
Technologised Epistemology

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1 Introduction

Technologised epistemology is a type of naturalised epistemology that is interested in the process of knowledge acquisition and transmission, and looks upon cognition as well as its results as psycho-social phenomena; changeable and dependent on manifold circumstances particularly technological ones. It considers cognition and knowledge as mediated by tools, instruments and communication media, as well as putting important epistemological questions in that context: Does technological mediation really change the nature of knowledge (from individual and subjective to dispersed and impersonal)? Does it subsequently make the knower, sender, or receiver (who become anonymous and depersonalised agents) more effective but less rational, responsible, and reliable? Does knowledge in such cases cease to be true and justified? Who is the agent – the individual person who introspectively experiences their own subjective mental states, or the networked group of individuals who participate in commonly shared (but impersonal) knowledge?

At the same time, technologised epistemology is confronted with the same – unavoidable as well as troublesome – traditional problems of uncertainty, unreliability, and falsehood. It shares the same characteristics (i.e. meta-theoretical, normative analysis of cognition and knowledge) by which traditional epistemology is still identified. Its interest in cognition's

instrumentation nevertheless reveals new tendencies to which cognitive and communicative phenomena are increasingly subjected. It is also obliged to answer the old epistemological question of how reliable knowledge (data-bases, the news, public opinion, or any type of information and knowledge exchange) might be gained if the means of its gathering, processing, and conveying are technologically mediated to such an extent? New tendencies oblige epistemologists to think over anew the problem of normativity, understood in the paper in two ways: (1) as values, norms such as truth, evidence, certainty, reliability etc. (properties of beliefs used in the agent's evaluation acts); and (2) prescriptions and rules telling how to obtain true (as well as how to avoid false) cognitive results (taking the form of imperative, normative sentences). The problem how values such as truth or evidence undergo changes, not only in their linguistic meaning but in their factual content, is worth discussing.

2 Increasing knowledge naturalisation

"Naturalising" does not assume only one particular form – several versions of it can indeed be found in the history of philosophy. It concerns both objective and theoretical levels of knowledge (I shall analyse them in sec. 6); in other words, the term "naturalisation" applies to processes and tendencies constituting knowledge as well as to the theories which describe and postulate new epistemology. Naturalisation occurs in many areas of human cognitive and communicative endeavour. It is, generally speaking, the intellectual consequence of the many changes that took place within philosophy as well as in Western culture and modern European societies at the turn of the eighteenth century.

Naturalisation in a broad sense, as I want to define it, concerns, to a varying degree, several things: (1) the *real processes of cognition* (natural human faculties and abilities, perceptive or intellectual) improved and facilitated by different instruments and media of communication; (2) the psycho-social *position of an agent* (involved in technological endeavours and communication with other human beings or machines) as well as the *epistemologist* who provides analyses of naturalisation; (3) a *subject of knowledge* (real and objective things, events, and processes as well as virtual and fictional phenomena); and (4) the *knowledge justification* procedures (scientific and commonsensical) negotiated and constructed by agents who obtain as well as evaluate knowledge. These characteristics

may be treated as a general model describing how naturalisation takes place in commonsensical knowledge, public opinion, and science. Naturalised epistemology is then, firstly, a theoretical view-point that reduces epistemological analyses to science, especially to psychological studies. But one can also treat knowledge naturalisation as, secondly, an objective process which human cognition and knowledge (not reduced exclusively to science) have undergone in the last centuries and decades, and which have been taking place in science and public affairs. Taking this into account, I suggest that the above characteristics fit very well with the tendencies that are analysed by technologised epistemology.

With the beginning of the so called computer revolution human cognitive processes and knowledge have changed their nature, as its theorists maintain (See Bolter 1984; Sloman 1978), becoming more dispersed and impersonal, but at the same time less reliable and comprehensible. These socio-cultural tendencies are now a challenge for epistemology. Technologised epistemology, unlike traditional epistemology, ought to provide a theoretical description of cognitive phenomena (especially mediated cognitive phenomena) and an evaluation of the cultural changes which human cognition and knowledge are increasingly subject to. It may, on the basis of case studies and historical investigations, provide forecasts and long-term predictions concerning knowledge development, particularly the tendencies observed in science, public opinion, or mass communications. These predictions, being neutral, objective, and self-correcting (science-based) evaluations, may be treated as normative. Not in the traditional meaning – as following arbitrary epistemic rules that are presented as objective – but in a more realistic and critical way, as value-related epistemological analysis.

3 Normativity in the broader context

Epistemic norms, to put the problem generally, are the result of the manifold human endeavours, properties of individual agent beliefs used in their evaluation acts. Such norms as truth, evidence, certainty, reliability lead human achievements. But they function in a context much broader than just the cognitive (individual or subjective). All norms and values originate from human processes or acts of evaluation, and function not only internally but externally, as well. They are the results of effective human efforts undertaken in order to achieve some cognitive goals. These

goals look for their manifold completion or fulfilment. The agent's satisfaction called certainty is mainly ascribed to the gained knowledge, while unsatisfactory beliefs are deemed mistaken. Most of the goals are in fact collective, not individual, and many social influences are reflected in them. It cannot be denied that evaluating (i.e. ascribing significance to things or events) is a more substantial human activity than any cognitive process. This is the case because perception (visual evidence) as well as thinking (conceptual evidence) or conveying what is conceived as a true justified belief (its truth *per se*) are usually undertaken in the course of deciding or estimating what is good or wrong. Truth as obviousness, perceptual or intellectual, is then a value or norm that emerges through perpetual human evaluative and normative endeavours that, I wish to argue, are prior to the generalised norms themselves. The norms are, therefore, the cultural embodiment of individual and social understanding that people acquired through trying to experience a variety of things. This can be observed not only in science, where truth plays the crucial role, but also in areas of commonsense knowledge or public opinion, as well as in communicational behaviours.

Because of its introspective and subjective concept of 'the knower', traditional epistemology usually did not take the above perspective into account. As most of epistemology's concerns (i.e. agent's identity, scope and limits of knowledge, concept of truth and evidence, etc.) were traditionally considered within the internalistic (introspective) framework (in the first-person perspective) any solution to the problem of norms usually took the form of an absolute. Epistemic norms and values were conceived as the final goals of personal cognitive acts; they preceded, not followed them. But since Cartesian-Husserlian epistemology has been critically reconsidered many times, a new perspective has been developed. Externalism (See Bonjour 1994; Goldman 1995; Ziemińska 1998) re-evaluates all epistemic concepts and issues, including the problem of normativity. But there is a number of noteworthy ways in which this change is realised.

Socio-historical epistemological studies are one of the currents of externalism, and Alvin Goldman's veritistic epistemology (situated in the analytical tradition) plays the crucial role therein. Goldman says that veritistic epistemology, "a specialised subject, analogous to environmental studies and nutritional studies", deals with special social values, a circumscribed kind of things that people and institutions take into account.

"Veritistic epistemology is such a special field, where the selected good is knowledge and the selected bads are error and ignorance. [...] It has the distinctive *normative* purpose of evaluating or appraising such practices on the veritistic dimension, that is, in terms of their respective knowledge consequences. Practices currently in place will be veritistically good or bad in varying degrees; they will rarely be ideal. To investigate prospects for improvement, social epistemology must be prepared to transcend previously realised practices. It must be ready to consider the probable veritistic properties of practices that have not yet been, but might be, adopted." (Goldman 1999: 6–7) Social practices which play a role in evaluating some achieved cognitive results as true beliefs, constitute certain goods as true or false. They are then the subject of epistemology's meta-theoretical analyses (veritistic in their nature). This obliges, if not compels, the epistemologist to take the role of "the disinterested participant of analytical social epistemology, which aims to acquire knowledge first-hand above all else" (See Fuller 2007: 110).

Steve Fuller goes much further in his critical analyses of the problem of normativity. His externalist approach takes into account social circumstances as important conditions for knowledge making and evaluation. What matters is not only the scientific methods and results but also the social and public strategies and policies ("knowledge regimes"). Epistemic norms emerge in the course of knowledge production and distribution; they do not function independently of the social situations which generate them. Fuller holds that "Social epistemology's normative concerns largely reflect the bureaucratic context of modern resource-intensive 'big science'. It situates the points of critical intervention not in the laboratory, but in the policy forums where research is initially simulated and ultimately evaluated. Part of this shift is due to the gradual demystification of scientific work that has attended the rise of science and technology studies. [...] Another part of the story is the increasing realization that bodies of the knowledge can be evaluated, not merely in terms of their conception, but also in terms of their consequences. Given the increasing access to resources that science commands, research has become – if it was not already – both in investment opportunity and a public trust." (Fuller 2007: 110) In other words, epistemic norms and values originate and function in the context of social structure and public opinion, not only in individual activity. Their status and importance are due to the constant change and re-evaluation that takes place outside philosophy.

One consequence of this is the change that occurs at the meta-theoretical level. It concerns the position of the philosopher providing epistemological analyses (See part 2, point (3) above). The epistemologist becomes “the interested non-participant in the knowledge system”, as Fuller puts it (this position is opposed to that which was ascribed to Goldman). This happens that because “interest in knowledge policy is grounded in the idea that, generally speaking, the *prescribers* and *evaluators* (or, respectively, *legislators* and *judges*) of knowledge production are not the same – in terms of identities or interests – as the first-order knowledge producers. Knowledge serves as a means to other human ends (which themselves may be epistemic) but one's participation in the knowledge process is usually confined to the meta-level of inquiry, that is, the design and evaluation of knowledge production regimes that *others* carry out. [...] Thus, the social epistemologist's position is, generally speaking, *rule-utilitarian*: if the people subjected to an epistemic regime can live well with its consequences, then that is success enough. [...] A progressive knowledge regime institutionalizes both the exploration and the criticism of alternative research trajectories.” (Fuller 2007: 110–111) Finally, one can say that the problem of normativity which epistemology deals with lies in the fact that knowledge (as any other epistemic concept and value) is indispensably intervolved with social phenomena that influence it. Technology and social or political practices and infrastructures (i.e. information and computer technologies) that enable wide and pervasive knowledge functioning in a social structure, have to be then the subject of epistemology's interest.

4 What do knowledge and technology have in common

The traditional perspective on knowledge considers it as the idealised result of an agent's individual cognitive efforts which ought to be realised in one particular way. The agent has privileged, introspective to this knowledge and there is no demand for any external means of mediation or improvement; indeed, such options are excluded. The issue of the circumstances that accompany the cognitive acts or influence their results is either omitted or treated as a serious and troublesome epistemic obstacle.

Nobody will deny that knowing means doing and making, at the same time. Most of our ordinary cognitive acts are involved in various practical activities. Only certain, very simple and evident cognitive acts, such as

perceiving objects around us, may be actually realised without any assistance or help from instruments or tools. In order to be acquainted with more distant objects that are more distant or which are somehow obscure, we must use a variety of instruments for observation, differentiation, calibration, preparation, modelling, simulation etc. Most scientific or common cognitive activities executed by people looking for knowledge are based on the tools and instruments they use deliberately. In other words, cognition and knowledge in their substance are tool-related human activities.

Does an instrument- and tool-related cognitive activity really mean a new epistemic situation which requires a new (technologised, as well as social or cultural) epistemology, however? In what sense and to what extent is the instrumental involvement of human knowledge really the subject for epistemological meta-theoretical level of analysis? Considering that complex, reciprocal relations between knowing and doing are obvious in our everyday life (in pre-theoretical experience), why is this such a controversial and troublesome issue for traditional epistemology? Why should a new theoretical perspective arise from studying these connections? There are, in my opinion, a few important reasons why we can believe that and, respectively to these facts, try to sketch the concept of technologised epistemology. One needs only to state precisely what is the area of interest and study; in short, how, where, and why is knowledge (beliefs, opinions, information, databases, the news, etc.) constituted by the technological means of processing, conveying, gathering, and improving it.

But what do we mean by ‘technology’? Which of its epistemic aspects could require a new epistemological perspective? Human activity is simultaneously practical and cognitive. Both sides of human life involve the tools, signs, symbols, and language that serve as its instruments. Only in very specific situations are people not compelled directly or urgently to use some instruments, and then we may rely on what we perceive, imagine, memorise, or think immediately. Subjective, intensive and seemingly evident experience is traditionally treated as pure, unmediated cognition that possesses the special epistemic value of being “uncontaminated” by the use of instruments and tools. As such, it is still the ideal for traditional epistemology. But even though this cognition model describes mathematical knowledge very well (yet, there are branches in mathematics where computers are used to obtain proofs of theorems), it does not func-

tion in other areas of human knowledge (i.e. natural sciences) where facts and events are brought into the light of scientific interest thanks to instruments and communication media.

Technology is the use of various tools for achieving various practical goals, including cognitive ones. But knowledge is entangled in practical human activity in two ways: as (1) a result of using instruments and tools when new information is gathered or processed thanks to the technological support; and which couldn't be achieved by other means (such as pure intellectual reasoning); (2) a starting point when new technological instruments or inventions that constitute so called information infrastructure emerge thanks to intellectual scientific discoveries (i.e. computers and information technology as a result of mathematical discussions on algorithmic computability). In other words, technology is the application of knowledge (commonsensical, scientific, or other) that brings about and controls human activities, as well as the production of knowledge that is otherwise unobtainable. It is for this reason that any type of technology is characterised by its intellectual ingredient.

The essence of modern technology is its collective functioning within society. It is the production, engineering, and management of material things, where information processing and conveying is substantial and constitutive. Knowledge (information) and its technological involvement function within the social structure, at the same time being an important aspect of its change and development, as many theorists hold (See Laver 1989; Hughes 2005; Baird 2004; Lash 2002). There are still many human collective endeavours and types of experience in which sophisticated and complex technology systems constitute new kinds of knowledge unachievable without them. These new phenomena, considered on the epistemological level (by description and by normative evaluation) open new intellectual horizons, but at the same time imply novel and paradoxical theoretical problems.

5 Telepistemology – new facts and new theory

The consequences of technology – the good or bad results it may bring about as well as the optimistic or pessimistic opinions (both overestimated, as is usually the case) it may lead to – are neither unknowable nor evident. They require our ability to recognize what is hidden under technology's spectacular achievements and apparent successes. Sophisticated

and complex information technologies that pervade our lives must be constantly subject to investigation and critical evaluation, and this is the task for technologised epistemology.

Some of these issues may be dealt with by a *telepistemology* that emerges from recent technology and art performances¹ described in Ken Goldberg's monograph (See Goldberg 2000). "Access, agency, authority, and authenticity are central issues for the new subject of telepistemology: the study of knowledge acquired at distance. [...] Although epistemology has lost primacy within philosophy, each new invention for communication and measurement forces us to recalibrate our definition of knowledge. [...] Telepistemology asks: To what extent can epistemology inform our understanding of telerobotics and to what extent can telerobotics furnish new insights into classical questions about the nature and possibilities of knowledge?" (Goldberg 2000: 3–4) It approaches both the technical and the moral questions that arise from these new phenomena: Do telerobotics and the Internet really provide us with knowledge? Is it reliable knowledge? How should we act in the technologically mediated environment? How does our sense of agency change? Hubert L. Dreyfus, following Descartes' line of sceptical argumentation toward perceptual knowledge, admits that the rise of technologically mediated communication and knowledge confronts us with the same old epistemic situation: why and how to believe mediated experience, and how to cope with sceptical arguments? "And if telepresence became ubiquitous and we became dependent on electronic prostheses to mediate *all* our relations to the world, the epistemological questions that troubled Descartes and three centuries of epistemologists could again come to seem, not just intelligible, but disturbing." (Dreyfus 2000: 55) This situation compels us to answer anew the old pragmatists' question of whether our relation to the world should be that of a detached spectator or an involved actor? If there are serious reasons to doubt the authenticity and reliability of Internet communication or highly mediated mental representation that are so easily experienced, how are we to dismiss scepticism? If our background trust is missing, Dreyfus continues, we might be suspicious of the trustworthiness of every type of technologically mediated cognition and, what would be the worst, all mediated social interactions; our life would then become unbearable.

¹ <http://goldberg.berkeley.edu/garden/Ars/>

A similar perspective is considered by Catherine Wilson who investigates the consequences of the 'telefictive experience', 'proximal experience', and 'mediated agency' for the newest scientific, cultural, and ordinary endeavours. For her, these phenomena show that the old, constant bifurcation (traceable back to Greek theories of tragedy) that one can find in human experience between 'here' and 'away' is still operating and takes the form of dramatic self-awareness. "My central claim is that human ability to distinguish simulacra from real things and simulations from real events, has been made to carry too much psychological weight. [...] The real world and fictional worlds are not emotionally, psychologically, or morally insulated from each other [...] our everyday experience is permeated by the fictive. If we see fictive modes – including imagination and fantasy – as weakened forms of what I will characterize as *telefictive experience*, we obtain quite different results from the standard theories." (Wilson 2000:76) People using internet mediated instruments and performing actions at a distance are confronted with very specific and unique situations. Their subjective experience, being technologically mediated to such an extent, changes itself as do their remote actions. Nobody is the same subject after being involved in internet communication, where they realise an increasing number of their activities. "We can nevertheless venture the claim that, to the extent that an agent is screened off from the proximal experiences that would otherwise accompany his agency, his agency appears to us to be remote. Conversely, to the extent that experience is screened off from the possibility of agency, it is regarded as remote." (Wilson 2000:78) In other words, the nature of agency becomes more and more complex and not evident even to the agent; as such it is a challenge for the new type of epistemology as well as aesthetics.

In what sense, if at all, are technologically mediated cognition or communication trustworthy, and their results reliable? If they are fictional and misleading to such a degree, might it be impossible to ascribe to them such traditional epistemic values as truth, rationality, or reliability? However, the question seems to be still open, and there are approaches that try to solve it in the realist and critical way. Alvin Goldman's theory of causal factors in knowledge (his *no relevant alternatives* (NRA) approach) holds that whether a true belief is knowledge depends on the real reasons the belief is held, on the psychological as well as sociological processes that cause the belief and sustain it in the knower's mind as

knowledge. If the causes actually bring about particular beliefs, and if they are experienced by the subject, then the cause of such beliefs is only sustainable for reliable knowledge on the condition that "there is no relevant alternative on which the belief would be false" [REFERENCE]. The above circumstance of reliability may be extended to all cases of technologically mediated cognition and communication, especially those provided by the Internet. Even though they produce many apparent and obscure effects, they are of central interest to the theory of knowledge. As Goldman holds: "Telerobotically acquired beliefs raise interesting difficulties for the theory of knowledge. Unlike papier-mâché barns and boxes of thermometers, deception on the Internet is common. This implies that telerobotic knowledge may be deeply difficult to come by. Given that the threat of Internet deception is always present, can beliefs that are produced by telerobotic installations on the Internet satisfy the requirements for knowledge? The answer is not clear." (Goldman 2000:141–142) But what are the most important questions that arise from such new epistemic situations? Do they really concern only counterfactual cases (irrelevant alternatives) one can construct giving the technologically mediated communication? Do they concern their general reliability? What are other epistemological problems that one can put forward and consider?

6 Conclusions

The technological mediation of human endeavours and cognitive processes is the cultural fact that characterises the last few decades of the computer revolution since information technology has penetrated deeply and broadly into our lives. But mediation of human experience took place long before that and was introduced to facilitate many social and cultural exchanges, to mention only such examples as writing, print, the press, radio, or television systems of mass communication. In all of these cases of 'technologising' and 'making of the typographic man', human collective and individual experiences were mediated by the tools, instruments, and means of communication (See McLuhan 1962; Ong 1982). Thanks to these technological mediations new types of mentalities and minds, especially scientific thought, have emerged in European civilization, along with new kinds of social relations and structures. As McLuhan holds, "The use of any kind of medium or extension of man alters the patterns of interdependence among people, as it alters the ratios among our senses."

(McLuhan 1965:90) The linear, mono-causal, predictable, commonsensical and scientific ways of thinking, created concurrently with the rise of modern science by such inventions as the printing press, microscope, telescope, and mathematical calculus, gave rise to epistemology.

The Cartesian-Lockean model of the theory of knowledge (“considerations concerning human understanding”) as well as its other versions (e.g. Kantian, Husserlian) were in fact the theoretical implications of the instrumentally mediated knowledge gained in astronomy, physics, or geometry. But paradoxically, this knowledge has been misleadingly presented by philosophers as a domain of ‘pure reason’, as a result of an ideal subject who is free of any mediations which would only ‘contaminate’ his process of cognition. In this context - on the one hand, the real and successful instrumentally-achieved scientific knowledge and, on the other, the meta-theoretical analyses – traditional epistemology has emerged. Its ambiguous nature is evident as far as one discerns the two levels on which it realises itself: the *epistemic* (objective) – where real instrumental mediation has been appropriately recognised, and the *epistemological* (meta-theoretical) – where this phenomenon has unfortunately been obscured and refined specifically into the shape of a normative philosophical theory of knowledge. Both comprise epistemology as such, but the dominance of the later, making epistemology normative and taking it far from the social context of cognition, must be at present counter-balanced by more realistic analyses of what really happens when technology is involved in human cognition. In conclusion I wish to formulate several theses, some seemingly obvious and naive but which nevertheless have important consequences, by answering what technologised epistemology is or ought to be.

6.1. Organic vs. Artificial mediation

Only these technologically mediated human cognitive processes have meaningful epistemological consequences that produce really new epistemic situations. Mediation in human activity, both practical and cognitive, can be observed in the two ways it can function: (1) *organic* – when a human being uses parts of their body as well as very simple tools to perform ordinary cognitive tasks, and (2) *artificial* – when more complex, intentionally constructed, instruments and tools are used to circumvent natural limitations. Mediation is an indispensable precondition for almost

all human endeavours aimed at gaining knowledge. But only when mediation brings about effects that could not appear in natural (organic or very simple artificial) situations does it become an epistemological problem. In other words, the domain where epistemologically interesting new cognitive situations occur is much narrower than the areas of human activity where habitual mediation takes place; the former, being a sub-domain of the later, is of theoretical interest only in so far as it is set free from traditional epistemology’s restrictive assumptions.

6.2. Technologically mediated communication

Instrumentally mediated knowledge emerges in information technology systems where signals and signs characterising the objects and processes are encoded and transmitted between different material objects and processes. Information technology allows mutual and repeated coding (encoding and decoding) of any possible state of matter or energy, which people deal with in the physical world (excluding black holes or absolute zero temperature). It enables transition between analogue and digital information. Dematerialised strings of zeros and ones may be conveyed between different senders and receivers (human beings as well as machines) regardless of speed and place, making communication the form and matter of modern civilization. Technologised (i.e. computerised) communication has absorbed not only all previous means of communication such as the telegraph, radio, or television but also means of transport and ways of doing everyday things. Thanks to its effectiveness, almost everything becomes ‘networked communication’, including most human cognitive undertakings. Cognitive processes and their results are realised more and more on the Internet, which is the proper environment for them, giving them the opportunity for reciprocal exchange of information, signals, signs, and respectively symbols, intensions, thoughts, emotions, knowledge etc.

6.3. Simulations and Simulacra

Digital coding, implemented in computer systems, allows precise presentations of manifold aspects of reality. It makes scientific, as well as common, cognition and practice more effective. Models and simulations built on the digital platform are mainly presentations of non-existing and

imaginary worlds that come into existence through them. They are results of the pervasive penetration into the different levels of both micro- and macroscopic areas of the world. Thus, the question of their adequacy arises. If they are instruments of successfully conducted scientific or business endeavours that enhance natural cognition, are we really obliged, as traditional epistemology would have it, to evaluate them by asking the question of their truth or falsity? Simulation or modelling seem not to fulfil strict epistemic standards because they are tools for practical rather than simply cognitive tasks. If they work, help to solve important questions or open new cognitive horizons (while producing uncertainty), they are sufficiently adequate representations of investigated objects and events. Therefore, the epistemological question seems to be less important or urgent than the practical one. Still, this does not imply epistemic carelessness or assent to relativism. In the realm of simulations and simulacra traditional epistemological values and perspectives do not maintain their validity.

6.4. *Dispersed and Mythologized Agency*

As a result of technologically mediated cognition and communication, a new type of human experience emerges, especially in areas of intellectual endeavour where people are confronted with challenging situations such as described above. It would be naive and excessive to claim that a person utilising information technology becomes an entirely new cognitive subject, radically different from one relying only on speech, writing, print media or television. As we become increasingly involved in complex information technology systems, becoming dependent on them in more and more areas of our lives – possibly even addicted to them – we remain the agents of simple, natural cognitive actions within the factual (physical, natural, and social) worlds. It is not our senses and simple intellectual functions (inference, argumentation, etc.) that have been improved or altered by the use of computerised tools, but rather our memory, imagination and self-identification. The greatest impact of these tools can be observed in higher functions and mental processes, particularly in the concepts and speculations used by cognitive sciences and artificial intelligence studies. These fields of knowledge have created myths of an artificial human being (looking back to the legends of the golem), which reflect the understandable desire to not only construct fully functional ro-

bots, but also to uncover and conclusively understand the secret of human thought. As pointed out by many researchers studying the phenomenon (See Turkle 1996; Hetmański 2005), visions and theories of artificial intellect have led, in a broad cultural perspective, to a significant change in the human experience of one's own agency and subsequently in personal as well as self-cultural identity. They involve, for instance, identifying the mind with the Turing Machine, reducing cognition to algorithmic calculations and information processing. Eventually, this results (due to the impact of those concepts on common thought, particularly via computer games and multimedia education) in the specific self-identification of the users of computerised cognitive and communicational tools as cyborgs, avatars or zombies. I believe that this phenomenon is not only of interest to developmental psychology, pedagogy or mass communication studies, but also to epistemology, in particular the type herein referred to as technologised epistemology.

References

- Baird, Davis (2004). *Thing Knowledge. A Philosophy of Scientific Instruments*. Berkeley: University of California Press.
- Bolter, David (1985). *Turing's Man. Western Culture in the Computer Age*. The University of North Carolina Press.
- BonJour, Laurence (1992). *Internalism/externalism*, In *A Companion to Epistemology*, ed. by Jonathan Dancy and Ernest Sosa. Oxford: Oxford University Press, pp. 132–137.
- Dreyfus, Hubert L. (2000). "Telepistemology: Descartes's Last Stand". In *The Robot in the Garden. Telerobotics and Telepistemology in the Age of the Internet*, ed. by Ken Goldberg. Cambridge, Mass., London: The MIT Press, pp. 48–63.
- Fuller, Steven (2007). *The Knowledge Book. Key Concepts in Philosophy, Science and Culture*, Stocksfield, Acumen.
- Goldberg, Ken, ed. (2000). *The Robot in the Garden. Telerobotics and Telepistemology in the Age of the Internet*. Cambridge, Mass., London: The MIT Press.
- Goldman, Alvin (1995). "Internalism exposed", *The Journal of Philosophy* 96, pp. 271–293.
- Goldman, Alvin (1999). *Knowledge in a Social World*, Oxford: Clarendon Press.
- Goldman, Alvin (2000). "Telerobotic Knowledge: A Reliabilist Approach". In *The Robot in the Garden. Telerobotics and Telepistemology in the Age of the*