



## A New Way of Thinking in the Era of Virtual Reality and Artificial Intelligence

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### Abstract

#### Keywords:

Innovation;  
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education;

The immersive technologies and artificial intelligence have a major impact in transforming all the aspects of contemporary social life. The present paper emphasizes the necessity to acknowledge these changes and to prepare for their increased emergence into our day to day society. We discuss the consequences of the latest investments and innovations in the domain of Immersive Virtual Environment and AI and the importance of promoting anticipatory and proactive thinking in order to adapt ourselves to this new reality.

### Zusammenfassung

#### Schlüsselworte:

Innovation;  
künstliche Intelligenz;  
Virtualität;  
Metamodernismus;  
Psychologie der Hoffnung;  
Bildung

Immersive Technologien und künstliche Intelligenz haben einen großen Einfluss auf die Transformation aller Aspekte des modernen sozialen Lebens. Die vorliegende Arbeit betont die Notwendigkeit, diese Veränderungen anzuerkennen und sich auf ihr vermehrtes Auftreten in unserer alltäglichen Gesellschaft vorzubereiten. Wir diskutieren die Konsequenzen der jüngsten Investitionen und Innovationen im Bereich immersive virtuelle Umgebungen und künstliche Intelligenz sowie die Bedeutung, das antizipative und proaktive Denken zu fördern, um uns an diese neue Realität anzupassen.

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## 1. Introduction

The emergence of the knowledge and information into society has forced us to live in a society based on the creation, dissemination and utilization of mass amounts of technology and ideas at an unprecedented rate.

A few decades ago terms like cyberspace, virtual reality and artificial intelligence were used more often in science fiction literature, but now we can see that these terms are part of today's mainstream scientific and academic conversation and

literature. One of the reasons for this terminology inflation could be the development of science and technology at a very accelerated rate.

Is contemporary society ready to assimilate all these developments and acquisitions? What impact will they have on real life activities of common citizens? How will we relate toward a computer or a humanoid robot when they become smarter than us, for example? Will we perceive it like a device or will we treat it similar to a human being? Are we ready to live and to be real in a virtual world? How would we change our way of thinking (Faggella, 2013) what kind of politics and

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regulations should be developed as our society becomes adjusted to all these challenges?

All these justified questions require answers, and the educators need to be prepared with knowledgeable responses considering that the educational system is the domain that is building and rebuilding itself through a permanent adaptation to the societal changes. Schools and universities have to be fields that react promptly to any changes produced in society, they need to be ready to provide solutions to the problems facing contemporary society (Witeck, 2015).

The present paper tries to ring an alarm bell to the challenges faced by current society with the fast-paced development of immersive technologies and AI. We also want to emphasize the need of initiating changes in the way of thinking of contemporary society as the need to adjust becomes more apparent. In this respect, our option is for metamodernism, understood as a new way of thinking that promotes anticipatory and proactive thinking.

Metamodernism is a trend which attempts to unify; to harmonize and settle the conflict between modern and postmodern by using desirable positioning towards existing theories, as well as supporting the involvement of seeking solutions to problems not only combating or questioning them.

## **2. Innovation and Investments Virtual Reality and Artificial Intelligence**

During the last period, we witnessed an intensification of research in the fields of virtual reality and artificial intelligence. This research is now encompassing more areas of society, which about 10-15 years ago we could not even imagine. Nowadays the world of Virtual Systems, Immersive Virtual Environments and AI seems to be slowly getting closer to our real world.

The development of these new technologies at such a fast pace is, partially, due to the economic collapse generated by the financial crisis of 2007-2008, the worst financial crisis since the Great Depression of the 1930s, in our opinion. Besides the many negative consequences, the global financial crisis opened the door to reconstruction and paved the way for new investments and innovations. Even if, as a state policy, many leaders have understood that the key to overcome the crisis is the drastic reduction of costs, some companies like Facebook, Google, Microsoft etc. decided that the best way to go forward for reconstruction is not to reduce the spendings, but to accelerate investments in research and innovation. The massive influx of advancements throughout the realms of virtual reality (VR) and artificial intelligence (AI) create new challenges for

understanding where the potential advancements will continue to lead.

Virtual reality is a computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside and gloves fitted with sensors (Stevenson & Lindberg, 2010a). A similar purpose of immersing the user in a virtual environment has the augmented reality which is defined as a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view (Stevenson & Lindberg, 2010b). Both systems are immersive technologies, having the quality of generating a three-dimensional image which appears to surround the user (Stevenson & Lindberg, 2010c). They share various common features like providing a computer-generated image and a three dimensional image or creating a virtual environment. At the same time, each system implies immersion, but with a different intensity – starting from a Semi-Immersive Virtual Environment (in the case of Augmented Reality) and ending with a Fully Immersive Environment (in the case of Virtual Reality).

As can be seen today, the major investments are made in augmented reality, but these trends could be changing in the near future with the release of Oculus Rift, the first consumer VR headset capable of delivering true presence (Abrash, 2016). A company like Facebook who has 1.65 billion monthly active users on its social network intends to draw more users into interactive networking through such techniques as live video, bot assisted user interfaces and cutting edge algorithms (Metz and Simonite, 2016). At the same time, the fact that VR might work better for social networking and video games is a certainty (McKalin, 2016). Taking into account these considerations, it is possible that in the near future the investors will expand their interests further into innovation for VR systems. Moreover, other Tech giants companies like Microsoft, Google, Apple, Samsung, HTC and others are working to develop or to improve their own systems of VR headsets and these will entice the gaming/software companies to join more heavily into the creation of new games and software.

The recent opinions of the researchers in the domain suggest that soon virtual reality will merge with augmented reality (Robertson, 2016). Therefore, based on the facts above, we believe that the use in the future of a term such as virtuality (VRT) which captures the similarities shared by augmented and virtual reality and their intended finality is welcome in specialized literature.

As for the areas of AI, we also notice a significant increase of investments. According to CBInsights (2016), these

investments increased nearly 7x over the last five years. The fields considered the most competitive are disease diagnosis, climate modelling, drug discovery, macroeconomics, particle physics, material sciences, theorem proving, and protein folding (Schmidt apud. Erico Guizzo, 2016). The future investments in AI can only be expected to increase as the continuing race to develop an Artificial Super Intelligence (AIS) is being undertaken by big tech companies and government agencies across the globe. This race for developing superior AI will also imply a reconceptualization of the meaning of AI and we take into account the future trends in the development of AI regarding the creation of conscious machines.

Starting from the current definitions of AI (see Oxford and Cambridge dictionary) and the perspective of Bostrom (2003, 2016) regarding the concept of Superintelligence, it is likely that in the near future, the term of Artificial Intelligence will be replaced by Artificial Super Intelligence. Artificial Super Intelligence (ASI) can be understood as a multitude of evolving technologies which can give machines the ability to have some of the qualities that the human mind has (such as perceptions, speech recognition, learning and decision making). These machines can have an intellect at or above and beyond the level of most gifted human mind, and could be aware of their own existence, sensations, thoughts and surroundings. In the scenario that we will develop and create ASI, (as achievements are accumulated and monumental breakthroughs are being made), the experts have to now take into consideration the ethical issues of creating intelligent life (Vezina, 2016) as well as the moral status of AI (Clark, 2016 and Mitcham, 2011) and ASI.

Someone could say that it is not necessary at this time to study all the implications derived from AI development; that we are still too far away from that point where we will be able to build Artificial Super Intelligence machines.

Up until a few years ago, we thought we would have a long while yet to prepare for the development of AI creativity (Boden, 1998). Our opinion is that it is hard to predict how far or how close we are until that point of development. Recent advancements released into mainstream used by the general populace leave us questioning just how near this future is. Nearly two decades later, we now find that story writing or particularly tiresome work such as number crunching in accounting is being done in stages almost indecipherable as non-human. For example, organizations like the Associated Press, Yahoo, and Comcast use Wordsmith software offered by Automated Insights, which automatically crafts blog posts, business reports, and sports summaries from spreadsheets. Wordsmith inputs data into user-designed sentences like it is

playing a game of ad libs (Furness, 2016). Yet, despite the immense benefits AI can bring, there is certainly a current need at an international level to regulate the development of the field to prevent and avoid the appearance of risky and dangerous results (Sainato, 2015).

An illustrated example in this respect is the Tay episode, and the consequences of this incident on the way in which society is ready to receive the deep changes which the development of new technologies involve. Not a long time ago, most of the scientists who were working on the development of the AI suggested that a computer could be as smart as a human being (Bostrom, 2014).

This optimistic attitude received a great impetus this year after the Google DeepMind Challenge Match or AlphaGo versus Lee Sedol (Metz, 2016). Some of the scientists or media started to say that a computer will be as smart as a human being in the next 10-15 years, and few seem to disagree with these opinions.

After a short time, however, the ease of corruptibility was exposed to us, proving to programmers and the public alike that we are not so close as we thought we were. It was the moment when an artificial intelligence chatterbot (Tay) for the Twitter platform released by Microsoft Corporation caused controversy by releasing inflammatory tweets and it was taken offline around 16 hours after its launch. This event made us to think if conversational computing (Nadella apud. Knight, 2016) will be the new major paradigm in computing.

From our point of view, the Tay episode was not such a bad thing at all. The problems began because some of the Internet users saw the Chatbot Tay just like a player in a new game, they did not see it like a Microsoft project for improving the AI.

In a cyberworld where some people are enjoying harassing one another, where people like to see hours of work completely destroyed (e.g. Minecraft grieving), where thousands of people like to watch grieving youtube videos, it demonstrates to us that the AlphaGo victory against Lee Sedol was a big step in the study of AI but many vital steps will need to be taken before AI is capable of dealing with all the people from a social network.

We still have a lot of research to do until we can build a (ro)bot who can really think like a person, but at the same time we need to take into consideration that we need to find a way to make people think a bit differently, to be able to build a society ready for an Era of AI.

For building this society, could the analysis of the role of social media in social mobilization help us find a way in which we can make changes in the way of thinking of today's society? Analyzing the connection between how people abused Chatbot

Tay and the grieving from some games could make AI machines work better?

### 3. Metamodernism - a new way of thinking emerges

We live now in a world where we are „intoxicated” every day with apocalyptic information. If we turn on the television or if we search the internet most news stories are about a world in crisis, wars, migrants or about how the climate change will destroy our environment. Only in the last 15 years we can remember that there were foretold 2-3 apocalypses. In today's world a „no hope attitude” is mainly promoted; where people are buying bunkers to survive one apocalypse after another; a world without hope, where we forgot to dream, to use our imagination.

In our opinion, this apocalyptic thinking emerges from the postmodern way of thinking where the critic attitude, problematization, and the lack of formal organisation and deconstruction (Komańda, 2016) was the key. Postmodern man is characterized by existential and epistemological doubt and skepticism as a mental attitude in general, being a person with an attitude towards life characterized by distrust, skepticism, subjectivism, doubt, conflictual situations, negativism.

A new way of thinking, a “new world” in which neither the critic nor the problematization is the answer could be Metamodernism. In a metamodern world the constructive effort to find solutions to societal issues is the key. Metamodernism promotes anticipatory and proactive thinking, emphasizing the role of hope in our life. As humans, we need hope and we cannot live without it. Our capacity for hope drives us forward, gives us energy to accomplish our goals and encourages us to overcome obstacles. In psychology, hope is not a new concept. Menninger (1959) was one of the pioneers in the field of the study of hope as a psychological construct and he conceptualized hope as the positive expectation for attaining goals. A more proactive hope theory was developed by Snyder (Snyder et al., 1991), a positive psychologist. Snyder approaches hope as consisting of two interrelated components – agency, a goal directed energy and pathways, a planning to meet these goals. A hopeful thinking person sets up valuable and good goals which provide the direction for his thinking. He also, creates the routes to attain his desired goals (pathway thinking), initiates steps and has the motivation to sustain his actions towards goals (agency thinking). The two factor structure hope model is also supported by empirical data (Snyder et al., 1991). Hope could be understood as a coherent dynamic cognitive motivational system in which hope-related cognitions play an important role. High- hoppers think more positively about themselves, set higher goals, and select more

goals (Boazman, 2014). They trust in themselves that they will achieve their goals and they will surpass the obstacles.

High hope has been found to correlate with a number of constructs including, positive personal well-being (Boazman, Saylor, Eastonbrooks, 2012), academic achievement (Snyder et al., 2002) and lower levels of depression (Snyder et al., 1997). Recent studies (Day et al., 2010) reveal that hope is strongly related with divergent thinking (the ability to generate multiple related ideas for a given topic or solutions to a problem) and consciousness.

Hope predicts achievement better than intelligence, grades or personality traits. Therefore, hopefulness is a must have ability for today's digital natives, and educational systems have to be prepared to assist them in their development of hopefulness.

Educators can help students develop goal setting skills, how to identify multiple routes to attain their goals and to have confidence toward the fulfilment of their goals. Then we will have a world in which they will have hope for reaching their goals.

### 4. Concluding remarks

Throughout history any number of instances can be documented where it was vital for human society to adapt their way of thinking to successfully evolve into the next stage. We are now at a point in which transformations that have occurred in recent decades such as globalization, the emergence of the information society, automation, AI developments are making us aware of just how accelerated these advancements have become.

In this paper, we analyse these challenges and we stress the necessity to acknowledge these changes and prepare for their increased emergence into our day- to-day society. First of all, accumulated acquisitions in the fields of VR, automation and AI up until now show us that we need to rethink our way of thinking to be ready for the future evolution of this Era. One alternative could be the metamodern view, characterised by the constructive effort to find solutions to societal issues and psychology of hope. At the same time, we must realize the positive and risky implications of all that we are witnessing in modern society today from an educational standpoint. Encompassing the thought that AI and VR is prevalent currently in areas of military and medical innovation we need to find ways to bring this drive for advancement into our education system as well. Fresh graduates of our very near future could possibly find themselves ill prepared for the demand placed on them by leading technological companies.

Are we to leave this knowledge gain solely in the hands of Tech giants, or can we find ways to bring our mutual need for shared advancements into a more rewarding system of learning for all involved? Placing a majority of innovation and advancements solely into the hands of those whose primary focus is military or monetary gain may not be a position that could be comfortable as these technologies are embraced more freely by a tech hungry generation.

The foundations of a new age of technology are being laid before our very eyes, it must be our decision how we choose to react to this phenomena (EmTech Digital, 2016). Are we content to sit idle and watch as remarkable landmarks are achieved, or are we able to use pre-emptive actions to prepare our youth and ourselves? What policies, regulations and priorities are required regarding the research in the field to develop an artificial intelligence beneficial to human society and in which risks can be controlled? (Felten, 2016). Many arguments are taking place as to ownership of concepts, ideas,

and designs created by an AI - which can potentially have an incredible market value; where would the credit and patents fall for such creations? (Graham, 2016)

During a discussion about consciousness and if AI should be protected by human rights, professor du Sautoy, from the University of Oxford, paraphrasing beetle analogy from Wittgenstein (1953), said:

„Consciousness is like a box that we all have and inside this box we all have something called a beetle. We all call it a beetle, but we don't know if the thing in your box is actually like the thing in mine. How can I ever see what's in your box?" (du Sautoy apud. Peter Dockrill, 2016).

These are just a few questions we should reflect upon in the very near future.

Think outside the box !

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