

Dialogical Provocations: A Creative Trialogue

Vlad Petre Glăveanu

Webster University Geneva, 15 Route de Collex, 1293 Bellevue, Switzerland

University of Bergen, SLATE, Christies gate 13, 5015 Bergen, Norway

Giovanni Emanuele Corazza

University of Bologna, DEI-Marconi Institute for Creativity, Via Risorgimento 2, 40136 - Bologna, Italy

Université de Paris and Université Gustave Eiffel, LaPEA - F-92100 Boulogne-Billancourt, France

Ingunn Johanne Ness

University of Bergen, SLATE, Christies gate 13, 5015 Bergen, Norway

Future-making is a collective enterprise. Learning and creativity are as much psychological as they are social and cultural phenomena. The creation of new technologies requires division of labour, their use connects us with those around us. And the future of all the emerging field of learning, creativity and technology studies is ours to envision and to bring into being. Any speculation about the futures (always in plural) of creativity, technology and learning is therefore dialogical and depends on exchanges between different individuals and groups within society. Our final 'creative provocation', then, is mean to recognise and capitalise on the social roots of learning creatively, with technology, and speculate about these futures in an equally dialogical manner. This exchange brings together three authors with expertise in a range of relevant areas, from engineering and learning to sociocultural studies and the psychology of creativity. Our hope in using this format is that it will not only be more enjoyable and authentic but bring insights that both build on and expand what the present book offers in its rich array of contributions, views, and provocations.

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Future-making is a collective enterprise. It requires people who imagine, who respond to acts of imagination and who are ready to work together in order to turn imagination into reality. In the area of creativity, learning and technology, this underlining collaborative dimension of future-making is brought even more to the fore. Learning and creativity are as much psychological as they are social and cultural phenomena. The creation of new technologies requires division of labour, their use connects us with those around us. And the future of the three is ours to envision and to bring into being. Any speculation about the futures (always in plural) of creativity, technology and learning is therefore dialogical and depends on exchanges between different individuals and groups within society. Our final 'creative provocation', then, is mean to recognise and capitalise on the social roots of learning creatively, with technology, and speculate about these futures in an equally dialogical manner. This exchange brings together three authors with expertise in a range of relevant areas, from engineering and learning to sociocultural studies and the psychology of creativity. Our hope in using this format is that it will not only be more enjoyable and authentic (for us as discussants and for our readers) but bring insights that both build on and expand what the present book offers in its rich array of contributions, views, and provocations. This final chapter is, therefore, not the 'final word' on creativity, technology and learning; it is, in the good tradition of dialogism, an opening and an invitation – to engage in future-making in open, creative, and ethical ways.

Vlad Glăveanu: Paraphrasing Hartley (1953) in *The Go-Between*, we can say that ‘the future is a different country. They do things differently there’. This applies even more to creativity, technology and learning, one of the most rapidly evolving areas of interdisciplinary interest, an area consistently brought to the fore by the current pandemic. The present volume offers a unique collection of perspectives for all those concerned by this field and its future. Its framing in terms of ‘creative provocations’ is inspired as it captures the tense interplay between accelerated developments, particularly in educational technologies, and the need for further reflection as to how technology depends on and affects creativity and learning. This book raises important questions in this regard for theoreticians and practitioners alike:

Can robots be legitimately considered ‘creative’ (Cropley, Medeiros & Damadzic, this volume) and does AI help or hinder creative learning (Creely, this volume)? What is the place of technology (Plucker, Meyer, Karami & Ghahremani, this volume) and creativity (Zhao, this volume) in today’s education? Are we able to build creative ecologies (Harris, this volume) or will we fall prey to conceptions about creativity and learning that end up harming their development (Chemi, this volume)? How do we learn, create, and use technology in music (de Bruin & Merrick, this volume), fine art (Kozbelt, this volume), and sports (Thomson & Jaque, this volume)? Most of all, what does it mean to live in an age of uncertainty for teachers and students and can we use this uncertainty to our benefit (Beghetto, this volume)? How reflective are we about the current situation (Banaji, this volume) and do we pay enough attention those disadvantaged by it (Allen & Allen, this volume; Brandt, this volume)?

It is this last question that I would like to dwell on, and this is the question of ethics (see also Copeland, in press). Creativity, technology and learning are topics that invite considerable optimism about the human condition and our possibilities of transcending some of its key constraints. Through them, the common narrative goes, we empower learners to live up to their ‘potential’, we help creators expand their knowledge and networks, we build technologies that make life better and push education into the 21st century. A lot of these benefits are real and should not be underestimated. But we need to also consider how each expansion of the possible raises new impossibilities that need to be carefully reflected upon and challenged (Glăveanu, 2020a). Celebratory discourses about creativity, learning and technology are not as inclusive as we might think, nor are they addressing everyone. If the pandemic showed us anything in education it is how socioeconomic differences have a major impact on who has access to technology and can therefore use it to continue studying. And even where technology is present, it doesn’t mean that learning and creativity are fostered or recognised. Some students are expected to do well in the new digital spaces being opened, others are meant to struggle, and others yet are excluded from the category of ‘creative learners’. How, then, can we mobilize creativity, learning and technology to achieve something close to impossible: more equitable forms of educating and living?

Giovanni Emanuele Corazza: When speaking about creativity, technology, and learning, there are two points that are critical in my view. The first is the question about “who” is the agent of our educational concern, while the second is about “what” we feel is important and necessary to learn. Once these questions are clarified, then all discussions about “how” technology can be used to enhance learning and creativity of our agent can follow in a linear way.

The answer to the first question could simply be that the agent of our concern is a human being. But a human being is not a static entity: the very same technology that is discussed in this book has dramatic dynamic effects on the human mind, which turns out to be effectively extended by all the available technological means (Clark & Chalmers, 1998), although this might raise debates about the authenticity of such extension (Coin & Dubljević, 2021). Put simply, the part of the world that is connected to the Internet and that accesses it on a daily basis through personal devices such as a smartphone, is already today a population of cyber-humans, a population that could not live its

normal life if it were stripped of the technology it depends upon, and whose characteristics and intellectual capacities are destined to evolve very significantly within the span of a single generation.

If the above statement is accepted, then it follows immediately that the design of learning experiences that exploit new technologies (e.g., Allen & Allen, this volume, Chemi, this volume) are not only useful but “natural” for cyber-humans. The sanitary emergency caused by the covid-19 pandemic has given a significant push towards the online extension of our lives, that should not and will never completely replace our physical endeavors, but that will certainly affect them. A restoration of pre-pandemic conditions would appear to be impossible. In this view, the very interesting discussions about “creativity of humans vs. creativity of machines” (e.g., Creely, this volume; Cropley et al., this volume; de Bruin & Merrick, this volume; Kozbelt, this volume) are still affected by a sort of human vs. machine duality, that is actually being gradually replaced by the finely nuanced hybridization of the cyber-human being.

The second question addresses “what” we should develop through learning in our population, and many of us point towards creativity as a fundamental target (Beghetto, this volume; Brandt, this volume; Plucker et al., this volume). While we definitely agree that creativity will be a fundamental asset for well-being in the future (Corazza, 2017), we also need to recognize that thinking and acting creatively is not a panacea for all situations and all contexts. Creative behavior should always coexist with intelligent behavior, and striking the optimal balance in the development of these two fundamental constructs should be the real target of the design of new educational pedagogies (Corazza & Lubart, 2021; Corazza et al., 2021).

Ingunn Johanne Ness: There seems to be a consensus that technology and all its benefits are very important when it comes to education in the 21st Century. Still, one could argue that the focus should not be on technology alone but also on pedagogy - a pedagogy that will equip and empower students for the 21st century. Both dialogic pedagogy and education in the 21st century have in common that they want to empower learners by developing competencies that go beyond content knowledge (Teo, 2019).

In this section I want to make a point about both how technology needs to be a part of the whole pedagogical design and that it is important that teachers not only put an emphasis on what their students are going to learn, but also teach them how to learn. Both have pedagogical implications.

Most scholars agree that one of the most important tasks of education is to prepare learners for the future. This is a big task which involves reflecting on future competency requirements (Ness, 2020). Students will need to adopt to a work life and solve complex challenges that are largely unknown to us at this point. The only thing we can be certain of is that solving future challenges will require new forms of (digital) literacies, creative problem-solving skills, collaboration and communication skills, cultural and ethical awareness as well as lifelong learning. Such skills are often referred to as part of 21st Century skills and have in common that it is about going beyond the learning of content knowledge and instead focusses on a more holistic education that emphasizes life skills that are relevant and necessary to cope in the 21st century workplace (Beers, 2011). In other words, it is no longer enough to teach students what to learn; we also need to teach them how to learn (Teo, 2019).

This is also of interest for many educational researchers in the interdisciplinary field of Creativity, Learning and Technology. The field has received a lot of attention in the last couple of years, in particular due to the COVID-19 pandemic. There was an overnight need for a digital transformation to support teaching and learning. All communication were forced to move online, and teachers had to start using different technologies that for many of them, were new. In this way the crisis also influenced their teaching designs, created a need to develop new practices involving different digital tools, and in the end challenged their pedagogical approaches. At the same time as any crisis will be experienced as challenging (Beghetto, 2021), there is also a large creative and innovative potential

involved and the COVID-19 pandemic can be seen as a catalyst of the need to innovate the process of teaching. For many teachers it was their first venture into online teaching, and many were stressed as a result of the uncertain situation and finding themselves outside their comfort zone. The experience of uncertainty is of course uncomfortable, but it is also an opportunity to think and act in new ways (Beghetto this volume). No doubt, some teachers found this new situation very difficult and offered their students no more than video-conferenced lectures or voice-over powerpoints and email answers to questions. This approach became quite monological, and some students reported that they missed dialogues and the social interaction with teachers and other students and that they learned less when they could not discuss with their peers. Other teachers were more adventurous and took a variety of new tools and pedagogical practices into use in order to still create social learning spaces in their digital classroom. Video conferencing tools, like Teams or ZOOM were examples of teaching tool that made it possible for teachers and students to communicate. In ZOOM it was also possible to discuss in smaller groups (break out rooms) and in plenum. It soon became clear that teachers displayed a very different use of technological tools, also including which tools they made use of. Technology can support teaching approaches that open up for creative learning (Beghetto, this volume) which is about how educators design learning experiences with the goal of promoting new and meaningful learning in and also beyond the immediate learning event – but then the technology needs to be a part of the whole pedagogical learning design. What is important is that all teachers have access to and can use technology that can support their individual teaching needs that can go beyond teaching students' basic literacy to also involving the different necessary skills for the future, - meaning teachers need to reflect on both *what* and *how* they want their students to learn. It is therefore crucial to focus on the pedagogy behind the teachers' didactical choices since this will influence the different ways teachers make use of technology.

Dialogic pedagogy is a theoretical framework with an emphasis on exploring open questions, listening, arguing and thinking together in an equal dialogue. – The aim is to broaden our understanding (Alexander, 2008). However, it is important to note that dialogical teaching is not a method, it is instead a basic quality that should be present in all teaching, no matter the subject. Curiosity, doubt, questions, respect, critical exploration, reflection – these are all important aspects in dialogical teaching and might support students' ability to live in an age of uncertainty and to use this as a benefit (Beghetto, this volume). Students learn how to learn and to engage in dialogue with different voices and perspectives. This polyphony can be used as a creative stimulus and open up for new understandings (Ness & Riese, 2015; Ness, 2021). Technological tools can very well support such dialogues in the classroom if they are used as a part of such a pedagogical learning design. This is why we have to focus not only on the technologies that are becoming more and more advanced but also on the pedagogy that can help us to achieve a sustainable future.

Vlad Glaveanu: Corazza and Ness's commentaries elevate this discussion to what we can call the bigger picture around creativity, learning and technology. They both, in different ways, tackle the key questions of this emerging field and, like most questions, these revolve around the 'who', 'what', 'how' and 'why' of the phenomena we are discussing about. I am particularly persuaded by the idea that we should move away from focusing only on 'how' technology relates to, informs, enhances or, at times, inhibits creative learning. While interrogations about process remain vital within fields that consistently prioritized product and person (especially in creativity studies; Barron, & Harrington, 1981), we need to be able to connect processes with the actors, actions, audiences, artefacts, and affordances they are embedded within (Glăveanu, 2013). In other words, we should reflect on 'how' we engage technology in view of 'who' is involved in this engagement, 'what' artefacts and resources are being mobilized by it, and 'why' or 'for what' educational purposes.

Corazza's notion of 'cyber-humans' seen as an integrated whole instead of two 'elements' – technology and human beings – coming together in ways that can be coupled and de-coupled from each other, is very appealing from a sociocultural perspective. In this approach we have been

introduced since Vygotsky's seminal work (see Van der Veer & Valsiner, 1994) to the notion that people, signs and tools are systemically connected with each other and, more than this, that the human mind (and forms of action) would be impossible without cultural and technological mediation. The advance in digital technologies and the new context emerging from the pandemic have merely accelerated what was already our ontological condition as psychological, technological, and embodied beings. This non-dualist understanding has deep implications for how we answer the 'who', 'what', 'how' and 'why' questions raised throughout this book. Instead of talking about whether technology is facilitating or not learning and creativity we should be asking differentiated questions about the ways in which technology use shapes people, objects, places, practices, and power relations within society.

Ness reminds us of the importance of the broader epistemological framework we are working within. Instead of an old transmission model of knowledge – or what Freire (1970) called the 'banking model of education' – in which teachers deposit information in the minds of their students, we are consistently moving towards the wide scale use of dialogical, inquiry-based pedagogies.

Acknowledging the integral role played by technology in these educational developments is not enough. As Ness mentions, we need to connect the 'what' and the 'how' students create and learn with technology. We need to open up dialogical spaces in the classroom, including about education, new technologies, and what it means to live 'cyber-human' lives. Dialogism here become not only a method or a means to an end but part of the end or the goal itself. Critical reflection and creative engagement should permeate education, independent on its level and discipline, instead of being added on to the curriculum in designated (but contained) classes and exercises. The 'where' and 'when' of these practices (besides the 'who', 'what', 'how' and 'why') become important for developing students, learners and creators adapted to this turbulent 21st century.

Ingunn Johanne Ness: As Glaveanu says, critical reflection and creative engagement should permeate education, independent on its level and discipline. I believe that it is not enough to teach students creative engagement, creative learning or creative problem solving as a specific technique. The weakness of such a way of thinking is that specific methods will be too narrow, and it is also not sufficient to link creativity to specific disciplines and over short periods of time. Corazza says that while we agree that creativity will be a fundamental asset for well-being in the future, we need to recognize that thinking and acting creatively is not the only solution for all situations and all contexts and always need to be balanced with intelligent behavior. This is also something that needs to be reflected upon when designing new educational practices.

I would also argue that when designing new educational pedagogies, both critical and creative thinking must be balanced and seen in context of our greater global society. Thus, the questions on the 'where' and 'when' of these practices, in addition to the 'who', 'what', 'how' and 'why', become important for developing learners adapted to this turbulent 21st century, as Glaveanu states. Neither critical thinking or creative processes are specific, instead one must think more holistically and let both critical thinking and creativity be part of the whole curriculum in schools and take place across courses at university level. It is therefore important that we can offer arenas where pupils and students can practice creative processes through dialogue with open and exploratory questions in all subjects and cross subject boundaries over time so that this becomes something that has continuity in the pupils' and students' everyday lives. This is demanding for any teacher. It is also a challenge when teachers are faced with an education system with testing and a results-oriented approach that does not primarily allow for creativity and exploration of different perspectives which in turn can hinder valuable creativity in the classroom.

Dialogue is the central concept in the works of Mikhail Bakhtin, a Russian philosopher of language, literature and culture. Bakhtin's view on dialogue comprises both an ontological and an

epistemological understanding. Dialogue was according to Bakhtin (1981), both a fact of life and at the same time an ideal to strive for. True dialogues have a plurality of perspectives, Therefore dialogism is so important in order to avoid echo-chambers with dangerous belief systems that are not challenged., Freire's work on the role of dialogue in the empowerment of 'the oppressed' (2000) shows how dialogue is crucial in true education. Dialogue enables us to 'name' the world and claims that this dialogue cannot be reduced to the act of one person's "depositing" ideas in another (Maine & Wegerif, in press).

Giovanni Emanuele Corazza: I agree with both Ness and Glăveanu, whose comments help us grasp the complexity of the issue we are trying to tackle, which cannot be addressed with simple, ready-made solutions. In fact, the critical reflection and creative engagement that are called for by both Glăveanu and Ness should be applied not only in the classroom but also in the meta-level of designing the education system. But anyone who has tried to propose reforms of the education system that go beyond an educational status quo, which finds its roots back in the first industrial revolution, knows that resistance to this specific change is extremely strong.

It is interesting to try to briefly analyze the nature of this resistance, as well as its original cause. Since the 18th century, i.e., the start of the industrial revolution, the strongest socio-economical trend became that of *standardization* (Corazza, 2016; Corazza et al., 2010). This is because an economy based on industry implies vast productions of standard products and massification of taste, in order for those products to be sold and consumed. Somewhat inevitably, the trend for standardization percolated also to the educational realm: the majority of the population was illiterate and not ready for the lifestyle of the industrial society, and it was necessary to raise the level of knowledge and competence of the masses. Standardized education and testing became more and more established, up until today. Whereas this had clear positive sides in terms of raising the general cultural level, it also created a system which tends to preserve itself: the strength of any standard is directly proportional to the number of people/institutions adopting it, and educational standards are no exception.

Returning quickly to the topics discussed in this book, a key question can be raised about whether the available new technologies will help moving away from the above standardization trend in education, opening up a new era for learning and creating. Interestingly, the answer is far from obvious, as both positive and negative elements can be identified.

On the positive side, new technologies allow anyone to access information on any knowledge domain, thus enabling interdisciplinary and transdisciplinary approaches that would be very difficult otherwise (Corazza et al., 2021). This points to the possibility for a sort of new Renaissance, an epoch in which anyone will have the chance to go well beyond the narrow limits of a single discipline and a single profession. Also, personalized learning paths can be designed through AI-enabled systems, leading possibly to the fuller realization of everyone's potential. On the other hand, there might also be negative sides, potentially quite dangerous.

First of all, learning through virtual classes might start a trend towards homogeneity of knowledge, possibly caused by the fact that certain educational models will win over others in the battlefield of the global competition of education in virtual worlds. It would certainly be in the interest of superpowers to impose their educational model even beyond the geographical borders of their political control. More subtle but also more dangerous is the possible control of both search engines and data-based AI algorithms, which have already become but will more and more be the sources of information through which we will answer most of our questions. Biasing the response of an Internet search engine or the outcome of a big-data analysis might be powerful instruments for hacking culture. As touched upon by Glăveanu above, to prevent or counter these negative sides ethics will

be crucial, playing a major role in ensuring a new form of human rights, which we could define as 'equitable and unbiased access to digital information in educational, professional, and everyday settings'.

Vlad Glăveanu: It is always exciting to explore both the challenges and opportunities of new or at least newly introduced technologies in educational spaces. As Corazza rightfully notes, inter- and transdisciplinarity can be immensely helped by increased connectivity; at the same time, issues of power and monopoly over technology itself, its algorithms, and the pedagogical uses of both, are starting to come to the fore. Ness comes back to the topic of dialogue that seems to be a recurrent theme, at least within sociocultural approaches to creativity and learning. Educational technologies are and will continue to massively impact how dialogues unfold, from the range of perspectives they invite to the processes through which they build consensus or lead to further divergence. The medium might not be the same as the message, yet it certainly contributes to how we receive and interpret messages (and understand who is sending them) in both education and beyond.

One interesting question about technology and dialogue, however, is whether we can truly create dialogical spaces within digital environments, either in the form of human-computer or computer mediated interactions with other fellow humans. Despite a resurgence, in recent years, of post-humanist thought (Wolfe, 2010), advancing the view that human and non-human actors share agency and engage in equal terms in assemblages we refer to as institutions and social practices, critics are quick to point to the loss of authenticity in online human relations. Some authors more or less explicitly question whether technology is indeed conducive for dialogicality (e.g., Marková, 2017; Jovchelovitch, 2019) or rather controlling and, when over-used, alienating. In what ways can we foster authentic dialogues, in education, in spaces that miss the embodied presence of the other and, frequently enough, present us with stereotypical views of who the other is?

Giovanni Emanuele Corazza: Reacting to the question posed by Glăveanu about the possibility to truly create dialogical spaces within digital environments, I believe we need to distinguish two fundamental elements: the medium and the actors. Regarding the medium, it can be argued that no digital experience will ever be able to completely match the experience of a physical dialogue between humans, in which communication exploits several parallel strands going well beyond the spoken words. Perhaps, when the on-going development of technology for fully immersive experiences (able to carry more than audio and video) will have reached maturity, we will have a digital experience that is as close as possible to a physical one; but I feel something will always be missing.

On the other hand, reduced forms of communication that exploit sensorially limited services, such as videoconferencing, video calls, voice calls, texting, or email cannot be ruled out as supports for creating effective, albeit different, forms of dialogue. In fact, the limitations of the medium can even be turned to advantage if one is able to master its characteristics. To make a very significant example that does not relate to the digital world, in pre-historic times all that humanity possessed for transferring information was face-to-face narration, i.e. physical dialogues. When the technology of "writing" was introduced in early civilization, a totally new world of virtual (in the sense of indirect) dialogues was opened, certainly with different characteristics, but nonetheless extremely powerful in generating exchanges across cultures and time epochs. In essence, we believe that all digital communication media are helpful in supporting dialogues, although in a variety of modalities and with diversified effectiveness.

Regarding a dialogue between human actors, it is interesting to note that their dialogical ability, as well as their personality, can vary considerably across communication experiences over different media. In other words, it appears that today a person has no "single" personality or dialogical ability,

but several of these, depending on the diverse communication supports one uses. An important problem for this actor would therefore be to maintain coherence amongst these different “selves”, while knowing at the same time that what one shows on a general-purpose social network will never be the same as what appears on a chat with close friends, or on a professional Internet blog.

Finally, the most intriguing case might be that of a dialogue on a digital communication medium in which the involved actors include also (or only) artificially intelligent machines: could this still be an *authentic* dialogue? This question definitely calls for a philosophical analysis which cannot be attempted in a few lines. Let it suffice here to say that we believe authenticity in this case is not attainable today but perhaps tomorrow, as it will require to endow machines with awareness, i.e. with conscience. Whereas this might seem to be an impossible task today, work is under way to give a mathematical basis to the seemingly unseizable concept of conscience, opening up the possibility for its artificial production (Tegmark, 2015; Tononi, 2012).

Ingunn Johanne Ness: New technology offers both opportunities and challenges and I agree with both Corazza and Glaveanu in having a critical mind to both. Glaveanu brings up a point regarding technology and dialogue and whether we can truly create dialogical spaces within digital environments. Corazza leads us to reflect on whether a dialogue on a digital communication medium in which the involved actors include artificially intelligent machines - could this still be an *authentic* dialogue? No doubt, these are interesting and important questions to address.

When taking a dialogic approach to education with ICT, this includes a variety of tools, and artificially intelligent machines are included in such tools. According to Wegerif (2019) AI makes us consider how we can incorporate the alienness of this technology into an expanded dialogue – in the end, we must consider how to expand what it means to be human, to be us. In addition to be a philosophical question, this is also an educational challenge.

Dialogic education can open up and broaden dialogic spaces within digital environments through the potential in bringing students across cultural and geographic differences together using the internet for instance, and also scaffold dialogues using synchronous and asynchronous environments (Wegerif, 2007). Still, the question still remains, can we foster true dialogues in spaces when we actually also miss the embodied presence of the other person and in some programs, present a stereotypical view of who the other is?

Vlad Glaveanu: These are both very thoughtful considerations of this ‘big’ question. As Corazza notes, this is not a question only for today but also tomorrow. Although I personally am highly skeptical about machines reaching human types of consciousness (perhaps it will be a different category altogether), I do appreciate that both old and new technologies, for as primitive or as sophisticated as they are, have always participated within and supported dialogue and, with it, the creative emergence of meaning. Ness, building also on Wegerif (2019), invites us to take this opportunity and reflect on what it means to be human in ways that expand our self-understanding. These are not opportunities to be missed, especially in education.

My personal view about this issue is that *both* human-human and human-computer interactions can be dialogical or non-dialogical (monological?). The distinguishing criterion, following a Bakhtin approach, is whether tension, emergence and novelty are embedded within the exchange. We can all certainly think of moments of communication with fellow human beings that are not described by any of these or, at the very least, these features are not dominant. In education, this includes interactions that are based purely on the transmission of information, normally from teacher to student, with no ‘creative openings’ or room left for wonder and uncertainty (Gajda, Beghetto & Karwowski, 2017; Glăveanu, 2020b). In contrast, the use of technology either as a tool for

communication with others or as an end in and of itself, can trigger moments of questioning, reflection and even awe (e.g., Chirico, Ferrise, Cordella & Gaggioli, 2018). The quality of 'dialogical', for me, is pragmatically in the action and not decided *a priori* by medium, actors, or message.

And with this we are close to bringing our own dialogue to an end. But, before we do, final reflections are in order. What has our own dialogue here about learning, creativity and technology (a dialogue that, by the way, is heavily mediated by technology!) teach us? What kind of surprises, tensions and questions did it help emerge? What did we each learn from it?

Ingunn Johanne Ness: Glaveanu indeed rises an interesting question above, what did this dialogue mediated by technology, teach us? Well, technology made it possible for us to engage in this dialogue and it has been very interesting to exchange thoughts throughout this chapter and to co-create a chapter together. Co-creation leads to understanding and according to Bakhtin (1986) this is something that emerges in relational dialogues as a response to utterances and I want to include a quote by Bakhtin:

"The word in language is half someone else's. It becomes one's "own" only when the speaker populates it with his own intentions, his own accent, when he appropriates the word, adapting it to his own semantic and expressive intention. Prior to this moment of appropriation, the word does not exist in a neutral and impersonal language... but rather it exists in other people's mouths, in other people's contexts, serving other people's intentions; it is from there that one must take the word, and make it one's own" (Bakhtin, 1981, p. 294)

According to Bakhtin it is through meetings with other perspectives and utterances, new knowledge occurs and it is in our seeking to understanding the alien, that we can learn something new. This is about creative understanding, according to Bakhtin (1986). To him, creativity and understanding is closely linked together. So, in this case, writing together and co-creating this chapter, the use of technology has worked as a tool for communication and triggered moments of questioning, reflection and new understandings. I have truly been inspired by Corazza and Glaveanu - and I agree with Glaveanu, that the quality of 'dialogical', is in the action and not decided *a priori* by medium, actors, or message. In the end, maybe dialogue should be seen as an end itself...

Giovanni Emanuele Corazza: I like taking pictures and sharing them. Perhaps this is one of the most positive affordances of social networks and chats, when used wisely. There is no equivalent experience to this instantaneous form of shared visual communication without the supporting technology developed in the last seventy years in telecommunications and computer science. But as I was reflecting on Glăveanu's final questions, it dawned on me that this multi-handed writing of a chapter could be metaphorically interpreted as the flash shot of a dialogue, wherein our opinions and exchanges become fixed on paper as they were expressed in the moment! And I imagine both Ness and Glăveanu smiling as they their fingers were frantically dancing on the keyboard...

An interesting idea, taking pictures of a dialogue... or was this rather a trialogue, as there are three of us involved? Actually, the word 'trialogue' was invented in 1532 by no one less than St. Sir Thomas More (Swidler, 1994), but it was later considered a misinterpretation of the etymology of dialogue, a mistake caused by breaking it down as di(*two*)-a-logue(*word*) instead of the correct dia(*across*)-logue(*word*). In other words, a dialogue can involve two or more people. However, we shouldn't throw away the provocation of the trialogue too fast. In fact, anyone involved in creativity studies knows that 'errors' are actually the door to ideas that have a potential for great originality and effectiveness, perhaps emerging only a-posteriori (Corazza, 2016)! Let's take seriously the strong push towards tri-partite entities that is carried by Thomas More's trialogue.

Indeed, we live in a world dominated by dualities and dichotomies, analyses and cultural disputes are almost always dominated by two opposing sides. It would therefore seem that human understanding is greatly helped by working in between two extremes, in a bi-dimensional world. Given that our physical reality is three-dimensional, it is a very reasonable simplification, but also a clear reduction. How would our cultural discourse evolve if we were to systematically introduce 'trialities' and 'trichotomies' as fundamental frameworks for understanding? A question that is best left unanswered until our next trialogue with Ness and Glăveanu!

Vlad Glăveanu: Our trialogue is coming to an end but, in the good tradition of dialogical creativity (Ness & Glăveanu, 2019), the end is merely the beginning of new processes of meaning-making, reflection, and continued action. The metaphor – and reality – of the dialogue applies to this entire volume. As an edited book, it already includes a polyphony of voices, perspectives, and author backgrounds. More than this, as each chapter focuses on provocations, they necessarily have to cross temporal, conceptual, and disciplinary boundaries. The 'inner' dialogicality of every contribution is enhanced by the fact that you, as a reader, can decide on your own path through the book, including any detours and back and forth movements you want to make. In this way, your own reading will recreate the space of possibility this volume aims to inspire and imagine new futures for learning, creativity, and technology.

Our 'task' here was to illustrate how an open-ended, playful dialogue taking its point of departure from the contributions included within these covers can lead to new questions, questions to which you surely have answers of your own. In many ways, this last chapter is meant to be a new opening, rather than closing, of the range of creative provocations showcased here. Some of these dilemmas have been around for a long while, others we are beginning to discover today, prompted by a unique societal and global context. The story of the links between creativity, learning and technology is certainly very old as it arguably goes back to our emergence as a tool-using, tool-transmitting, and tool-inventing species (Festinger, 1983). But what we learn and how we create with technology remain important questions that will only become more visible and more pressing over the next years and decades. And so the dialogues, debates and provocations around these themes will also intensify. We are grateful for the opportunity to contribute to a book that marks an important moment in this evolution.

Here's to the future and to the next opportunity to engage in creative trialogues about it!

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Author bios

Vlad Petre Glăveanu, PhD, is Associate Professor and Head of the Department of Psychology and Counselling at Webster University Geneva, Associate Professor II at Bergen University, Norway, and Director of the Webster Center for Creativity and Innovation (WCCI). His work focuses on creativity, imagination, wonder, culture, and human possibility. He is author of *The Possible: A Sociocultural Theory* (2020) and *Creativity: A Very Short Introduction* (2020), with Oxford University Press. He is the founder and president of the *Possibility Studies Network* and editor of the upcoming Sage journal *Possibility Studies and Society*, as well as the upcoming book series *Cambridge Series on Possibility Studies*. He received in 2018 the Berlyne Award from the American Psychological Association for outstanding early career contributions to the field of aesthetics, creativity, and the arts.

Giovanni Emanuele Corazza, PhD, is a Full Professor at the Alma Mater Studiorum University of Bologna, President of the Fondazione Guglielmo Marconi, founder of the Marconi Institute for Creativity, Member of the Marconi Society Board of Directors. His research interests are focused on the development of the Dynamic Creativity Framework. He was Member of the Partnership Board of the 5G Infrastructure Association in the years 2013-2018, Member of the Board of Directors of the University of Bologna in the years 2012-2018, President of the CINECA consortium for supercomputing in the years 2017-2019, Head of the Department of Electronics, Computer Science and Systems (DEIS) in the years 2009-2012, Chairman of the School for Telecommunications in the years 2000-2003, Chairman of the Advanced Satellite Mobile Systems Task Force (ASMS TF), Founder and Chairman of the Integral Satcom Initiative (ISI), a European Technology Platform devoted to Satellite Communications.

Ingunn Johanne Ness, PhD, is a Senior Researcher and leader of the theme Creativity, Learning & Technology at the Centre for the Science of Learning & Technology (SLATE), University of Bergen. She is an expert on learning and creativity in the field of education and business with a particular interest for dialogical pedagogy and the sociocultural approach. She works with one of the world's leading environments on sociocultural theory, the OSAT group at the University of Oxford and has close collaboration with Webster Center for Creativity and Innovation in Geneva. She is a member of the International study of Creativity and Innovation (ISSCI) and has a number of publications in International journals and Handbooks.