what will be' and 'what might never be', all spaces of possibility premised on the close interplay between knowing and not knowing. It is only by embracing this interplay that we can co-create knowledge and push development further.

How would a teacher, for example, prepare his or her classes when guided by the structural and dynamic frameworks proposed in this chapter? Most probably, in strikingly different ways that make room for anxiety (uncertain not knowing) and wonder (certain not knowing) in the classroom, instead of the more familiar states of curiosity (uncertain

knowing) and trust (certain knowing). He or she would allow students to dwell more in the unknown and embrace its various uncertainties. More than this, the teacher him or herself would do the same, allowing the unexpected and unfamiliar to irrupt within teaching and learning and transform both (Beghetto, 2017a,b). This is not, to be sure, a call for promoting disruption for the sake of disruption. As I argued before, certainty and knowledge are and remain important, formative experiences. Anxiety needs to be balanced by trust, curiosity by wonder and, ultimately, the most successful experiences of creative learning, from a developmental standpoint, need to keep these states in dialogue and tension with each other (see, for this, the dialogical writings of Bakhtin, 2010). In a world obsessed with recipes for how to create or learn, this chapter and the rest of the book represent open invitations to let go of absolute certainties and enjoy not knowing. If the arguments above hold, we will get to know more and to know different because of it.

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