# COMPUTATIONAL EDUCATION IN THE PERSPECTIVE OF PERSONALISTIC PHILOSOPHY OF EDUCATION: PROBLEMS AND INTERPRETATIONS

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**Abstract:** *The subject of this article is broadly defined computational thinking, interpreted in the context of its use (benefits and limitations) in the educational process. The presented text analyzes not only the phenomenon of computational thinking, but also the education based on it – "computational education". The analyses presented are not holistic and exhaustive, but rather aspectual, theoretical and introductory. Referring to the theoretical perspective of personalistic philosophy pedagogy, the author presents analyses indicating both the cognitive effects of this type of education and (above all) its educational (formative) effects. Taking as a starting point the classical humanistic model of Greek paideia, developed in the Latin model of humanitas, the author of the study attempts to indicate to what extent computational education can serve the integral development of the person.*

**Keywords:** *comptuational education, camputational thinking, personalism, integral education, the person.*

## Introduction

The article explores computational thinking in its broadest sense, interpreted in the context of its use (benefits and limitations) in the educational process. The text presents analyses not so much of the phenomenon of computational thinking, understood as a peculiar attribute of human beings, but of education based on it – computational education and selected aspects of the context of its functioning.

The analyses presented are not comprehensive or exhaustive. They are aspectual and introductory. Referring to the theoretical perspective of personalistic pedagogy, descriptive, explanatory and evaluative remarks (statements) have been formulated concerning this type of education, especially its educational (formative) aspects. Taking as a starting point the classical humanistic model of Greek *paideia*, developed in the Latin model of *humanitas* (Jaeger, 1959; Chłodna-Błach, 2020), the author of the study

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seeks to identify to what extent computational education can serve or threaten the integral development of a person.

Justifying the choice of the undertaken research, it should be pointed out that education and the accompanying scientific reflection (pedagogy) from its very outset remained in close relation to the transformations that society and culture have undergone. For centuries, it has been a response to the most important individual and social needs. It has responded to the challenges and threats faced by individuals and communities.

Even today, education and pedagogy are not and cannot be indifferent to the civilisational changes taking place. An important element is the dynamic development of information technology, which, combined with the spectacular achievements of technology based on it, is not only awe-inspiring but also irreversibly transforms the human habitat. Revolutionary technological developments go beyond the scope of the sciences. They are generating significant transformations in the humanities. They affect the way individuals, groups and entire societies function. Their pace, scope and content lead to the conclusion that the transformations taking place before our eyes concern not only the biological, psychological, social or cultural spheres but ultimately relate to the nature of man (Fukuyama, 2003; Kaku 1997).

In describing and explaining current social and cultural processes, pedagogy goes beyond cognitive tasks. It seeks predictions and formulates postulates for steps to be taken in order to support individuals in their creative presence in the world and in their individual development. The social phenomena described and explained require in this respect a normative, evaluative reference, which is generated based on pedagogical theories.

The theoretical background of the analyses presented in the text is provided by personalistic pedagogy. The adoption of this concept as an interpretative and normative foundation is justified by its distinctive cognitive output and the embedding of personalism in the centuries-old intellectual tradition of the Euro-Atlantic civilisation: reliance on the classical philosophical tradition of Greece and Rome and the moral message of Judaism and Christianity. It is particularly concerned with the use of the key personalist categories of: 'person', 'personal dignity', 'subjectivity' and 'integral development' (Kiereś, 2015).

The article comments on the following questions, which at the same time structure the content of the article:

1. What constitutes the essence of education based on computational thinking?
2. What is personalism and what is personalism in pedagogy?
3. To what effects does (can) computational education lead?
4. What criteria can be adopted in the process of evaluating the effects of this type of education?
5. How to relate the effects of computational education to the key category of personalistic pedagogy – the dignity of the person?

In line with the adopted aims and research questions, the article is divided into three parts. Part one provides the defining characteristics of computational education. Part two contains a characterisation of the essence of personalism and its application to pedagogy. The third part formulates interpretative and evaluative remarks on the functions and effects of computational education considered from the perspective of personalistic pedagogy.

The presented research findings are the result of analyses of source literature. They are based on the method of semantic text analysis, which is an element of the research strategies of hermeneutics and analytical philosophy. The text is therefore theoretical and analytical in nature. It does not constitute a report on the author's empirical research, but is a collection of generalising and normative observations developed on the foundations of existing research on the subject matter at hand. Despite the references to the achievements of world literature, the Author took special account of the scientific achievements of Polish pedagogy. In this way, he presented pedagogical achievements that are little known in the world. Its specificity is based on the constant development of the personalistic concept in education. It is also characterized by openness to research on the latest civilizational changes.

As sources for preparing the text, studies available in the world literature on computational thinking and computational education were used, carried out by authors such as: Seymour Papert, Jeannette Wing, Stamatios Papadakis, Michail Kalogiannakis, Nicholas Zaranis. In terms of personalism, the source works of Emmanuel Mounier and Jacques Maritain were used, as well as the work of their continuators in pedagogy, such as: Marian Nowak, Imelda Chłodna-Błach, Barbara Kiereś, Marek Jeziorański, Andrzej Łuczyński.

**The concept of computational education**

The names 'computational education' and 'computational thinking' are widely used in English-language scientific literature. Despite this, one may venture to say that they are new names, only recently widely present in scientific terminology. The commonness of their use, despite the not-so-distant time of their generation as far as humanistic phenomena are concerned, undoubtedly testifies to the high dynamics of the development of computational education and the great interest of researchers and educators in this phenomenon.

It is assumed that the English term '*computational thinking*' was coined in 1980 by the South African mathematician, co-creator of the LOGO programming language Seymour Papert (1928–2016) and then used by the same author in 1996 to describe a model of mathematics education (Papert, 1980; Barbe & Proulx, 2017; Skibińska and Zacniewska, 2021). In contrast, Jeannette Wing, a Microsoft board member who in 2006 used the name in the title of an article published in the journal *Communications of the ACM*, is considered a particularly important populariser of both the name itself and the practice it denotes (Wing, 2006). It is J. Wing's texts that are cited in the literature as key sources for defining *computational thinking*, Wing states:

> "Computational thinking is a fundamental skill for everyone, not just for computer scientists. To reading, writing, and arithmetic, we should add computational thinking to every child's analytical ability. […] Computational thinking involves solving problems, designing systems, and understanding human behavior, by drawing on the concepts fundamental to computer science. Computational thinking includes a range of mental tools that reflect the breadth of the field of computer science" (Wing, 2006, p. 33).

National languages other than English, despite having their own specific terms relating to computational education and computational thinking (in Polish they are for example: '*edukacja informatyczna*' ('informatics education'), '*edukacja okołoprogramowa, edukacja obliczeniowa*' ('program-related education, computational education'; French terms: *'pensée numerique'*, *'pensée informatique'*, *'raisonnement informatique' or 'pensée computationnelle'*; German: *'rechnerisches Denken')* commonly adapt the English names mentioned above. They are generated on the principle of 'calques', i.e. they are created by adapting the spelling and pronunciation of English names to the rules of the respective spoken and written national language. For example, this is the case within the Polish language, where the English names: '*Computational Thinking*' and '*Computational Education*',

correspond to the Polish terms '*myślenie komputacyje*', '*edukacja komputacyjna*'; in French, the expression: *'pensée computationnelle';* and with German, it's an expression.: *'Computerdenken'* (https://www.larousse.fr/dictionnaires/francais/num%C3%A9rique/55253: 31.05.2024; https://translate.glosbe.com: 31.05.2024).

Although the names analysed were introduced into scientific terminology at the end of the 20th century and popularised in the 21st century, the origins of computational education are much older. Various aspects of it appear at different periods in history in the views of many authors of pedagogical systems, and earlier also in philosophical concepts. Antiquity can be considered the cradle of computational education defined as education based on the principles of logic and algorithmic thinking. The ability to think discursively and to hold discussions (eristic) based on analytical thinking was already promoted by the ancient creators of philosophical knowledge of human education (*paidea*), i.e. Socrates and Sophists. The requirement for Plato's students at his academy to know mathematics or Aristotle's demand for philosophy to be based on logic can also be regarded as elements genetically linked to computational education.

In the history of philosophy, some elements contemporarily attributed to computational thinking and computational education appeared in rationalist philosophical systems. These are especially syllogistic thinking, eristic, critical thinking and also the reliance of the scientific research process on algorithmic and mathematical description of research results. These were clearly evident in Thomism, positivism, scientism, analytic philosophy and, particularly, logical empiricism. Undoubtedly, they are also a constitutive element in the development of mathematical natural science.

In the Polish philosophical tradition, elements converging with the postulates of computational education appeared in the circles of analytic philosophers and logicians, especially in the work of the representatives of the so-called Lvov-Warsaw School and its disciples. Particular contributions to education based on logical culture were made by the founder of the School, Kazimierz Twardowski, and his student, Kazimierz Ajdukiewicz (Ossowska 2013). Ajdukiewicz claimed that knowledge of logic is fundamental to any type of education. He considered "[...] the knowledge of logic [to be] an extremely important component of general education – both in its theoretical dimension and in its practical dimension (with a strong emphasis on the latter aspect). In fact, he considered logic to

be a necessary component of any effective form of education" (Ossowska 2013, p. 538).

In pedagogy, postulates that coincide with the claims of contemporary computational education include concepts that refer to the tradition of realistic concept of education. The origins of computational education, as a systematic educational practice based on algorithmic thinking for effective solutions of specific cognitive or practical problems, are seen in pragmatic education, initiated in the early 20th century by James Dewey (Skibińska & Zacniewska 2021).

In Poland, systemic educational practice based on algorithmic and mathematical thinking dates back to the early 1960s. It is related to the preparation of students for the use of IT devices and was initially addressed to secondary school students. It was only with the popularisation of microprocessors in the 1980s that the scope of computational education was extended to all stages of schooling. At that time, however, the focus was on teaching computer science, including programming. Changes in the content of computational education did not occur until the first half of the 2000s. Computer science education was then recognised as one of the elements of computational education, aiming to develop a specific algorithmic, but also creative, way of thinking and problem-solving (Sysło 2011; Kopczyński 2018).

Over time, computational education has developed and changed along with the advances in computing, technology and societal needs. As a result, it is difficult to speak of a homogeneous model of computational education today. It includes historically established practices, as well as new proposals for education inspired by the dynamic development of computer science and digital technology. However, collecting the elements common to various concepts or models of computational education, the following key subject areas can be indicated: algorithmic thinking, logical thinking, analytical thinking, critical thinking, computer literacy, mathematics education, teaching programming and education corresponding to the development of artificial intelligence (Skibińska &Zacniewska, 2021).

On the other hand, decomposition, abstraction, algorithm creation and testing can be identified as typical elements (aspects) of the computational thinking process. Decomposition consists in breaking down complex problems into simple, familiar ones, subject to intellectual mastery; abstraction is the ability to distinguish between elements relevant to the solution of a problem and irrelevant ones; algorithmicity consists in the

ability to generate rules for step-by-step problem-solving; while testing is the ability to realistically carry out the verification procedure of an algorithm (Skibińska & Zacniewska 2021, p. 42).

As a result, the understanding of (the concept of) 'computational education' can be reduced to two types: narrow and broad. In the narrow view, it is education concerning a variety of computer and mathematical skills. It concerns the ability to operate computer devices, to be effectively present in digital reality as well as programming skills. In the broad sense, it is a type of education that goes beyond the IT sphere. In this sense, it is an education based on the principles of problematised, algorithmic, critical and pragmatic thinking. It precedes the realm of computer science and goes beyond it by treating algorithmic thinking as an effective tool for describing and changing reality.

**The Concept of Personalism and Personalistic Pedagogy**

Personalism is defined as a philosophical (anthropological) concept (group of concepts) that describes and explains the essence of the human being in relation to the category of person (Mounier, 1934). The lexicon of classical philosophy defines personalism as: "[…] (1) a doctrine that emphasizes the autonomous value of man as a person and demands its full affirmation; (2) programs of action that promote the development of the human person, subordinating economic and technical values to personal and spiritual values" (Żardecka, 1997, p. 422).

It is assumed that the name 'personalism' is a compound, derived from the Latin prefix '*persona*' – person and the suffix '*ism*' – meaning: concepts, currents, views, ideologies. Etymologically, the term '*persona*' and its earlier Greek equivalent '*prospon*' meant a theatrical mask. Over time, the term '*persona*' came to be used to designate actors, then prominent people, and finally as a synonym for 'human being' (Nowak, 2003).

As a philosophical category, the term '*persona*' was promoted within Christian theology and philosophy. The issue of 'person' was central to Christological and Trinitarian discussions. These culminated in the generation of a definition of person by Boethius (480–524) at the dawn of the sixth century, defined as '*individua substantia nature rationalis*' - an individual substance with a rational nature. Further development of philosophical and theological reflection (Augustine, Thomas Aquinas, Friedrich Schleiermacher) led to the identification of the essential, natural characteristics of a personal being, i.e. rationality and individuality, self-

consciousness, freedom, community, morality and religiousness. These characteristics give a person the inalienable value of personal dignity (Kiereś, 2015; Łuczyński, 2018).

Personalism was promoted primarily by Christian thinkers. Nevertheless, it was also developed as a concept independent of religion, including as a humanist and liberal trend. As a social movement, personalism took shape before the Second World War, mainly in France and Belgium. In France, it owes its emergence to a group of intellectuals gathered around the journal *L'Esprit*, of whom Emmanuel Mounier (1905-1950) and Jacques Maritain (1882-1973) were of key importance. Drawing on the achievements of existential philosophy and Thomistic philosophy, they formulated the concept of the '*Personalist Revolution*', which aimed to change human mentality and culture. It expressed the personalists' opposition to the anti-humanist culture of the societies of the time, their rejection of the ideologies of communism, fascism and liberalism, and their postulation of the need to build a culture based on an anti-ideological attitude of respect for the person, the individual and the community of persons (Deneken, 2012; Nowak, 2021).

In Belgium, personalism was developed primarily at the University of Leuven. Cardinal Désiré-Joseph Mercier (1851–1926) is considered its main founder, according to whom Thomistic philosophy sets the theoretical basis for anthropological analyses justifying the personal dignity of the human being. Focusing on ethical issues, Mercier generated a theory of moral conduct based on the concept of moral virtues, moral character and a properly formed will. According to its principles, moral decisions should appeal both to the truths of faith and to the content of rational insight (Degange, 1984; Kunowski, 1966).

The cultural impact of personalistic thought was particularly evident in the post-war years. It provided inspiration for such documents as the UN International Declaration of Human Rights and the documents of the Second Vatican Council. Towards the end of the 20th century, personalism found fertile ground for its development in the former communist bloc countries. In the post-war period, after more than fifty years of domination by Marxist ideology, it gained the status of an alternative and liberationist current. Promoting the ideas of freedom and respect for the dignity of the person, it gained the rank of a conceptual base for social movements fighting against communist indoctrination (Nowak, 2021; Jeziorański, 2024).

In spite of the differences in content that exist in the different varieties of personalism, it seems that theses and categories common to these varieties can be identified. The key assertions of personalism include:

1. The conviction about the personal nature of man;
2. Recognition of the inalienable, ontic dignity of every human being;
3. A belief in the equality of all human beings;
4. Recognition of rationality, freedom, self-consciousness, the possibility of self-determination, relationality (community), and the moral sense as essential elements of personal human nature;
5. Acceptance of the common good as the organising principle of social life.
6. Recognition of the integrity of human nature, i.e. its being composed of biological, psychological, social, cultural and spiritual (religious) spheres (Nowak, 2003; Kiereś, 2015. Łuczyński, 2018).

Both the personalism of J.D. Mercier and French personalism had a distinctly pro-educational character. The demands for the formation of individuals were genetically woven into the content of personalism. A change in the way of thinking about man and his value was to take place based on education and the promotion of an integral and humanistic culture.

Over the years, the development of personalistic reflection on education has proceeded in parallel with the development of personalism. It was taken up by such thinkers as J. Maritain, E. Mounier, Romano Guardini, Luigi Guissani, Janusz Tarnowski, Karol Wojtyła, Stefan Kunowski and Marian Nowak. Like personalism, pedagogical personalism is not homogeneous, despite referring to the pivotal conviction of the personal dignity of every human being. Depending on the theoretical background, there are neo-Thomistic and perennial, existentialist and liberal positions within its scope (Nowak, 2021; Kiereś, 2015).

Parallel to the main theses of personalism, pedagogical personalism proclaims:

1. "The need to respect the dignity and autonomy of all the subjects of the educational relationship": pupil and teacher, pupil and educator, child and adult.
2. Recognition of the pupil as the subject and primary factor of education.
3. The need to base education on the concept of integral humanism.
4. The promotion of active schools.

5. The identification of education with the so-called 'maieutics of the person', i.e. with the support of the natural development of the person by the educator, accompanying the pupil in the process of his/her autonomous growth.
6. The recognition of the autonomy of the pupil as the primary goal of education.
7. The priority of the natural, primary educational environment, especially the family, in education (Nowak, 2003).

**Computational Education in the Perspective of Personalistic Pedagogy**

Typical of pedagogical research is its simultaneous descriptive-explanatory and normative character. The analysis of computational education from the perspective of personalistic pedagogy allows one to formulate remarks referring to its methodological and theoretical aspects. Three aspects are addressed in this text: 1) the possibility and scope of assessing the effects of computational education; 2) the reference of computational education to the current needs of civilisation; 3) the relationship between the postulates of computational education and the personalistic postulates of the dignity of the person and the integrity of education.

1) The identification of the benefits and risks of computational education is not a straightforward matter. It is difficult insofar as it is largely based on predictions of its long-term impact. Moreover, it concerns a human being – a person – who is not a fully known and perhaps not even knowable entity. Man as an entity cannot be comprehensively and exhaustively described or explained, especially in the conceptual terms of the mathematical and natural sciences (Jeziorański, 2022).

It seems difficult at the moment to identify the developmental and social consequences of computational education, or at least a certain range of them. The main point is that the practice of computational education has not been stretched out long enough over time to speak with a high degree of certainty about some of its effects. When describing the results of this type of education, one can speak of cognitive and personal aspects, as well as of effects in the sphere of social and cultural life. While the cognitive results of computational education and the effects it produces in the field of knowledge and in the cognitive skills of those being educated can be subject to measurement, the educational and social consequences of computational education may be difficult to determine. For pedagogy,

understood as the humanistic science of the lifelong process of fostering human development, it is not only the ad hoc study of its results in (identifying knowledge resources or ways of reasoning) that is important, but also (above all) the holistic developmental impact, in relation to children, adolescents and adults. In pedagogical terms, therefore, ad hoc measurements as well as longitudinal studies are important, and the latter seem to be difficult to implement at present with regard to computational education.

Another aspect that makes it difficult to describe the pedagogical results of computational education is the lack of a single definitely established form of it. This concerns both its various models (determined by different models of computational thinking and different conceptions of education) and the differences caused by the different social and cultural conditions in which it is implemented. It seems naïve to think that it is possible to implement it in a single, unchanging and a priori determined form. Despite its seemingly universal mathematical and IT basis, the conditions of the social, cultural and even psychological and biological contexts of individuals make its universalisation impossible.

A no less significant problem hindering the evaluation of computational education in terms of its effects is the limited possibility of predicting the direction of further development of technology and computer science and thus social development. The current state of knowledge in this area shows that it is difficult to determine their further changes. Besides, not only their dynamics, but also the content of the changes are unpredictable. Perhaps the best example of this is the development of artificial intelligence, about which one can only speculate. The effects of artificial intelligence on human beings today are unimaginable, both (above all) in the cognitive aspect and in the psychological, social, moral and religious aspects (Fukuyama, 2003; Kaku, 1997).

Consequently, the fundamental question that remains is what criteria should be adopted in order to accurately and as precisely as possible determine the effects of computational education. Its creators and theorists themselves admit that it goes beyond mathematics and computer science, that it is a way of algorithmic and critical thinking and problem-solving. The expectations placed upon it are therefore not only about computer literacy, although important, they do not exhaust its essence.

As computational education concerns a human being, the evaluation of its results should relate not only to the subject content, but also, or perhaps

primarily, to the addressee of this type of education. However, also in this aspect, it is problematic to determine the specific features of an individual – the addressee of educational activities. An in-depth anthropological analysis makes it clear that there are various concepts explaining the nature of man, including natural-scientific, socio-cultural, personalistic, and humanistic concepts. Fundamental, therefore, is the question of "who" man – the addressee of computational education – is considered to be, what characteristics define him, what essential qualities are attributed to him. Is he a citizen, a member of the community; is he an individual, an entity striving to develop only his own psychic potentialities; or is he a person – *unitas multiplex* – at the same time an individual and a social being, an organism and a religious and spiritual being (Maritain 1969; Kiereś, 2015; Łuczyński, 2018).

2) Undoubtedly, computational education responds to the most significant changes and needs of modern man and the needs of societies. Computerisation, information technology, robotisation and artificial intelligence are an important, and perhaps the most important, element of contemporary civilisational change (Papadakis, Kalogianniakis & Zarianis, 2016; Papadakis, Kalogianniakis & Zarianis, 2018). Consequently, the need for education in this area is also undeniable. It is about preparing people (not only young people) to use the achievements of technology responsibly and wisely. There is no doubt about this. However, the problem is whether computational education is a sufficient type of education, whether it prepares one to function in the contemporary and future world and whether it is able to respond to the dynamic changes of civilisation and whether it meets the essential needs of man.

Genetically and theoretically speaking, computational education is based on the achievements of the mathematical and natural sciences. Its relevance here is not (as stated above) only in terms of a narrow, technical reference to mathematical problems or the efficient "navigating" of computer reality (Wing, 2006). It is in fact about a specific way of understanding reality and human nature. In this respect, computational education seems to be at risk of being subordinated to mathematical and natural-scientific thinking. Thinking which, as history shows, is reluctant to allow other, non-natural-scientific ways of interpreting the world and man. It monopolises not only the way science is done, but also (contrary to declarations) creates a specific set of worldview theses (McGrath, 2005).

The history of science, as well as contemporary pedagogical currents and concepts, however, show that mathematical and natural science knowledge does not exhaust the wealth of pedagogical output, let alone the output of science. The humanistic and personalistic, natural-scientific and liberal currents remain no less important theoretically as a field of research. They have formed and continue to form a conceptual counterbalance to the dominance of pragmatic education and the technicisation of education. They enrich natural-scientific knowledge, which seeks to describe and explain reality as precisely as possible in mathematical terms, with its humanistic understanding and interpretation (Jeziorański, 2022).

The presence of humanistic knowledge in computational education is valuable not only in terms of enrichment, multiplicity and diversity of views. It should also be noted that it has a specific cognitive, theoretical value. In the first place, it is about recognising the human being as an entity not fully knowable, as an entity constituting a mystery, an entity that cannot be reduced to biological processes, or to an element of nature. Contrary to the positivist belief in the unlimited cognitive and practical power of science, humanism introduces an understanding of reality (or at least human reality) as only partially cognisable empirically. In this aspect, such spheres (aspects) of human functioning as morality, spirituality, religiousness, creativity, dignity, freedom are not subject to mathematical and natural-scientific cognition. Their cognitive exploration is only possible through understanding and empathy (Jeziorański 2022; Jeziorański, 2021).

3) The distinctions made are important in the context of the distinction between education and upbringing, which is crucial for pedagogy (or at least for classical pedagogy, including personalistic pedagogy). While the name 'education' refers to the process of shaping human knowledge and cognitive skills, 'upbringing' refers to the process of shaping human attitudes, assisting in multi-faceted development. In particular, it refers to social, moral, spiritual and religious aspects. The category of education is typical of Anglo-Saxon and Francophone cultural circles, while the category of upbringing has become widespread alongside 'education', in the German-speaking area and in the pedagogical tradition of Slavic countries (Jeziorański, 2022).

When talking about computational education, the problem remains relating it to the categories of education and upbringing. It is necessary to decide whether its scope includes only the transmission of knowledge or also upbringing, formation. An important postulate in this context,

stemming from personalistic pedagogy is the correlation of computational education with elements of upbringing. The concern that in the process of training algorithmic thinking and acting, the need to support the development of the 'entire' person should not be forgotten. Preparing pupils not only to use computer tools efficiently, to have algorithmic and effective problem-solving skills, but also to acquire the ability to formulate moral judgements and moral behaviour, the ability to distinguish individual, psychological, cultural and moral threats from the benefits that computerised modernity brings, to prepare for its creative, non-algorithmic transformation.

The body of work of personalist pedagogy clearly points to the danger of excessive intellectualisation of education. Analysing the practice of education, personalists notice that it tends to focus on the cognitive sphere of man. According to the principle of integral upbringing, it does not constitute complete education of the person. Therefore, personalists postulate that education should be supplemented with emotional, moral, social and even physical education.

What is important for the realisation of the postulates of personalistic pedagogy in computational education is the cultural context in which it takes place. Modernity, with its dominant anti-fundamentalist, pluralist and mosaic thinking (Bronk, 1998), is not conducive to an education that is by definition based on the generation of possibly fixed judgements and norms. Therefore, the question of their sources remains important. According to the personalists, it is insufficient in this regard to refer to social or cultural sources. Their ultimate rationale is the reflection on human nature. Thanks to philosophical reflection on man, it is possible to identify fundamental characteristics of the person which, potentiated, given in embryonic form, need to be updated in the course of development and education.

**Conclusions**

Obviously, personalism cannot be treated as a universal pedagogical concept, explaining all educational phenomena, including detailed scopes of education. However, the cognitive value of this current lies in the fact that it captures educational phenomena in the aspect of their essence, at a general level, relating them to anthropological categories, especially the category of the dignity of the person. It is also in this context that computational education can be explored. Its analysis carried out in this

way does not provide detailed methodological, technical answers. However, it allows for a critical reflection on its essence. A reflection having not only theoretical significance, but also translating into educational practice.

The principle of integral upbringing, adopted within the framework of personalism, defines the necessity of implementing educational interventions in order to support the harmonious development of all spheres of the human structure. Educational interactions should stimulate the development of a human being as a person, i.e. their biological, mental, emotional, cognitive, social, spiritual and religious spheres. The omission of educational interactions in any of the spheres of the human being not only constitutes an aspectual deficiency. Such an omission disrupts education in its entirety.

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