

# Theoretical Foundations of Human Capital Education in Economic Growth and Development Management

## Teoretyczne podstawy kształcenia kapitału ludzkiego w zarządzaniu wzrostem gospodarczym i rozwojem

Franciszek Piontek\*, Barbara Piontek\*\*

\**WSB University in Dąbrowa Górnicza, Poland*

\**E-mail: f\_piontek@wp.pl*

\*\**E-mail: bempiontek@gmail.com*

---

### Abstract

In this paper we try to answer the following questions: How will the nature of science change? And How will the education of human capital change and what will it be like, as a result of changing the nature of science, in structural and functional terms and what consequences for the management of growth and development will it have? Change in the nature of science consists of negating the basic axiom, which is the principle of contradiction YES≠NO replacing it with paradigm of deregulation YES=NO=MAYBE. Modify in quality of the education of human capital, the restriction of general education; the limitation of competencies resulting from general education may have adverse effects in the demanding technology market and may eliminate advantages in the processes of automation and robotization. The most important conclusions from the discussion are that science and education are strategic categories and determine the quality of human capital and the nature of science and education in the strategic dimension cannot be determined solely by neither short-term market needs, nor by research teams that are narrowly specialized and guided by their own determinants and priorities, education in the strategic dimension cannot be managed according to the rules of crisis management, ad hoc and for market needs.

**Key words:** wisdom (Greek *sophia*), skill (Greek *techne*), education, human capital, management, the principle of contradiction, the code of civilization, the principle of deregulation, the Constitution of the World, paradigm, development, economic growth

### Streszczenie

Celem niniejszego artykułu jest odpowiedź na pytania: na czym będzie polegać zmiana natury nauki? W jaki sposób zmieni się i na czym będzie polegać kształcenie kapitału ludzkiego, gdy natura nauki zmieni się w ujęciu strukturalnym i funkcjonalnym i jakie konsekwencje będzie miało to dla zarządzania wzrostem i rozwojem? Zmiana natury nauki polega na negacji podstawowego aksjomatu, jakim jest zasada sprzeczności TAK ≠ NIE i na zastąpieniu go paradygmatem deregulacji: TAK = NIE = BYĆ MOŻE. Ograniczenie kompetencji wynikających z kształcenia ogólnego może mieć negatywne skutki na wymagającym rynku technologicznym i pozbawić przewag w procesach automatyzacji i robotyzacji, może także deregulować zarządzanie rozwojem i wzrostem gospodarczym. Najważniejsze wnioski wynikające z rozważań są takie, że nauka i kształcenie są kategoriami strategicznymi i decydują o jakości kapitału ludzkiego oraz o naturze nauki i kształceniu w wymiarze strategicznym nie mogą decydować doraźne potrzeby rynkowe, ani zespoły badawcze wąsko wyspecjalizowane i kierujące się własnymi uwarunkowaniami i założeniami, a kształcenie w wymiarze strategicznym nie może być zarządzane według reguł zarządzania kryzysowego, doraźnie i na potrzeby rynku.

**Słowa kluczowe:** nauka (gr. *sofia*), umiejętność (gr. *techne*), kształcenie, kapitał ludzki, zarządzanie, zasada sprzeczności, kod cywilizacyjny, zasada deregulacji, Konstytucja Świata, paradygmat, rozwój, wzrost gospodarczy

---

## Introduction

The subject of this article is justified by two reasons: 1) of an economic nature and 2) of a non-economic, civilization-related nature. They are not inseparable. Categories such as economic growth and development are not inseparable, either, but are not synonymous. Development is a superior category, and economic growth is its component. It is important, however, that there is a qualitative difference between economic growth and development. Development is a normative category, and economic growth is not. The manner of using human, as well as economic and natural capital in the process of economic growth and development can also be highly diversified (Piontek, Piontek, 2017).

These conditions are superimposed by the globalist principle of deregulation and the paradigm: the model of the 21st century 20:80 (Martin, Schumann, 1998). Hence the question: to what extent do the abovementioned differences and conditions influence and will influence the diversification and change in the nature of human capital education for economic growth and development management? Economic reasons justify addressing the topic of this article.

A. and H. Toffler point to the reasons of civilization-related nature in the book entitled *Creating a New Civilization (...): the basis for the monumental political transformation is the transformation of the role, importance and nature of knowledge* (Toffler, Toffler, 1995). A side effect of these conditions is discrepancies in defining key concepts (Papuziński, 2013).

Knowledge is a *product* of science collected at various stages. This *product* includes methodological achievements (science in structural terms). The relationship between science and broadly defined education is based on the relationship between science in structural terms and science in functional terms (Piontek, Piontek, 2016).

If we assume that as a result of transformation, science (knowledge) will change its nature, the need to reflect on the questions that are the purpose of this article is justified:

- How will the nature of science change (knowledge – Latin *scientiae*, Greek *sophia*)?
- How will the education of human capital change and what will it be like, as a result of changing the nature of science, in structural and functional terms and what consequences for the management of growth and development will it have?

Answers to these questions remain closely related to the question: will the priority of education be focused on economic growth or broadly defined development, a component of which is economic growth? The following research hypotheses were adopted in the article:

- change in the nature of science consists of negating the basic axiom, which is the principle of contradiction YES  $\neq$  NO (and in a broader sense, also the negation of constituent norms of the Constitution of the World) and replacing it (them) with paradigms;
- for science (knowledge), this change results in shifting science from the sphere of *sophia* (wisdom) to the sphere of *techne* (skill);
- for the educational process, change in the nature of science (knowledge) results in change in quality of the education of human capital and the restriction of general education;
- the limitation of competencies resulting from general education may have adverse effects in the demanding technology market and may eliminate advantages in the processes of automation and robotization.

Procedures that allow for achieving the objectives and proving the hypotheses adopted in this article are as follows:

- the nature of science in terms of the achievements of civilization;
- the essence of change in the nature of science in structural and functional terms;
- the education of human capital based on the paradigm of variability and its results;
- challenges to preserve the nature of science and the nature of education for development and growth management.

### 1. The nature of science in terms of the achievements of civilization

A starting point for the discussion in the article is the difference between two key categories indicated by the Greeks such as *wisdom* and *skill*.

Citing after S. Świeżawski, we can assume that since the very beginning, the Greeks equated science with the category of wisdom rather than with the category of skill. As S. Świeżawski points out, the word science, understood as wisdom, appeared in the earliest Greek texts, in the works of Homer and Hesiod. At the turn of the 6th and 5th centuries BC, words such as *a friend of wisdom* appeared in the works by Heraklit. With the development of philosophy a remarkably significant development of sciences could be observed, which were gradually isolated from the first field, which was initially considered not only as one science or general science, but which was equated with wisdom (Świeżawski, 2000). As regards the issue addressed in this article, i.e. change in the nature of science and its effects in the process of educating human capital for the management of development and growth, and the achievement of sustainability, this statement is of great importance. Wisdom has always meant the intellectual, spiritual and ethical development of man. It referred to the surrounding reality (things and phenomena). Wis-

dom was focused on getting to know everything that was important, but also looking for the answer *why and how* it exists. These two orientations of a cognitive process led to distinguishing two subsets in science: *causes* and *laws* that should be included in the definition of the category of science.

At the same time, it should be noted that science, in traditional terms, was understood in two ways:

- as a subjective cognitive process, therefore in functional terms;
- as a product (outcome) of this process, it is a coherent system of tasks (statements), that is in objective (structural) terms.

Taking into account the distinguished subsets, science in the functional (subjective) terms is the process of learning things and phenomena by their causes or by laws.

The product (outcome) of research activities described is specific statements (truths and paradigms), usually recorded, i.e. established. Their essence is that they should be linked to a specific system. They should have the attributes of truth and high probability, the certainty of statements formulated.

Thus, in the objective (structural) sense, in traditional terms, science is defined as a coherent system of tasks expressing true, highly probable or certain statements about things and phenomena in light of causes and laws (Kowalewski, 1959; Piontek, Piontek, 2017).

The discussion shows that science defined in traditional terms has been a synonym of wisdom.

The process of educating human capital in the traditional understanding of science comprises education in functional and structural terms as well as causes and laws that science studies. Reflection on the traditional understanding of the *science* category justifies the formulation of two questions:

- 1) Did the Greeks, who equated *science* with *wisdom*, do it correctly and in a justified way?
- 2) What criteria should *science* meet in order to be equated with *wisdom*?

If the essence of wisdom and science is to learn about reality (the world) through causes and laws, further questions should be formulated:

- does the principle of homogeneity or the principle of diversity underlie the existence of the world (of beings, things and phenomena)?
- are there principles (rules, norms, and criteria) of a fundamental nature that determine the functioning of the world in its basic dimensions?

Reflection on the reality that surrounds us allows for noticing that contrary to other views expressed, the principle of diversity (duality, pluralism) underlies the existence of the world. It essentially translates into the processes of development and growth management in both public and private spheres.

The adoption of the principle of diversity was justified in the works (Piontek, Piontek 2017).

The logical consequence of the adoption of the principle of diversity should be the search for fundamental principles that allow for shaping the structural order in the basic dimensions of development and growth management. These principles should not be equated either with determinism or exclusion of any randomness. The representatives of astrophysics and quantum physics are in favor of the existence of principles according to which the world functions and the order is shaped (Kaku, 2018).

Using the principle of analogy allowed in methodology and science as well as a logical point of view, a question should be asked whether it is possible that man – as an entity and a functional being, existing and functioning in the world that is based on the principle of diversity – is not equipped with principles, norms, rules, inscribed in their nature? Such norms enable the proper functioning, allow for defining the sense of human existence and action, ensuring the structural order, sustainability in development and growth management (management is understood as a set of procedures, and man is equipped with competencies to make decisions, and relationality between procedures and competencies define the constituent norms of the Constitution of the World).

The superior position of man as a functional being in the world requires the criteria of norms and principles that enable their functioning and that have the attributes of truth and high certainty in the area of cognition and action.

Thus, if the essence of science is cognition by causes and law, and the essence of wisdom is the functioning of man (a superior functional being) according to the fundamental norms inscribed in their nature, science and wisdom are equivalent categories, and the Greeks understood these categories in a proper way, according to the actual state.

Principles that combine science and wisdom in a compatible way and enable proper education of human capital are norms, the components of the Constitution of the World.

The Constitution of the World is a set of basic norms that define the principles of the functioning of a human being in the achievement of development, that is the meaning of existence and action, including the structural order, understood as the formation of relationality.

We distinguish three subsets in the set of norms of the Constitution of the World:

- 1) axioms, or basic, self-evident statements whose truth does not need to be proven (they are unprovable). They cannot be falsified, either. They are the basis for rational cognition. They are the laws of logic and epistemology;
- 2) natural law – in synthetic terms, it is the dictate to do good and avoid evil, inscribed in the nature of every human being; it directs action (shaping relationality) and has its real dimension, among others in the golden rule of business;

3) superior values are weights (shape preferences), attributed to the variables of choice. Synthetically speaking, the problem of the functioning of the constituent norms of the Constitution of the World can be summarized as follows: these norms protect the existence and control (verify) action in shaping the structural order and sustainability. As regards the issue addressed in this article, an axiom that underlies the principle of contradiction is important. It is a claim that something cannot be both true and false, good and evil, beauty and ugliness. We note this axiom as the principle of contradiction in the language of logic:

YES  $\neq$  NO

Aristotle considers this axiom as the first principle, and G. W. Leibnitz classifies it as the basic principles of rational cognition.

This axiom essentially determines that science belongs to the area of wisdom, not to the sphere of skills. And the notation is the basis for the nature of science in terms of the achievements of civilization and is crucial for shaping sustainability and order in the ongoing processes of automation and robotization as well as requirements in the technological labor market. Thus, it is also of fundamental importance for educating human capital to manage development and growth. K. Bochenek (Bochenek, 2010) also paid attention to the appropriateness of presenting the issue of development in terms of civilization achievements. It should be remembered that a demanding technology market will require more competencies and also even more wisdom.

In this article human capital is defined, in terms of civilization and the economy, as man in their existence and action, in the achievement of development and growth. In this respect, civilization achievements of human capital are a certain value.

## 2. The essence of change in the nature of science in structural and functional terms

The Lisbon Group points to three principles of global competition: the liberalization, privatization and deregulation of the economy (Lisbon Group, 1996).

In this article, the process of changing the nature of science is analyzed and presented in terms of the globalist principle of deregulation. This approach is of great importance for the issue, and it is seldom addressed in the available literature

The principle of deregulation is not something new or unprecedented in the history of civilization. The use of this principle in the process of globalization was recorded in the decree of Antiochus IV Epiphanes, king of the Seleucid family (since 175 BC). The decree was addressed to the whole state, to which he included other nations, also Israel (IMc, 1.1-40):

- everyone has to be one nation,
- everyone has to give up their customs.

A written executive order to this decree contained, among others, a recommendation: behavior according to customs which were foreign to the country. If we compare the deregulation contained in the Antiochus's IV decree with the deregulation of science, his decree was focused on the third subset of the constituent norms of the Constitution of the World, and the deregulation of science is focused on the first subset of these norms (axioms), in particular, on the principle of contradiction discussed above: YES  $\neq$  NO. This logical notation can be explained by the category used by A. and H. Toffler: a code of civilization (Toffler, Toffler, 1995). The above notation (a principle of contradiction) determines the foundations of civilization: truth, good, and beauty. In this sense, it acts as a code of civilization. Therefore, it must be stated that the deregulation of the nature of science is related to breaking a code of civilization. A. and H. Toffler do not explain deregulation, i.e. breaking a code of civilization by pointing out the essence of this undertaking. They describe it by indicating output, i.e. at the output (the effect of the so-called *pipe end*): *propagation of theories, hypotheses, ideas, new assumptions, languages, codes and logical systems* (Toffler, Toffler, 1995).

The principle of deregulation and breaking a code of civilization are noted as follows in the language of logic:

YES = NO = MAYBE

Its effectiveness can be described by the following examples:

- A new civilization is primarily technological in nature (Toffler, 1980);
- It negates the criteria that determine the foundations of civilization (cf. the constituent norms of the Constitution of the World) such as truth, good and beauty;
- In structural terms, change in the nature of science results in change in the content of the *product* of scientific cognition:
  - no real and highly certain statements (this is prevented by the lack of the principle of contradiction);
  - lack of paradigms – a product of cognition by causes and laws with high epistemological value;
  - *the product* of cognition is paradigms for changing conditions and assumptions, formulated institutionally (Kuhn, 1962, Piontek, Piontek, 2017).
- In functional terms – as a process of transfer of cognition procedures and criteria by causes and laws – science is limited in learning the truth and other foundations of civilization, including the sense of human existence and action. A cognition process is focused on changing conditions and individual assumptions (Vatimo, Paterlini, 2010).

- The principle of deregulation makes that science (in structural and functional terms) cannot be equated with wisdom: science  $\neq$  wisdom.

As a result of deregulation and breaking the code of civilization, science changes its nature and is transferred to the sphere of *techne*:

SCIENCE = SKILL

- its material object cannot be the search for truth and high certainty of formulated statements (this results from the notation);
- its object includes the formulation of paradigms (for specific conditions) and assumptions, as well as the fields of technical and technological knowledge.

Science (knowledge) has changed its nature. It has been moved to the sphere of *techne*. The problem lies in the fact that robotization and automation require new competencies and education based on foundations resulting from the constituent norms of the Constitution of the World. The omission of this postulate does not ensure any control or verification of *techne* by *sophia*. In light of the theses formulated by M. Kaku (Kaku, 2018), the above statements and reservations deserve attention.

The deregulation of science, and as a result, an educational process, refers mainly to categories (concepts) through the functioning of many definitions of the same concept and the *newspeak* is possible – the term used by A. Bihl (Bihl, 2008). This *newspeak* results in the fact that today there are no unambiguously formulated theoretical concepts. In practice, this means the possibility of defining categories (interpreting law, facts and phenomena, setting priorities and objectives) depending on the existing conditions and circumstances. It also happens that the same concepts and formulations appearing in different concepts are oppositely understood and this creates chaos. It also results in the fact that priorities formulated and adopted are often vague on the one hand and detached from the real possibilities on the other hand.

A deregulation paradigm noted in the language of logic is implemented in the real sphere, which is reflected in management processes as well as in the sphere of human capital education.

It should also be noted that in the real sphere, a dichotomous method based on the principle of contradiction (YES  $\neq$  NO) is sometimes limited by specific determinants, the possibility of their cognition and a principle (the axiom of the greatest certainty in the decisions made). This results in the notation:

YES  $\neq$  NO  
=

↑

The principle of the highest certainty conditioned by the possibilities of their cognition

However, this notation does not exclude the criterion-related functions of the constituent norms of the Constitution of World and cannot be equated with the principle of deregulation and breaking the code of civilization.

### 3. Human capital education based on the paradigm of variability and its effects

The issue of human capital education in the globalization process and for the management of economic growth and development was addressed in 2007/2008 (Piontek, Piontek, 2007/2008). Then a thesis was formulated that general education should be based on universal norms (currently recognized as norms, the components of the Constitution of the World). As a result of further research focused on the principle of deregulation, breaking the code of civilization and changing the nature of science, the thesis formulated needs to be supplemented and specified. The following questions must be formulated:

- What conditions for human capital education are generated by a globalist principle of deregulation, breaking the code of civilization and change in the nature of science?
- How will the process of human capital education be conducted in new conditions?

A shift of science from the sphere of wisdom to the sphere of skills results in the transfer of education, in structural and functional terms, to the sphere of *techne*.

Presenting the change in the nature of education (in structural and functional terms) synthetically, it should be stated:

- education of human capital limited to the sphere of *techne*, prepares narrowly specialized contractors, which seems to be a threat in the ongoing processes of robotization and automation;
- it is primarily focused on an appropriate rate of economic growth. We do not question the need to achieve the right pace of economic growth, but economic growth, as a component of the category of development, may not translate into development under specific conditions;
- in order to achieve development it is necessary to shape the appropriate relationality between science (knowledge and wisdom) and skill (*techne*);
- not every contractor has to possess knowledge from the sphere of *sophia*, but they should know the basic norms that determine wisdom, which allow for evaluating and verifying activities in the field of *techne*.

At this point it should be noted that the presented discrepancies and changes in the nature of human capital education were noticed by Spanish Professor J. Ortega Y Gasset in his work in 1932, who indicated the proportions between general and sectoral educa-

tion. The change in the nature of science and education was analyzed first of all in terms of generating effects both in the sphere of science and in the real sphere. This article analyzes the issue in terms of causes and assumptions. The presented position does not exclude but even postulates the need for trade-related and highly specialized education at various levels. However, it highlights the need for education that ensures relationality between *sophia* and *techne*, which is crucial for maintaining the structural order in the processes of automation and robotization of the economy and in the demanding technology market. The postulated relationality is also important for the management of development and growth as well as sustainability processes.

#### 4. Challenges for the preservation of the nature of science and the nature of education for the management of development and growth

Analysis and reflection on the principle of deregulation, breaking the code of civilization, change in the nature of science and education justify the question: who is and who should be the guardian of behavior and build the right relationality between *sophia* and *techne* – in the creation of a new civilization?

In the real sphere, a question is: who is or should be the *guardian* of the structural order that includes development – economic growth and broadly defined relationality?

Challenges that today's education faces can be formulated in the form of the following questions:

- to what extent do modern education systems report a need for education in the sphere of *sophia*?
- to what extent does modern society report such demand?
- are institutions responsible for the quality of education prepared to fulfill their functions focused on the sphere of *sophia* and to what extent? This question should be diversified into specific questions:
  - what goals and criteria determined, in the classification of sciences at subsequent stages, the elimination of metaphysics, epistemology, and even logic, and made philosophy exact science?
  - what goals and reasons justify K. Popper's demarcation line, which disqualified philosophy as unfalsifiable and unscientific? The empirical studies by J. Eccles challenged K. Popper's thesis (see: Piontek Piontek, 2017);
  - does the diversification of science into *n* fields and *n* disciplines detached from each other ensure mutual translatability of their

results? What is the openness of modern science to *sophia*?

- what reasons weigh in favour of the fact that in less important fields of science the disciplines distinguished try to function independently of their fields?
- are the standardization of the discovering processes (T. Kuhn's model), the *pointability* as a quality criterion (often obtained by the requirements of citing specific publications, the practice used in most journals in the world) factors that limit relationality with *sophia*?

Formulated questions and challenges are more important than giving precise answers. However, they allow for formulating a conclusion: neither knowledge nor the lack thereof determines the proper nature of science and the nature of education. This is determined by the decision-making will, which is a necessary and sufficient condition for ensuring the structural order and for managing development and economic growth in basic dimensions.

#### Conclusions

Conclusions resulting from the discussion in the article are as follows:

- science and education are strategic categories and determine the quality of human capital;
- the nature of science and the nature of education are closely related. Violating and transforming their nature results in consequences that are difficult to reverse;
- the nature of science and education in the strategic dimension cannot be determined solely by neither ad hoc market needs, nor by research teams that are narrowly specialized and guided by their own determinants and priorities;
- education in the strategic dimension cannot be managed according to the rules of crisis management, ad hoc and for market needs;
- in strategic terms, solutions aimed at temporarily satisfying demand in the labor market should not be created in science and education. Shortages in the labor market should be supplemented by various forms of further training;
- shaping the nature of science and the nature of education cannot be subordinated to exogenous and political influences, omitting any verification and supervision criteria;
- the constituent norms of the Constitution of the World can ensure proper relationality between *sophia* and *techne*, and between science and education, also in the strategic dimension;
- the decision-making will is of fundamental importance in this respect.

## References

1. BIHR A., 2008, *Nowomowa neoliberalna. Retoryka kapitalistycznego fetyszyzmu*, Książka i Prasa, Warsaw.
2. BOCHENEK K., 2010, Some of the Theoretical Sustainable Development Aspects in the Reflection of Christian Middle Ages Philosophy, in: *Problemy Ekorozwoju/ Problems of Sustainable Development*, 5(1), p. 71-79.
3. LISBON GROUP, 1996, *Granice konkurencji/The Borders of Competition*, Poltex, Warsaw.
4. KAKU M., *String Theory*, <http://mkaku.org/home/tag/string-theory/> (12.11.2018).
5. KOWALSKI M., 1959, *Logika*, Pallotinum, Poznań 1959.
6. KUHN T.S., 1962, *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago.
7. KUNZMANN P., BURKARD F.P., WIEDMANN F., 1999, *Atlas filozofii*, Warszawa.
8. MARTIN H.P., SCHUMANN H., 1998, *The Global Trap: Globalization and the Assault on Prosperity and Democracy*, Pluto Press.
9. ORTEGA y GASSET J., 1932, *The Revolt of the Masses*, Norton.
10. PAPUZIŃSKI A., 2013, The Axiology of Sustainable Development an Attempt at Typologization, in: *Problemy Ekorozwoju/ Problems of Sustainable Development*, 8(1), p. 5-25.
11. PIONTEK B., PIONTEK F., 2017, *Development from Theory to Practice*, Shaker Verlag.
12. PIONTEK F., PIONTEK B., 2016, *Teoria rozwoju*, PWE, Warsaw, p. 60-65.
13. ŚWIEŻAWSKI S., 2000, *Dzieje europejskiej filozofii klasycznej*, PWN, Warszawa, Wrocław, p. 404.
14. TOFFLER A., TOFFLER H., 1995, *Creating a New Civilization: The Politics of the Third Wave*, Turner Publishing.
15. TOFFLER A., 1980, *The Third Wave*, Bantam Books.
16. VATIMO G., PATERLINI P., 2010, *Not Being God: a Collaborative Autobiography*, Columbia University Press.

