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THE EPISTEMOLOGY OF SMART TECHNOLOGIES: IS SMART EPISTEMOLOGY DERIVED FROM SMART EDUCATION?*

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The paper deals with the impact of smart technologies on cognitive and educational activities and assesses the role of smart education in education and cognition from semiotics and epistemology. The authors of the article consider smart-technologies as modern information technologies of various profiles, developed mainly for the performance of the semiotic and epistemological functions of the person with its maximum possible replacement in different areas of life.

The article notes that when evaluating smart technologies, some criteria are often overlooked, while the importance of others is exaggerated. In general, quantitative scenarios for the use of smart technologies prevail over qualitative ones. This situation leads to the fact that the main characteristics of smart technologies are replaced by secondary ones, causing overestimated expectations. For example, the authors examined the misconception that a student who studies a subject as part of online learning using smart technology begins to participate in an epistemological situation from a semiotic perspective. It is because online learning makes students “discover” knowledge independently, without the necessary methodology and teacher support. An overwhelming amount of research sees this situation as an achievement, and the authors consider it to be a negative factor. However, according to the assessment of the consequences of smart learning, the best results are shown by students who already possess some methodological knowledge. At the same time, the vast majority of students show a decline in their performance in online education.

The authors of the article note that from an epistemological point of view, such a property of smart technologies as a functional substitution of the subject is very consonant with some constructivist trends in epistemology and cognitive sciences, admitting “cognition without a subject.” These smart technologies’ parameters in education and epistemology allow some studies to voice ideas about the possibility of forming smart education and smart epistemology as non-subject ways of knowledge and cognition. The article demonstrated that this situation is permissible if one does not distinguish between the concepts of “information” and “knowledge” and the processes of cognition and informing. It is shown that if this condition is ignored, then the concepts of “knowledge” and “cognition” lose their meaning since the process of cognition is a way of relating knowledge and information, and it is impossible without a subject. The authors conclude that smart technologies should be considered an

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additional tool used for similar, but not heuristic, creative and primary actions prioritizing the subject in education and epistemology.

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The indication of a new type of technology as “smart” implies an understanding of how they differ from other technologies. This question is not solved within the framework of the technologies themselves but requires a philosophical and semiotic aspect. The active development of smart technologies in the form of the smart economy, smart management, smart education, smart city, smart home, smart society, and smart person contains a lot of positive things, but at the same time, there is much uncertainty in the way they function. It is especially true for what is commonly called smart education or smart technologies in education. Distance learning, with the help of Internet technologies, Massive Open Online Courses (MOOCs), has already become a common phenomenon, and many see them as the future of the educational system.

What do smart technologies change in education, and are they indeed qualitatively superior to traditional educational activities? In philosophical and semiotic terms, this question can only be answered if we touch upon the epistemological and semiotic aspects of the application and functioning of smart technologies in education and smart technologies in general. The epistemological-semiotic view of this issue allows us to better understand the changes made in education since the latter is an integral part of it. At the same time, to assess the cognitive potential of smart educational technologies, it seems that we should not start from a priori epistemological model but rather try to analyze the ways of organizing smart education to find out the features of the epistemological position that they suggest. The latter is important because modern epistemology is characterized by a pluralism of often mutually exclusive positions.

This approach is important for epistemology itself since its very significance is becoming more complicated given the development of cognitive sciences. The trend analysis in smart education and other smart technologies that change social reality allows us to update some traditional questions of the theory of knowledge within the framework of philosophy and scientific research. Regarding epistemology, I.T. Kasavin and V.N. Porus believe that “the question is not whether it has a future, but what it should be. Furthermore, there is a general answer to this question. The future of philosophical epistemology is associated with reforming its conceptual apparatus, methodological tools, and its issues. It applies to all system-forming concepts and methodological principles: it is necessary to introduce new semantic content into what is called ‘truth,’ ‘objectivity,’ ‘rationality,’ and ‘reality’” [1, p. 19]. Smart technologies may play an important role in the reform of the “semantic content” of epistemology.

The semiotic aspect of smart technologies in education is no less interesting. In order to evaluate the role and influence of smart technologies, we need to understand what criteria should be used to measure education itself, and based on this, see how these criteria change under the influence of smart technologies. Here we are faced with semiotic uncertainty when trying to make a comparison since, as I.V. Melik-Gaykazyan noted, there is no correspondence between education and its essence in measuring education methods. She writes that “against the background of an endless stream of numbers in which education is currently measured – in hours, in rates, in the volume of student populations, it can be considered irresponsible to say that the organizers and researchers of education, have just a ‘lock pick.’ It would be so if the listed indicators measured the essence of education and not what it *costs* its organizers and consumers. It is easy to understand that all these indicators are the expression of monetary units. This dimension is relevant in the social reality of the knowledge society. The only exception is one

nuance – the socio-cultural effect of education is immeasurable in money since the unconditional achievements of culture are always priceless, i.e., they are not determined by the cost of the resources expended” [2, p. 15–16].

Similar problems arise in evaluating smart technologies and their application in education when some parameters are declared as primary criteria, but other parameters replace them. This article is devoted to considering this aspect, its visualization in semiotic, epistemological, and other aspects.

The phenomenon of smart technologies has been sufficiently studied [3]. The prefix “smart” is added to the technology concept when it is implied that these are “smart” technologies, that is, technologies designed to replace a person as much as possible in the areas in which they are used. Semiotically, smart technologies are technologies that can, to a certain extent, perform the function of a subject. At least, such functionality is attributed to them by their creators. The question of the capacity limits of this idea and what it means to perform the function of the subject is still open. The main thing is that smart technologies, according to the assumption, can and should replace a person where it is possible to implement the following characteristics of the technological process: concreteness, measurability, reachability, relevance, and time constraints.

Smart technologies are actively used, and their use is declared a very convenient, comfortable, and effective form of organizing people’s lives. For example, a smart apartment can free a person from many everyday functions. However, this is an example from the sphere of everyday life. Nevertheless, can education be considered a sphere of everyday life, or to some extent similar to it? By everyday life, we mean routine duties, such as maintenance of an apartment, which fully correspond to the above characteristics of a suitable technological process. Suppose smart technologies are able to do something for a person. In that case, the idea of smart education, on the one hand, should assume the presence of specific processes and factors that exclude the direct participation of a person, and, on the other hand, the process of education itself can promote a person to change something in his/her ideas, abilities, skills, competencies, preferably in the direction of expanding, improving existing ones. Moreover, these transformations cannot take place without the direct participation of a person.

Extremely positive assessments prevail in the analysis of smart education, which shows the advantages of such an innovative construction of the education system for an individual and society. In particular, Raschupkina A. S., when describing the smart education system as the latest type of training, highlights adaptability and flexibility, self-orientation, motivation, accessibility, and high-tech security among its strengths [4, p. 380]. The emphasis here must be drawn primarily on individual or personal orientation, which is especially emphasized by E.S. Mironenko, who generalized and presented in her article the results of the definition of smart education by various researchers. The general summary of her research on the assessment of smart technologies in the education system is as follows: “the use of smart technologies in the educational process increases the efficiency of learning, leading to the individualization of educational routes” [5].

However, the most interesting point of these assessments is that, while declaring the positive sides of smart education and mainly focusing on its individual (personal) orientation, the researchers do not specify how this is achieved and how these aspects can be evaluated. It is assumed that the openness and accessibility of educational resources, the ability to form a sequence of individual approaches during training, the ability to discuss them in networks, on a forum, or on Skype produces the positive results mentioned above.

It turns out that semiotically, the student within the smart educational model is visualized as a kind of researcher, not in the context of science, but in educational activities. There is one significant difference: research activities in science are carried out, as a rule, by competent

professionals having some experience in such activities, who can determine the problem field in the system of available scientific knowledge, who possess the appropriate scientific methodology, whereas, in the education system (even smart education), the student is unlikely to have the above-listed abilities, although he/she is pushed to engage in research activities. Naturally, amateurs or novices who did not have the appropriate competencies achieved results in science, but this is still more an exception than a norm. In contrast, smart education in terms of the characteristics that describe it should reproduce research activities as the main ones for those who receive an education. Therefore, the assessment of smart education as a certain reference point (ideal) and the future of education does not seem unambiguous until the individual (personal) emphasis of training can be demonstrated not only technologically but also methodologically and meaningfully is clarified. Furthermore, here one cannot do without certain parallels with epistemological aspects.

In addition, both in educational and cognitive terms, the terms “knowledge” and “information” are sometimes used inaccurately or incorrectly when assessing smart education. Inaccuracy and incorrectness are manifested primarily in the fact that these concepts are considered interchangeable, even identical. It is also important to consider because smart education as a form of smart technology is based on information technology. Information technologies act as the technological and substantive foundation of smart technologies. Therefore, a lack of understanding of the differences between knowledge and information, or underestimating, can lead to complications of the person’s (subject’s) perception of how educational and cognitive research processes are interpreted. Partly, the disagreement with this kind of manifestation caused the writing of this article.

In other words, researchers highlight the positive characteristics of smart education, which today make the educational process personal oriented. In such education, a student is not just a recipient of knowledge but also a producer of knowledge (at least, the organization of the educational process is based on the rules of research), and the lack of methodological and content abilities is compensated by information technologies (electronic courses, the Internet, social networks, Skype and other information and communication resources and technologies). In fact, for the student, the educational situation is transformed into an epistemological one.

However, despite all the formal similarities of situations in the educational and cognitive processes when using smart technologies, we should not forget that the goals of the cognitive (scientific-cognitive) process and the educational process are not identical. In the case of scientific knowledge, the goal is to obtain new knowledge (new knowledge for the whole of humanity, such knowledge that has not yet existed). In the case of education, the goal is to master the existing knowledge. In addition, it is important to clarify that the development of existing knowledge is necessary not just to memorize it but to master certain social life practices that have already proven their effectiveness so as not to rediscover what was already done by the predecessors. Moreover, in this regard, the transformation of the educational situation into an epistemological one can be naive and dangerous, leading the students into a specific delusion, making them believe that their abilities can bring results that they are not ready to achieve.

Furthermore, the students are ready to receive the results, not so much technologically (in this matter, smart technologies give the students great opportunities to have quick access to any source of information for familiarization, clarification, and verification), as semantically and conceptually. It is because they do not have the maximum possible completeness in any of the subject areas of knowledge and, therefore, cannot organize the cognitive process in the right direction. Even in the case of an unexpected coincidence of these factors, a student will not be ready to assess the result’s significance. This situation can be compared (only in the opposite

direction) with the phenomenon of an untimely scientific discovery when a scientist comes to a certain result individually. Still, society is not ready to appreciate this result. For example, G. Mendel once formulated the laws of heredity, applying mathematical modeling of this evaluative phenomenon, but was not understood by his contemporaries. There are many similar cases in the history of science. In smart education, the situation is inverse. A student can receive knowledge already known to society. Still, there is a high probability of not understanding the meaning of this result or conviction of being the first who made it.

It turns out that smart education brings the student to the epistemological situation only psychologically, but all other aspects necessary for cognition are absent. In this case, students are invited to independently master the course they have chosen, implicitly assuming that there are no obstacles on this path. All students are put in a typical situation, regardless of how much they are ready to follow the proposed educational program. It leads to a discrepancy in the results between those who are ready psychologically and methodologically and those who are not ready. In the United States, it is no accident where the share of online courses in public universities reaches 35% of all taught disciplines. According to a study by American researchers S. Protopsaltis and S. Baum, there is a gap between students with strong and weak knowledge after the latter studied online. It is noted that “Students without strong academic backgrounds are less likely to persist in fully online courses than in courses that involve personal contact with faculty and other students and when they do persist, they have weaker outcomes. The lack of sufficient interaction between students and faculty is likely online education’s ‘Achilles’ heel” [6, p. 8].

At the same time, it would be wrong to ignore the possibilities of smart education and smart technologies in general, since each tool should be used for the purpose for which it was created and for the purposes and volumes in which it is most effectively used, without attributing extra expectations to it. Smart education, which includes online education and distance education, is an important, convenient, and effective tool if it is used not instead but as a supplement to the traditional education system. Creating an epistemological situation for the student, just as it happens in the smart education system, can be useful primarily in methodological terms. There is a connection between epistemology and education, and that a certain parallel can be drawn between these processes has never been a secret. The process of mastering existing knowledge is set by understanding how cognition works – the process of obtaining new scientific knowledge (among other things). The educational process is often organized as a heuristic cognitive process, when the teacher does not just convey knowledge to the students but does it in the same sequence in which the researcher came to it, giving the student a chance to be in the situation of the researcher and (before the teacher reports) to determine the result.

In this sense, it would be interesting to trace the relationship between the ratio of educational and cognitive processes in the context of the active use of smart technologies. Such parallels can be identified in any historical period of science, education, and philosophy development and demonstrate the knowledge and education correlation. Moreover, it can help to clarify this correlation in the smart technologies era. The key factor in implementing such a parallel is the person, who determines the cognitive and pedagogical factors during the person and the world interaction. This move can be the subject of a separate study and necessary for philosophical, scientific, and educational practices. The comparison of educational and epistemological models itself already requires substantial justification, given their diversity. However, in this article, we will limit ourselves to small analogies to, firstly, emphasize the existence of such dependence and, secondly, to understand the essence of the epistemological and pedagogical functions of smart technologies for society. This should help to avoid unnecessary illusions and apply them exclusively to what they should be used for.

The cognitive and educational process is built upon the person's abilities to the world cognition. If we turn to Plato to describe how the cognitive and academic process is constructed, then the indicated dependence is visible. In "Republic," Plato divides epistemology into knowledge (episteme) and opinion (doxa). True "being" is in knowledge, but it is not given to most people (only to the chosen ones and, as a rule, to philosophers). A person has only an opinion, but this is an unreliable way of understanding the world.

“– Then opinion and knowledge have to do with different kinds of matter corresponding to this difference of faculties?

– Yes, they are different.

– So, each of them has a distinct direction and features by its nature.

– Absolutely.

– Knowledge is a mental faculty/power that allows us to apprehend "being."

– Yes.

– For opinion is that with which we are able to form an opinion" [7, p. 258].

In cognition, little depends on a person since objective reality is not comprehended directly, but instead in its side manifestations (copies, reflections); therefore, the result of this cognition is an opinion. However, it is an unreliable source of ideas about the world. Hence, the educational model proposed by Plato is of a predetermined nature, since a person must only comprehend what is necessary and presented by more skilled persons, philosophers, since knowledge is available to them. It, by the way, is the reason why the latter can and should govern the state. Plato also builds an educational model according to the cognitive abilities of members of society. According to N. A. Butenko, "the education system is divided according to the inequality of society, which is based on three classes: philosophers who manage the state, guards who can be loyal to the state, and the great bulk (craftsmen and farmers) who are occupied with material interests, and are subject not so much to education as to mass ideological influence.

In the context of children's education, it is necessary to select the most pious parts from the myths, discarding lies and baseness, shocking music, focusing on the development of courage and restraint. There is an emphasis on disciplines that develop the mind in secondary and higher education, which goes back to theoretical thinking, which only allows us to understand the highest values: arithmetic, geometry, astronomy, music (harmony as the basis of mathematics), and dialectics (logic). However, dialectics (philosophy) is allowed to be studied only after reaching the age of 30, when the mind is focused on stability, maintaining the status quo, and obeying the teacher-philosopher, who broadcasts absolute truths drawn from the eternal world of ideas" [8, p. 51].

If we turn to the concept of J. Locke, here we will see a significantly changed model of the epistemological capabilities of the subject and, accordingly, a different model of education associated with these transformations. The concept of J. Locke is interesting because, in contrast to the majority of European thinkers of the New Time, he more clearly demonstrates the connection between the epistemological and pedagogical (educational) components. Unlike Plato, J. Locke assumes certain freedom in the actions of the subject in cognition and education. Experience is the source of human knowledge through which one's thoughts are formed and confirmed. The person himself initially possesses a kind of cognitive "purity" that requires a filling, which distinguishes this concept from the Platonic one, where the main cognitive action – remembering, testifies more to the original cognitive fullness, lost (forgotten) during the birth of a person.

In "An Essay Concerning Human Understanding," J. Locke compares a person to a blank sheet of paper that has to be filled out. "Let us then suppose the mind to be, as we say, white

paper, void of all characters, without any ideas:— How comes it to be furnished? Whence comes it by that vast store which the busy and boundless fancy of man has painted on it with an almost endless variety? Whence has it all the materials of reason and knowledge? To this, I answer, in one word, from EXPERIENCE. In that all our knowledge is founded; and from that it ultimately derives itself. Our observation employed either, about external sensible objects, or about the internal operations of our minds perceived and reflected on by ourselves, is that which supplies our understandings with all the materials of thinking. These two are the fountains of knowledge, from whence all the ideas we have, or can naturally have, do spring.” [9, p. 154].

The concept of the initial cognitive purity of the subject, for which Locke applied the term “*tabula rasa*” (blank slate), formed the basis not just for a pedagogical concept but received a broader interpretation as a model of human socialization. This concept was understood as optimistic since the education content could transform a person according to the needs of society. However, J. Locke himself believed that everything is much more complicated. According to T.B. Kadobny, “perhaps, a very unambiguous attitude to the point just mentioned led the educational philosophy to the assertion of almost one hundred percent predetermination of human knowledge, skills, and abilities by external – social, historical, economic – circumstances. It is how the message of the Enlightenment age appeared that it is possible to change the mind and morality of a person for the better by changing the society in which he lives. J. Locke, on the contrary, proves in his pedagogical works that there are no children with the same abilities and identical perceptions of the material they acquire in the process of education and training. Each consciousness forms the perception of reality through a unique scale of interactions with the environment” [10, p. 76].

J. Locke, on the one hand, admitted the presence of the necessary amount of knowledge, which has already been tested and requires its assimilation by students, naturally, taking into account the individual characteristics of perception. On the other hand, the possibility of free knowledge and education was allowed through the acquisition of new experience, provided the ability to reasonably assimilate this experience. D. Defoe showed this model of education and cognition by the example of his literary hero Robinson Crusoe. The hero of D. Defoe experiences a “*tabula rasa*” situation, once on a desert island and finding himself in entirely new conditions. However, thanks to the intelligence and proper organization of the experience gained, he quite successfully survives on the island, thereby demonstrating the effectiveness of the cognitive and educational model proposed by J. Locke.

The Plato and Locke models of the person’s cognitive perception, presented above, are in some sense antipodes (subject-nonoriented and subject-oriented) and are given to demonstrate by contrast how the essence and direction of the educational process depend on the differences in understanding the essence and direction of the cognitive process and the role of the subject in it. In one case, the cognitive process is understood as predetermined (subject-nonoriented). It depends on the cognitive abilities given to a person from above, by nature, which serves as the basis for a clear differentiation of the educational process and its linking to society’s cognitive and social characteristics. As in Plato, rulers (aka philosophers) take this post due to having the most advanced cognitive abilities and can directly comprehend existence, while other members of society have a lower social status (guards, farmers, craftsmen). They also differ among themselves in a specific cognitive-social hierarchy.

In another case, the cognitive process is understood as open, which also depends on the characteristics of cognitive perception (subject-oriented). However, these features no longer serve as the basis for building an appropriate social structure since the cognitive experience of each member of society is considered unique and varies from person to person. So in education,

without rejecting class differentiation, J. Locke nevertheless clarifies that the cognitive process depends not only on a person's cognitive abilities but also on experience. He emphasizes the unique nature of the cognitive experience of each person, which, accordingly, should be taken into account when organizing the educational process: "Each man's mind has some peculiarity, as well as his face, that distinguishes him from all others; and there are possibly scarce two children, who can be conducted by exactly the same method" [11, p. 608].

Let's turn to the concepts of the subject within the framework of modern epistemology. Firstly, it is complicated to identify unity in these approaches, and, secondly, the very concept of "the person" is being questioned – we are talking about the "death of the person," and such an interpretation is inherent in areas that are entirely different in their subject orientation. In all fairness, it should be clarified that the above examples (Plato and Locke) are, in some sense, a consequence of the author's reductionism used for clarity. Therefore, the question of the person has always been difficult with a wide range of approaches.

In today's epistemological literature, the concept of "the person's death" or the concept of denying its autonomy is a consequence of overcoming the representationalistic understanding of the essence of cognitive activity, based on the idea of mental reproduction of the external world. In postmodern literature, this was caused by "dissolution" of the subject in the text and in writing structures (M. Foucault, R. Barthes), by the dependence of human intellectual activity on language practices, and, at the same time, by a peculiar rejection of Descartes' anthropocentrism and Kant's transcendentalism. All this was laid over on certain phenomenological and existential accents emphasizing the character of individuality in the worldview and the resulting radical denial of the possibility of a universal comprehension of the world. As J. Baudrillard writes, "The 'person' as an absolute value, with its indestructible features and specific force, forged by the whole of the Western tradition as the organizing myth of the subject – the person with its passions, its will, its character (or banality) – is absent, dead, swept out of our functional universe" [12, p. 82].

In constructivist concepts, the idea of the "subject's death" is understood initially as a consequence of the non-acceptance that the world can independently exist from it; therefore, the mere knowledge of the world, formed by a person or another agent (actor), can be abstractly expressed and function without affecting the latter in any way. From the constructivists' standpoint, the very concept of the person testifies to its confrontation with the world and is the main reason for its appearance. Constructivists believe that a person is a part of the world, inseparable from it. Therefore, it possesses a more significant number of abilities and functions than subjectivity, which loses its relevance. As E.N. Knyazeva writes, when characterizing one of the constructivist trends in epistemology (enactivism), "the concept of enactive cognition, or enactivism, is becoming more and more influential in modern cognitive science, philosophy of consciousness and epistemology. It is influential because it develops in line with the current widespread constructivist orientations in epistemology, psychology, social philosophy, management theory, and Future Studies. Within this concepts' framework, the cognition subject, or a cognitive agent, be it a person or an animal, is considered as active and interactive: it is actively embedded in the environment, its cognitive activity is performed through its "actions" or "inactions" in the environment. Cognition, perception, thinking, and imagination are associated with an action.

In this concept, a holistic picture of cognitive processes is constructed, in which the brain as a part of the body; the body itself as an instrument of cognition, searching and cognizing the material mind and the environment it cognizes; cognitive effort as an active action are considered in a mutually conditioning, synergistic bundle" [13, p. 4].

Since the representatives of constructivist trends in the classical epistemology see the person only as one of the principles, without which a society can efficiently function and develop, research interest in the person disappears. It even goes so far that consciousness (which is the basis of subjectivity) is considered a specific function, which can be found in human beings and transferred to some other medium. It seems fantastic, but modern researchers, including philosophers, are actively discussing this topic and believe that the solution to this problem is a matter of time [14].

In particular, A.V. Katunin, who is far from the only supporter of the indicated points and writes on subjectivity in the journal “Voprosy Filosofii” (2016), is deeply convinced that such transfer is possible. According to him, “If we are talking about transferring of consciousness to an artificial medium, of course, this topic is closely related to the long-standing question in the field of artificial intelligence: is a machine capable of thinking and how can it be realized technologically? There are many thought experiments in this field: the Chinese Room Argument, the Turing test, the hypotheses of strong and weak versions of artificial intelligence, but there is also a thought experiment of the philosopher and psychologist Zenon Pylyshyn. We take the human brain and replace each neuron with an identical microchip with the corresponding functions, properties until we replace all the neurons. At the end of this experiment, the brain becomes artificial, but it retains the consciousness of the same person. Furthermore, most likely, if we develop enough so that we can make this kind of thought experiment real, the subject himself is unlikely to notice this replacement” [14]. Moreover, he is amongst many Russian and foreign researchers who admit such a possibility. This suggestion alone, which characterizes the epistemological nuances of cognitive activity, allows us to understand and explain a lot about how it can affect the educational process. There is a direct correlation with the understanding of the educational process manifested in smart education. Moreover, the very idea of technological development, with smart technologies as its quintessence, also absolutely correlates with understanding the place and role of the subject in cognition. Suppose smart technologies are designed to replace a person wherever possible. In that case, the declining interest in the person in many epistemological directions is, in fact, a certain embodiment of the replacement of a person in the field of cognition.

Indeed, the person can be reduced, according to the supporters of such a position, to a certain set of data, information that can be “downloaded,” “sent,” “transferred,” “multiplied”. For this reason, its role in cognition becomes unclear. However, this kind of transformation, in principle, should radically lead to the breaking of literally all the parameters of existence, which at the moment still do not seem unambiguous. Nevertheless, researchers adhering to constructivist positions believe such changes to be quite possible. It is especially evident from the following quotation by D.I. Dubrovsky. “If a new bearer of your consciousness is the same in its properties, dimensions, and ability to change its position in space, like your brain, then you, saving your *identity*, will be simultaneously in two places. This is not critical either for the *identity* or for the functions of consciousness and even can be seen as an advantage, since it is possible to switch the positions by attention shifting. However, suppose the new carrier of consciousness becomes a certain wave formation. In that case, you can become almost omnipresent, and you do not want to return to your former limited earthly consciousness (although, who knows, you may want to take a little break from the burden of cosmic consciousness and cognition, from the existential meanings and activities that come along). Of course, it is hypothetical reasoning. However, it can, to some extent, show that it is impossible to measure the future with the standards of our present consciousness. The transfer of consciousness, if implemented, will be associated with new value-semantic and activity-willing attitudes of consciousness will open the era of new existential meanings of existence and activity” [14].

Suppose we assume that the situation described in the quote is possible. In that case, knowledge in its traditional sense will cease to exist, or we will enter the period of existence that is called smart epistemology in the title of this paper. This period will be based on smart technologies that will carry out information exchange processes, knowledge acquisition without the subject's participation. Moreover, the person himself can become the object of such an exchange and be "downloaded" from one medium to another, simultaneously function as two or more Identities, and so on. It is no accident that today such characteristics of the person as "integral person," "network person," "contextual person," "distributed person," "synergistic interaction of the person," "cognitive agent," "embodied mind," "qualia," are being updated, reflecting the fact that the cognitive characteristic of the latter ceases to be the key one.

These characteristics also semiotically blur the borders between cognition and education as a process of acquiring new and assimilating existing knowledge since these processes are simply reduced to certain information exchange. The lack of necessary information is solved by using appropriate smart technologies to search for information and transfer it to a carrier. Of course, in some philosophical concepts of education (pragmatism, existentialism, postmodernism), the transfer and assimilation of knowledge are not the educational process's main goal. Since the person's personality itself, its formation is a key guideline of the pedagogical process. However, knowledge acts as an instrument of educational training, and the process of personality maturation depends on the way of mastering and presenting knowledge. [15, p. 26–30]. Furthermore, suppose the personal aspect loses its cognitive significance (and this how the subjectivity of cognition is expressed). In that case, it turns out that smart education should lead to smart epistemology and vice versa.

Such a radical revision of the usual phenomena and processes concerning cognition (scientific cognition) causes objections from specific philosophical approaches and a number of philosophers or clarifications related to some essential questions about the figure of the subject and its cognitive functions. There is even a trend of research, the general theme of which is "the return of the person." Of course, supporters of this idea do not deny the role of technologies (especially smart technologies) in the development of society and humans, their influence on the development of science and cognition in general. Such radical assessments indicated above are the projections of human thought into the perspective of the technological future of society. At the same time, these authors believe that the substitution of the subject in cognition, its replacement, or elimination by technology is not quite an accurate understanding of what is happening and is not quite the assessment that can be viewed as definitive. In particular, V.A. Lectorsky proposed several counterarguments against the idea of "the death of the person": in situations of risk and uncertainty, the role of the individual will only increase (technological development constantly sets society situations to risk and uncertainty); the multi-layered human Self requires a certain reflective principle, which allows restoring the loss of social identity of any of the Self-manifestations of the individual in the conditions of network diversity; without the Self as a subjective principle, cynical and ironic behavior in critical situations is impossible [16, p. 235–237].

The authors believe that they can also make a specific argument on their part about this. It seems that one of the main reasons associated with the person's role in cognition revision in terms of losing its cognitive monopoly lies in the field of differences in the essence of such processes as cognition and informatization. Unfortunately, very often, these differences are not taken into account. If we are talking about everyday communication, even scientific communication, but not in cognitive sciences or epistemology, then basically, such freedom of application is not of fundamental importance. The authors themselves sometimes also allow such liberties in ordinary

conversation. However, if we are talking about cognitive sciences and epistemology, it is vital to observe certain implementation boundaries of such concepts as informatization and cognition. The importance of distinguishing between the concepts of “knowledge” and “information” has already been mentioned above, but it has not been specified why. It is now necessary to explain these points more precisely to clarify the authors’ position regarding the epistemology of smart technologies, smart education, and smart epistemology.

The divergence in informatization and cognition should be sought in the difference between information and knowledge as phenomena. It was investigated in more detail earlier [17, p. 25–38]. The main thing now is to demonstrate the basic essence of the differentiation of their nature. The authors understand information as a certain existential dimension that underlies the world order. It is a collection of various data that can be transmitted, changed, and stored. The world has an information shell that is inherent in it initially. To emphasize the peculiar nature of information, we need to turn to the concept of the universe. Of course, the ancient philosophers did not use the concept of information. Still, this concept correlates with how they characterize one of the components of the world, which, moreover, is considered by them to be genuine and existing in contrast to the second component. Plato distinguishes between metaphysical (the world of ideas, *eidos*) and physical realities (the world of things). The metaphysical dimension of the world – the world of ideas is a real non-material world (ideal), inaccessible to the person’s direct perception. Ideas (*eidos*) are of divine origin, independent of a man, even though the possibility of their mental comprehension is not excluded. As Plato writes, “an idea is not born and does not perish, does not perceive anything in itself from anywhere, and does not enter into anything itself, invisible and not felt in any other way, but put into the care of thought” [18, p. 155].

The world of Plato’s ideas is, in fact, a certain ontological dimension of the world that is similar to information. The possibility of comprehending an idea by thought (mind) does not mean transforming its nature in the direction of the subjective principle. The latter is given exclusively physical reality (the world of things). Like an idea (the world of ideas), information also functions as an independent and self-sufficient reality, regardless of whether a person perceives it or not. Knowledge is a phenomenon of a different plane, connected with subjective nature, and is formed by the subject in its perception of the world. Using analogies to separate the concepts of “information” and “knowledge,” based on Plato’s works, one should be careful, since knowledge in Plato and the framework of the author’s concept is somewhat different since in the latter, knowledge (*episteme*) is not a product of subjective origin. Instead, it is a product of the mind, but it is more connected with the cosmic (existential) principle than the subjective one. Therefore, in Plato’s work, we are primarily interested in the phenomenon of the idea, the world of the idea as an analog of the phenomenon of information.

The subjective nature of knowledge presumes that its genesis is associated with a person, including the individual consciousness and the specifics of individual perception of the world. The world of knowledge is an exclusively subjective world related to the life of a person (society) and his/her abilities to exist and learn. If knowledge is not associated with the person, then it ceases to be knowledge. In this sense, such aspect of K. Popper’s work as the “third world” (the world of objective knowledge) is not entirely clear since this aspect in the framework of the article could be called “subjective information.” However, it is difficult to say how it can function. At the same time, the difference between the nature of information and knowledge does not mean that they do not correlate in any way with each other. Their relationship is called the cognitive process. Especially, suppose we apply a particular replacement of the “world” concept with the concept of “information” (which is one of the world’s dimensions). In that case, the actual

cognitive actions become more evident to correlate knowledge and information (as one of the states of reality). Another thing is that this correlation does not occur automatically but involves the subjectification of information, i.e., its transformation into knowledge. We get a paradox of some sort that information can be available to a person only when it becomes knowledge, but by itself (in its non-knowledge form), it cannot be accessible.

This paradox often leads to the fact that when there is an increase in information (and this process for us today is permanent) we tend to compensate for the inability of the human consciousness to master it by attracting appropriate technologies (the generalized name of which is smart technologies). At the same time, the fact that in cognition, it is possible to replace a person (subject) with the help of these technologies is also relevant; hence the idea arises that a person's knowledge can also be transformed back into information, and his consciousness can be reduced to some information carrier. Even referring to the publications by researchers who believe that it is possible to "copy" or "transfer" consciousness to some medium shows that in their description, it is possible when they start to avoid the concepts of cognition and consciousness, replacing them with concepts related to information.

In particular, let us refer to an excerpt from D.I. Dubrovsky at a round table on the topic of subjectivity concerning the challenges of cognitive science and information-cognitive technologies: "The ego-system of the brain constitutes our *identity*. It is a conscious-unconscious outline of information processes; it is multidimensional, organized in the brain vertically and horizontally, starting from the cortical and up to the stem structures. It consists of genetic and biographical levels (which store in memory the historical stages of our life, underlying our identity). It is a self-organizing system, in which global and local self-regulation processes of our *Self* are constantly carried out" [14]. As seen from the text, consciousness is placed on the same level as the unconscious but considered an information process outline. It is impossible within the framework of the conceptual apparatus of the article since conscious and informational processes are incompatible processes.

I.V. Melik-Gaikazyan presented an interesting way of distinguishing information and knowledge. The researcher, on the contrary, did it in the context of studying the information and its characteristics. According to this approach, information and its nature can only be fully understood if three characteristics are considered: the amount of information, its value, and its effectiveness. I.V. Melik-Gaikazyan believes that such specification of characteristics is essential for the following reason: "The emphasis is placed in connection with the widespread belief that 1) to understand the phenomenon of information, we need just one characteristic – the amount of information determined by the formula of K. Shannon; 2) it is permissible to identify the amount of information with entropy. We fundamentally disagree with these statements" [19, p. 179]. Moreover, this disagreement is because the amount of information is not its main characteristic, since there are more significant characteristics of the latter for a person: value and efficiency. In this, the authors see a certain semiotic similarity of the distinction between knowledge and information since the subjective (human) factor for evaluating information plays the most significant role and not possible to imagine without the transformation of the latter into knowledge.

If we separate the concepts of "knowledge" and "information" according to the principle described by the authors above, then the human consciousness (as the source of knowledge and the basis of its subjectivity) retains its autonomy and cannot be transferred anywhere (to any carrier), since such an action will lead to its loss or non-equivalent substitution. Moreover, these positions should be separated if we talk about knowledge and education and the relationship of these systems in their organization and functioning.

In this sense, smart epistemology cannot exist since its semantic origin implies replacing the subject in the maximum possible way and ideally in the absolute one. Some research in the field of cognitive sciences probably demonstrates that the brain and neural processes determine our consciousness and subjectivity, and we live in the illusion that we have autonomy, independence, and freedom. However, here we find ourselves in the space of assumptions, non-obvious explanations, and therefore we are free to make a decision based on our preferences. Furthermore, preferences are such that without subjective participation, cognition itself ceases to be such, so it is possible to characterize human subjectivity and consciousness differently, but it must be present in these processes. According to the authors of the article, the loss of subjectivity leads to the “death” of knowledge.

It is especially clearly demonstrated through the author’s understanding of smart education. Smart education leads to a change in education’s spatial and temporal characteristics. In this case, education is shifted to a virtual environment from the classroom and eliminates the time factor (schedule of lectures, seminars). The student can access the educational resource from anywhere where there is access to the Internet. The very contact with the teacher becomes indirect, only through electronic sources and information technology mediators.

What can be considered as the positives of this way of education organization? First of all, the preparation becomes fast. The student is not limited to a place, time, or schedule. Secondly, the student can independently determine the pace of educational training by having a powerful information resource to fill in the emerging problems in knowledge (although the student can not always adequately access his/her progress). These are the obvious advantages of smart education, but, perhaps, all the positive points are limited to this.

What are the negative aspects of smart education? First of all, decrease in direct contact between the teacher and the student and subjective interaction loss. It includes an emotional component, feedback, and the possibility of prompt management of the educational process. Secondly, it is the loss or reduction of the educational aspect factor, since, with the acquisition of new knowledge, the teacher transmits certain values, behaviors that are easier to perceive when associated with acquired knowledge. The knowledge obtained in traditional education is associated with the individual personality of the teacher, which significantly contributes to the educational process. Thirdly, the loss of the methodological aspect. Knowledge is mastered easier when it is obvious how this knowledge was obtained when the reasons and mechanisms for obtaining it are explained. In smart education, this aspect, as shown above, is transferred to the student, but to master such qualifications independently, the student must have significant methodological training, which is very rarely a case. Fourthly, the loss or reduction of the education’s creative component, when the teacher or student in the course of the lesson may wander away from the specified content, or in the process of communication come to some discoveries, which is almost impossible to do in the framework of electronic course materials. Fifthly, an exclusively technical aspect – no charging or power failure, or no Internet access. Even if this is rare, it makes smart education impracticable, so this fact can not be excluded.

In other words, according to the authors of the article, the ratio of positive and negative aspects of smart education demonstrates that the critical factor of the educational process in semiotic terms, its subjective component, and its minimization will not affect the quality of education in the best way. Therefore, smart education (smart technologies in education) makes sense to use to the extent that they do not interfere with the most fruitful manifestation of the individuality of teachers and students in this process. It means that smart education should not be considered an alternative to traditional education, but only as an auxiliary means allowing you to compensate for many routine traditional education processes (for example, selecting literature,

familiarity with the course plan, and access to sources). The same can be said about the epistemology of smart technologies. To the extent that smart technologies facilitate the life of a cognitive subject in performing cognitive activities, their use becomes necessary and practical. However, suppose there are tendencies of partial or complete replacement of the subjective principle in cognition. In that case, their implementation seems excessive and even dangerous since we are talking about eliminating cognition and epistemology (as the study of human knowledge) as a phenomenon.

Thus, considering the epistemology of smart technologies and understanding such concepts as smart education and smart epistemology allows us to draw the following conclusions. It would be too early to talk about the real benefits or harms of smart technologies in education. Hence there are incredibly optimistic scenarios and pictures of the smart technologies' dominance in education systems and epistemology. Up to the total replacement of education and cognition in their relatively traditional form to support "triumph" of smart education and smart epistemology, which should be defined as education and cognition without the person (without the person's participation). Supporters of this constructivist approach admit the possibility of reducing the subject to certain information and transferring this information to different media. The authors believe that such scenarios result from a loose separation of the concepts of "knowledge" and "information," the processes of cognition and informatization. The critical aspect explaining the separation of these concepts and processes is the figure of the subject, through which cognition becomes possible as a conscious activity. In this case, smart technologies act exclusively as auxiliary means making it easier to perform educational and cognitive routine functions, while creative, heuristic, individual-personal manifestations of the indicated processes are given to an autonomous person with the ability to act freely. Such a point allows epistemology to remain relevant today and not be replaced by various cognitive sciences.

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