
Development and Education of Employees in the Light of the Formation of Their Value Systems

Submitted 11/09/21, 1st revision 14/10/21, 2nd revision 30/10/21, accepted 15/11/21

Wiktor Kołwzan¹, Agnieszka Skowronek-Grądziel², Teresa Kupczyk³,
Joanna Hołub-Iwan⁴, Stanisława Ostasiewicz⁵

Abstract:

Purpose: The main aim of the study is to emphasize the role and influence of education on the shaping of human value systems.

Design/Methodology/Approach: The research was based on the methodology of logic, utility theory, statistics and methods of information transfer thanks to modern computer science.

Findings: The methodological approach adopted by the authors to study the relationships between education and the development of human value systems allowed to formulate a conclusion: one can compare the structures of different education systems, compare their diversity (dissimilarity) in the dimension of their value systems, regardless of where they live, because modern media information are able to do so on a global scale.

Practical Implications: Thanks to modern media, a person as an individual has a significant impact on the achievement and implementation of values common in the sense fundamental to people, and on the basis of human knowledge creating a relatively homogeneous system of human education.

Originality/value: The originality of the content of the article is based on the combination and analysis of human value systems with the dimension of education systems through modern computer science.

Keywords: Development, education, information, value system.

JEL classification: M12, M53.

Paper Type: Research article.

¹Department of Management, General Tadeusz Kościuszko Military University of Land Forces, Poland, ORCID: 0000-0003-0181-9344, e-mail: wiktor.kolwzan@pwr.edu.pl

²Department of Management, General Tadeusz Kościuszko Military University of Land Forces, Poland, ORCID: 0000-0003-1296-9663, e-mail: agnieszka.skowronek-gradziel@awl.wroc.pl

³Department of Management, General Tadeusz Kościuszko Military University of Land Forces, Poland, ORCID: 0000-0003-0361-2128, e-mail: Teresa.Kupczyk@awl.edu.pl

⁴Associate Prof., Department of Management, General Tadeusz Kościuszko Military University of Land Forces, Poland, ORCID: 0000-0001-9524-5665, e-mail: joanna.holub-iwan@awl.edu.pl

⁵Associate Prof., Department of Management, General Tadeusz Kościuszko Military University of Land Forces, Poland, e-mail: Stanislawa.Ostasiewicz@awl.edu.pl

1. Introduction

Today's employees expect intensive development, mentoring, education, and knowledge sharing (Żarczyńska-Dobiesz and Chomałkowska, 2014; Gajda, 2017; Moczyłowska, 2016; Aterima, 2017). These things have a significant impact not only on their position in the labour market, but also on their value systems. This issue, despite numerous publications, still attracts lively discussion. Therefore, the purpose of this study is to identify and analyse the development and education of employees in light of the formation of their value systems. In particular, it is education which should play a fundamental role in the integration of humanity. Education should be understood primarily as a ground for shared human values gained through the process of education, the basis of which is knowledge, that is, in its essential context, the truth. The truth is gained through a process of cognition realized through learning, the basis of which is teaching, which is the basis of scientific research and value creation.

Among the most significant values are human individual values and the values of social nature. This issue is dealt with mainly from the side of axiology, utility theory (as the pragmatics of axiology) and logic (emphasizing the role of axiomatization of reductionism) in learning about the world. Therefore, the article is mainly focused on highlighting the role of education and development in shaping (creating) value systems. Tolerance is one of the characteristics of humanism, and therefore of education. Education is also presented through the lens of upbringing seen from the perspective of human needs. Finally, all the problems discussed are analysed from the perspective of individual and social human behaviour which is genetic from the perspective of the theory of psychoanalysis.

2. The Importance of Information, Knowledge, and Development in the Social Dimension

It can be expected that the 21st century has clearly become a period of creating the society of information and knowledge. Information is particularly practical knowledge and is a value especially when it is verified, that is, when it corresponds to the facts. This verification must be done quickly in order to be effective as truth. Even today, information technologies make it possible to achieve this goal to a large extent (Galanc, Kołwzan, and Pieronek, 2016).

But it is also important to remember and appreciate the pragmatic dimension of knowledge. Knowledge (in its logical dimension it is truth) is to be communicated to the society in such a way that it is understood by them and can be quickly verified. Then a threat of, for e.g., terrorism will not exist. A great and important role in this process can be played by the already well-established tool of information

manipulation, i.e., the⁶ so-called fourth estate. The fourth estate is the media, and, in particular, the Internet, which can seriously control the media (Galanc, Kolwzan, and Pieronek 2014).

The above sentences describe information and truth only from the pragmatic side but in general, there is still a valid problem of science. How do we receive knowledge as truth from information? This is a question that modern science is not able to answer explicitly. Language does not assign to these two concepts any specific (independent) syntactic expressions. There are also no strict definitions of either term in science. Yet, colloquially and intuitively, the distinction is relatively easy to make. Information about something (a certain object or process) is contentually poorer than knowledge about that something. Moreover, because of this poorer content, information is easier than knowledge to manipulate and control, i.e., to pass off as true and vice versa in relation to any object or process of real or abstract reality. However, when we have some knowledge, but also, in a sense, information, it is much easier to decide logically and content-wise what constitutes truth and which information is false, what is important and what is less important, etc.

Knowledge constitutes truth, and at the same time is the negation of falsehood, or evil in the human dimension. Terrorism is such an evil, and knowing about it causes a reduction in its use. The above-mentioned pragmatic dimension mainly refers to the issue of how to take care of the security in the society, that is, how to take care of social balance, the game of the two sides, such as the state, the economy of the country, the health and education system, sports, the culture of the country, or the welfare of the whole society and other areas of the life of the nation. Who are the players? The answer is simple. One of the players is a given system (e.g., one of the above-mentioned areas), and the other player is the one who wants to disrupt or even destroy it. But it is also possible to see such a game in another dimension, e.g., in relation to the concept of the State, the government, the parliament, the president – they are the first player (G1), and the society (the citizen) is the second player (G2). Another approach is, for example, the relationship between the authorities and the media (the fourth estate).

The other previously mentioned areas related to system security can be approached similarly. Such approaches actually constitute controversial cooperative games, because although all have the same the country in mind, the goals of the individual players are often different, shared by some and different for others. An example of such a controversial cooperative game can be used here in a purely abstract dimension, i.e., as a model for a possible real game. But the player who wants to disrupt an area (the system) has already been mentioned. They can be:

- Terrorists (the most dangerous player because they generally do not follow any rules of human civilization; they behead innocent people and show the

⁶*Cf. the recent, so-called, fake news published on the Internet and other media.*

executions on the Internet, demolish monuments – destroy Buddha statues in Afghanistan, or blow up the monuments of Palmyra in Syria etc.);

- Competitors (other countries competing for i.e., markets or political and economic influence);
- Political opponents (opposition) having a different vision of governance or the state system.

All these mentioned and very important factors, i.e., game sides, strategies, knowledge, information, should have some platform (set of information) that can be used and then analyse the information contained in it to make the right decision of conduct (behavior), adequate to the situation. This decision will come from the information and knowledge contained in this platform. What is that platform in the modern world. The following subsection provides the answer.

3. Information Technology in Receiving and Transmitting Information and Knowledge

The views presented in this part of the text will begin by emphasizing the role and importance of signs for education (teaching) and by pointing out the importance of information technology for the process of education (the policy of education and the process of education, that is, the implementation of educational programs, mainly constitute the system of human values). It is thanks to programming languages, the great achievement of mathematics, in relation to the new symbolism created by it to represent knowledge, that today it is possible to conduct the teaching process on a much wider scale - in a global dimension. Computerisation was a breakthrough in the history and the mentality of humans, similar to the introduction of printing by Gutenberg in 1450⁷.

Anything new, however, raises some implications, even of a negative nature. And this, too, will be discussed in our discourse on teaching using new symbolism and methods of knowledge transfer and information transformation⁸. In general, however, the symbolism of programming languages has changed and continues to change our relation to knowledge in the form of at least how we acquire, process, transmit and ultimately store knowledge. This new way of capturing and expressing information has brought a new quality to⁹ our lives. and expanded our previous

⁷According to various 1440 or 1450 sources.

⁸Which was signaled in the content analysis of the text's main motto.

⁹It should be immediately emphasized here that an important thing in this process of computerization of knowledge is the acquisition of skills, preferably operational-algorithmic, that is, the acquisition of ways to separate important-fundamental knowledge from unimportant knowledge. And that is, in a sense, the negative side of information automation, because you need get some algorithm to decide what's important and what's not. Not only the form, but also the content of the analysis is important. Admittedly, an encyclopedia of ignorance, or an encyclopedia of what we don't yet know about the analyzed problem, has

diversity (platform) of how we perceive, comprehend, and most importantly present information. New channels have emerged, often more effective than previous (traditional) ways of communicating information. This has greatly influenced changes in human social organization.

More and more people are working from home and communicating with their employer mainly through the Internet. It also relates largely to education. In general, a computer, but especially the Internet (information technology), creates a new dimension of human social organization. This new, modern character of the flow of information between people, has also given us a new name, which is expressed as the information society living also in an additional, new dimension called cyberspace, which is partially real, and partially virtual. The device is real, and the content within it is in some part both, i.e., real and virtual.

These two worlds, the real one and the virtual one, create enormous possibilities in the creation of computer reality for modern people, which at some time will cease to be distinguishable to some extent. Every story has two sides and these two worlds will have to exist side by side. It will also be closely related to the process of teaching, and more generally to the education system, and in the end, most generally, it will be related to the process of transmitting information and creating our human values, because they will ultimately decide about all of us. Global behavior will determine (Wundt's crowd psychology) our fate, but it will happen through information (preferably true).

4. Learning as a Process of Reducing Diversity

The learning process (like many others) is about limiting diversity. It was the Russian physiologist I.P. Pavlov¹⁰ who was the first to notice and experimentally demonstrate that this property also applies to the animal world (Pavlov, 1927). For the formation of associations, that is, for their consolidation and memorization, and thus for the acquisition by the animal of the so-called conditioned reflexes (learned by the animal), Pavlov used the same set of stimuli in one experiment with repetitions: thermal and tactile stimuli and with support of meat powder in the combinations listed in Table 1. The fourth case occurs, as you can see, only in the intervals between experiments. There are eight possible combinations in this experiment, according to the rules of combinatorics. Pavlov used only four combinations, because the essential purpose of the experiment was not to give the entire set of possible combinations, otherwise the animal would have no concrete material to learn. And it was the limitation of diversity that was also an important

been published for some time, but that lack of knowledge also has to come from somewhere and sometimes is very important. Paradoxically, it sometimes means more than the knowledge we already have about the problem. (See: Nosal Cz. S., 1992)

¹⁰ He won the Nobel Prize in Physiology or Medicine in 1904.

feature of such an experiment. In general, it must be emphasized that such learning processes are directly related to the environment, which shapes the process to a large extent. For example, to learn to get through a maze, the maze should have the same shape throughout the whole learning process.

Table 1. Learning through stimuli

no.	stimulus		
	thermal	touch	support
1)	+	+	+
2)	+	-	-
3)	-	+	+
4)	-	-	-

Source: Own work based on W.R Ashby, 1963, pp. 191-192.

Therefore, learning is only effective when the environment exhibits a diversity constraint. In our environment, there are processes in which it is not so much the order of their elements that is important, but other units associated with those elements, that is, sets of two kinds of elements, for example, the letters x, y, and z, and the numbers associated with them, 2, 3, and 5. We give the learner a two-dimensional sequence to analyse: (x,2), (y,5), (z,3), (y,5), (z,3), (x,2), (x,2), (y,5), ... It is a sequence of vectors with two components that exhibits a clear diversity constraint, this constraint provides the basis for learning, i.e., associating relationships between letters and numbers. The absence of such a constraint would be an obstacle to learning, i.e., to associating specific relationships with each other.

Thus, in this example too, learning is possible only insofar as the given ordering exhibits a diversity constraint. Thus, from the examples cited for both the teaching and learning process, the principle of limiting diversity applies (Ashby 1963). To conclude this discussion, Pavlov's example of using four systems out of a possible eight can be expressed logically. We assign logical variables p, q, and r to the stimuli, respectively. We then create a table for the four arrangements of these variables, where the plus corresponds to the value of 1 of the logical variable and the minus, to the value of zero (0). However, for the three logical variables, there are eight total possibilities, so four of them do not have a clearly defined logical value, and this is what constitutes this diversity limitation. They have been eliminated¹¹.

¹¹The value zero or one can be inserted in the place of a dash, so we have 2⁴sixteen additional possible variants of the logical values of the sequence $w_{(p,q,r)}$. But for predetermined constraints such as Pavlov's were inserted in the sequence $w_{(p,q,r)}$, three variables potentially generate 256 systems (each composed of eight combinations of zeros and ones and each different). This constitutes what is known as nature's potential opportunities. And in a particular case, nature itself, or a human, chooses one of the sequences, and sometimes still of limited scope (as given for example in Table 2).

Thus, according to the rule developed by Pavlov, a learning table can be created (Table 2).

Table 2. *The logical dimension of the animal's learning process.*

p	q	r	$W(p, q, r)$
0	0	0	1
1	0	0	1
0	1	0	—
1	1	0	—
0	0	1	—
1	0	1	—
0	1	1	1
1	1	1	1

Source: Own work.

The simple example cited was a prelude to discussing the role of education in the process of shaping (learning) our human values (perhaps even habits) and determining their role, importance, and generally speaking hierarchy in the whole human value system through education.

5. Theoretical and Practical Foundations of Utility Hypothesis in Education and Development

The utility hypothesis was created to evaluate the utility of events, whose occurrence or realisation is only of a given probability. Teaching is a process about the success of which we can't say anything in advance. That is why it is worth mentioning of having methods allowing to assess the evaluation of the learning process by its participants themselves as well as operating with general methods, important from the methodological point of view for the whole process. The didactic process (the practical implementation of educational theory), is a game of two sides with exactly opposite interests, i.e. the teachers and the learners. Profit and loss, here, are the concepts understood in a symbolic sense. The teacher conveys knowledge, and so loses it (symbolically), and the learner acquires the knowledge, and so receives it.

Theoretically, it is a two-person zero-sum game, and the outcome of the game, i.e., winning, can be treated as the utility gained by both sides in such an information exchange process. But utility hypothesis has also been captured in the form of a system of axioms (representing that aforementioned methodology of the educational process), and the teaching process can be considered as a one element of such a system. Events of a random nature occur around us. However, a human being the one who has the above-mentioned second signaling system, as a thinking being, in relation to the events occurring around him/her, has certain preferences (event valuing) to their choice. These are innate preferences – primal (preset, like the primal concepts, for example, in mathematics) or acquired, learned in the course of

acquiring knowledge, or social upbringing (education), or generally gaining life experience (as a result of the aforementioned game)¹².

Axiomatisation is not only one of the fundamental terms in science (its methodology), but it is also a system of concepts in which entire fields of knowledge are expressed. Many areas of mathematics have realized this goal of science, but many other sciences, especially non-mathematical sciences, so far only dream about it. Such thinking, that is, reducing a given field of science to a system of axioms, is the practical realization of the theory propounded on the grounds of the philosophy mentioned above under the name of Reductionism¹³. What are axiomatic systems and what can be obtained as utility once they are constructed? The axiomatic systems of logic or mathematics (because they are the only systems that can represent themselves as such) operate with only a few categories of concepts. This means that there is the division into important (primary) concepts and the concepts which play the secondary role in the given theory, but which can be obtained from the former by means of operationalization (deduction). It can be said that in this relation of the two categories of concepts the theory of reductionism is closed. Reductionism in some dimension is also a limitation of diversity with respect to the classification of concepts, for it is like a recoding of them or a new form that is more economical to the original set of them without order in the representation of knowledge. And we'll talk about that below.

6. The Problems of Representation of Knowledge by Science

Knowledge about the world is researched and results are obtained by various fields of science and life. However, these fields use different concepts, language, and research methods. Any field that studies reality is, with respect to the acquisition of new knowledge for science, important and, in principle, regardless of whether it is a discipline of science or not it is formally related to science¹⁴. Lack of precise definitions of the conceptual system often leads to the formulation of ambiguous properties in relation to the studied objects. But essentially science, or rather its product, which is knowledge, has the property of gathering a vast array of facts from a variety of sources. Therefore, in modern times, even Descartes postulated the need

¹²People, even when they are dealing with a random process from a scientific point of view, also try to find some pattern in it with regard to the choice of one of the options. This problem is widely known from the work of Tversky and Kanneman.

¹³But on the other hand, there are views claiming that this is the wrong way. We do not intend here to settle this problem but only to present an example and its practical significance of the use of the philosophical thought of reductionism in relation to the axiomatics of science.

¹⁴Because, for example, craft provides science (through interviews, surveys, and other means of obtaining information) with an objective basis for formulating knowledge and then use it for scientific analysis.

to conduct a rational research, saying phrase: cogito ergo sum (I think, therefore I am). It is a method of thinking based on mathematical reasoning, regarded by Descartes as a universal and absolutely certain method¹⁵.

This approach is, in a sense, related to another philosophical and methodological concept, called reductionism, which was mentioned above, but in a different way. The concept is to divide scientific knowledge, represented by laws, properties, processes and other objects, into two dimensions, namely, into knowledge: important – primary and less important–secondary in relation to the former, which can be obtained from it. It is a postulate that has an eminently philosophical and methodological character, because it is relatively easy to proclaim views, but it is more difficult to realize them in practice of scientific activity.

However, this idea has the dimension of Cartesian rationalism, because reductionism proclaims the need to organize knowledge. This need is particularly necessary in science in its present form science is fragmented and a lot of attention is paid to experiments, and in order to work out the results, methodologically compact tools constituting synthetic knowledge are needed. The tools provided to science by the probability theory and mathematical statistics, which in particular has the widest practical application in the field of mathematical sciences, are not universal but, although they are accurate, they only allow approximate decisions to be made with regard to full knowledge of the reality under study. The problem is that randomness is only local in the processes occurring in the surrounding human reality. This is indicated by the results obtained from scientific work on dynamical systems (Peters, 1997).

Many fields of science and even everyday life recognize the need for reductionism, although there is also a distinct philosophical view that proclaims the opposite of the philosophy of reductionism. Proponents of such thinking cite the advances of modern science and argue that reductionism is wrong. Admittedly, neither the proponents of reductionism nor its opponents have proof in favour of their views, as in both cases they have only the character of a philosophical postulate. It seems rather strange, however, in the context of the scientific discussion of reductionism, that the idea of this concept, called philosophical, has been realized by some disciplines of mathematics and logic in the form of putting them into the dimension of an axiomatic system, while no humanistic, social, economic, or experimental

¹⁵*It was the 17th century, and thus distant period in terms of the way science is viewed by modern methodology, but it is mathematics that today contributes to the development and interpretation of research results in numerous areas of science. We can show an example of the use of statistics in numerous areas of experimental science. Statistics was created by mathematics and that is why it is rightly called the Queen of Science. But why do we cite Descartes' views? His Discourse on Method talks about mathematical thinking. A consequence of this thinking are the so-called mathematical formulas. Regardless of time, mathematical results do not change. The Cartesian system is still valid today.*

science has done so. Opponents of reductionism are more closely associated with these sciences than with mathematics or logic. Their arguments are not unfounded, but neither can the arguments of the formal sciences be denied logical reasoning.

It should additionally be emphasized here that reductionism has managed to achieve propositional calculus in an ideal way because the axiomatics of this branch of logic and science meets all the methodological requirements posed to axiomatic systems (Grzegorzczuk, 1969). So, now a system of concepts of axiomatization will be presented. These are the most often:

- primary concepts (accepted without defining them and carrying obvious content),
- Axioms (accepted without proof, also self-evident),
- definitions (new concepts formed from primary concepts and axioms and other but previously defined concepts).

In addition, the original rules for operating the concepts of such axiomatic systems are also assumed. For example, in the propositional calculus, such rules are: the rule of detachment, the rule of substitution, and the rule of definitional substitution. This small set of concepts allows one to theoretically obtain any theorem of a given axiomatically formalised domain of knowledge. The set of laws of a given science is called a Theory in the methodology of science. An example of such an axiomatisation with reference to the utility hypothesis is presented below.

7. Axiomatics of the Utility Hypothesis

Utility hypothesis as a field of knowledge can also be expressed in terms of the axiomatic system concepts mentioned above. We treat¹⁶ the events A, B, C,..., X, Y, Z, as primary concepts as in probability theory. The next levels of this system are definitions and axioms. We will first focus on definitions. These include two concepts, namely the preference and indifference relation with respect to the original event domain. For the two relations mentioned, we take the p and o designations, respectively. The next levels of the axiomatic system of utility hypothesis are axioms and definitions. We will first focus on definitions. These include two concepts,

¹⁶Primal concepts are not defined, nor are they properly interpreted, because they theoretically have a simple understanding of them (at least there is such an assumption about them). But on the other hand, these are often scientific terms that are associated with certain fields of knowledge, so questions can be raised as to how they should be understood from the point of view of other branches of science and of everyday life, where the understanding of such terms may not be obvious. But on the other hand, you have to approach this problem rationally, to put it pragmatically. It can be assumed that these are the most ordinary events, scientific in relation to science, and simple in relation to everyday life. Comment: a scientific event as primary, and a colloquial event also as primary, need not translate mutually into primary in both dimensions.

namely, the relation of preference and indifference with respect to the original domain of events, or primary concepts. For both of these relations, we take the p and i designations, respectively. The content and formal understandings of these relationships are captured in the following form:

Definition 1: For any two events A and B , there is an $A p B$ if A is preferred over B . We denote the event opposite to p by $\text{non } p$. We assume that A and B occur when $A \text{ non } p B$ and $B \text{ non } p A$.

Axioms of utility hypothesis:

The relations p and i satisfy the following axioms:

1. For any two events A and B , exactly one of the relation appears:
(α) $A p B$,
(β) $B p A$,
(γ) A and B .
2. A and A for all A
3. If A and B , then B and A .
4. If A and B and B and C , then A and C .
5. If $A p B$ and $B p C$, then $A p C$.
6. If $A p B$ and B and C , then $A p C$.
7. If A and C and $B p C$, then $A p C$.

Axiom 1, constitutes a consistency relation, it is also called the law of trichotomy. Axioms 2, 3, and 4 conclude that the indifference relation (i) satisfies the principle of equivalence. Axioms 5, and 1, state that a relation p is a partial ordering of a set of events. The last two axioms, namely 6, and 7, say that p is transitive with respect to i .

The adopted set of axioms introduces a partial order to the set of utility. In the so-called rational choice (social) it implies that it is a weak linear ordering of the considered elementary event area. It orders these events from most desirable to least desirable, that is, symbolically speaking, if there is a relationship $A p B$, it practically means that A has more utility than event B .

In practice (theoretical) it means that e.g., the user of an electronic learning system has the possibility to choose for himself the best option - a set of curricula available to him (in reality they are somehow ordered, they have the above mentioned partial order)¹⁷. The presented utility axioms express utility, only on an ordinal scale of the type: earlier, later, simultaneous (equivalent). In this view of the concept, there is no way to determine what action will be taken by a certain social group, decision-maker, learner, and more generally what decision has been made, that is, what are the pragmatics of a given decision.

¹⁷Do not forget that rankings are statistical and axiomatics are general.

8. Axiomatics of Social Choice

In 1951, K.J. Arrow (1951) formulated the axioms of so-called social choice. They are like a complement to the theory of utility captured in the form of axioms. And below there is the logical structure of this approach presented. Here, what is considered is a group of m individuals who face a choice among n possibilities:

$$X_1, X_2, \dots, X_n$$

Just as the essence of the axiomatic approach has been described earlier, so here too we take primary concepts, definitions, and axioms.

Definition 1: By individual preference profile, we mean a function that assigns to each person i (out of m) some ordering of these possibilities.

Definition 2: By a social welfare function we mean a function F that assigns a certain (social) ordering to each profile.

The following axioms are assumed¹⁸:

A1. The F function is specified for all profiles.

A2. For a given profile X_j is preferred by F over X_k . Then X_j will still be preferred over X_k if the profile changes as follows:

- a) the mutual ordering of possibilities different from X_j does not change.
- b) In each individual ordering, the position of X_j improves.

A3. Let \mathcal{G}_1 be a subset of the set of possibilities

$$\mathcal{G} = \{X_1, X_2, \dots, X_n\}.$$

Suppose the profile \mathcal{G} changes so that the mutual ordering of elements \mathcal{G}_1 remains unchanged. Then the social ordering F will also leave the mutual ordering of elements \mathcal{G}_1 unchanged.

A4. For each pair of possibilities A_j and A_k , there is a profile for which the social ordering prefers A_j over A_k .

A5. There is no such person i that for all A_j and A_k social ordering prefers A_j over A_k , if only i prefers A_j over A_k .

9. The Pragmatic Dimension of Distant Learning

The above presented axiomatic theories concerning the utility hypothesis and the theory of social choice should be interpreted pragmatically in the aspect of one of

¹⁸Note, however, that Arrow's axioms are contradictory if only $n \geq 3$, and $m \geq 2$ (Owen 1975, p. 120)

the objectives of the text, namely in relation to the process of education, or the educational system in general, seen from the level of human systems of values, as more general than education in the sense that they are the basis for the subsequent education of individuals and whole societies¹⁹, in various dimensions, and above all in relation to economics (securing the basic needs of the society). There are schools, universities that are known as leading (through rankings), and they are also preferred, so this is consistent with the axioms of social choice cited above.

However, there are less known schools, whose graduates achieve significant success in the generally understood job market (because politics, for example, is also a very special job market, Mrs. Angela Merkel educated in DDR, has one of the most important roles in politics on our globe). So how do the axioms of choice relate to these events in this dimension? That is not all. In the introduction, we emphasized the need for humanity to acquire a common consciousness for the foundations of our human values through education.

Therefore, on what principles should (through axiomatics, or other measures) the rankings of universities and other Organizations dealing with the education, and in general with behavior, that is, preparing us to acquire the ability to best satisfy the needs understood in the dimension of positive conduct of life be established? Axioms are supposed to be independent, non-contradictory, and no two contradictory conclusions can be drawn from them; moreover, they are supposed to generate the laws of a given science. With respect to the second category of values, and education falls within this dimension, it is useful to raise questions about the meaning of axiomatics when it is not complete (at least from the standpoint of the requirements of logic). If one were to approach the learning process purely axiomatically or more generally formally, then, in keeping with the essence of axiomatic formal systems, individual systems of education could be measured, ordered, and measures of their utility introduced.

It seems, however, that the formal account presented here should not be abandoned because it is generally cognitively fertile, but pragmatics dictates that statistical measures should be used in this dimension to measure the human diversity (Ashby, 1963) of choice. Furthermore, education as a process is not economics, but the value of the school and of the learning systems is judged secondarily by the labor market, which is measured economically.

The globalization of the world places market demands on education. A well-prepared curriculum allows graduates of a given university (school) to protect themselves from social exclusion so dangerous in the present era. So the absence of

¹⁹*The values given to a child by parents about the role and importance of education in meeting later needs and social roles (tenure) have a huge impact on whether the child wants to pursue education.*

exclusion is very much about the broader safety of the individual, the school and even the education system. For that, you need a broad learning platform. It can be realized in a measurable way through an additional information channel that is distant or e-learning. To achieve this, it is necessary to have statistical and forecast data of the directions of the labor market for the next few years, i.e. the demand for particular professions. Directions for politics, economics, religious tolerance.

The above observations are not only relevant to the dimension of a particular university, but also have relevance to the educational managers of a country because, after all, the level of education is a fundamental part of its security. And if they are relevant for one country, then for other countries as well, because it is possible, as mentioned above, to create a homogeneous educational base for all of us. It is generally known that education is an investment that pays for itself after some time. It is worth investing money in programmed learning which is e-learning. It is a costly and, above all, labor-intensive process, requiring a great deal of knowledge and teaching experience from those preparing such instruction.

Teaching materials should be designed in such a way that the learner does not have to refer to other sources of knowledge too often (and the literature sources themselves should be representative). In the 20th century, we had market competition, the 21st century will be an age of competition for the knowledge we have. It will be the age of information. Internet lectures that are interesting and relevant to the job market are an important measure of a school's value, so the Internet is a 20th century value, and distance learning will be one of the important intangibles of the 21st century, measured on the scale of economics, or in material terms. One can venture a prediction that these intangibles will be global in scope (in the positive sense of the world globalization agenda).

Forecast: The educated person of the 21st century does not have to be a graduate of one particular university. He can be a graduate of the educational system of his choice that provides him with the knowledge he needs for his profession in his choice of any university in any country, that is, he can acquire it at many universities, not just one. So he can shape his own preference profile in the future and make (social) choices in the given set of possibilities available to him. In a way, Arrow's axioms of social choice can be realized here, in a pragmatic dimension. And while Arrow's axioms don't actually provide any metrics, they do provide a vision for shaping oneself for the future through a socially organized education.

Society, is an organization with its own complex and complicated certain order, in which rules are kept, and they are realized through the possibility of choice with the rules of this naturally and conventionally established social order. After all, the realization of one's educational profile should be guaranteed through internationally established structures and organizations.

Conclusion: Statistics is a practice - it confronts theory with reality. Axiomatics is a vision that is realized statistically, and therefore not ideally, but practically. Both approaches, however, are valid and neither should be placed on a different ordinal scale, and can even be said to be complementary to each other, because they have in mind a common language of science as a representation of how we humans see the world (reality). As for the moment, such a language is only virtual, we have seen from the analysis of the circle of sciences. As for the given time, rather than talking about the language of science, it is necessary to tolerate through the concept of coherence different visions of social order, which, however, have in common a part of social views, which are primarily embedded in Man's innate Nature, in his Ontology of innate values.

10. Conclusions

The value of the learning process in the 21st century will be assessed through the lens of economics. This should be understood in the following way: it is not only expert evaluations, but also the labor market that will be the yardstick for assessing the preparedness of an individual (in the dimension of the subject as well as the organization) to function in society. This will cause strong competition not only between people and universities, but also between countries, due to the increasing globalization of the world. The above challenges should be taken into account when defining major strategies for the development of education systems.

The education systems of individual states should be components of the education system of the entire globe, and conversely, the entire education system of the Earth should do justice to the education systems of individual states. From a logical point of view, the idea here is that an one-way implication – a simple one, accepted as true – should affect the other – the opposite of it, but also true. You have to believe that this is achievable. Otherwise, disagreements between nations will be on a larger scale than they have been and so far. A common education system, or similar systems, will contribute to shared values.

References:

- Arrow, W. 1979. *Eseje z teorii ryzyka*, PWN, Warsaw.
- Ashby, W.R. 1963. *Introduction to cybernetics*. PWN, Warsaw.
- Galanc, T., Kolwzan, W., Pieronek, J. 2016. Informatics systems of decision support and analysis of their security. *Operations Research and Decisions*, 26(1).
- Gajda, J. 2017. *Oczekiwania przedstawicieli pokolenia Z wobec pracy zawodowej i pracodawcy*. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, No. 491, Wrocław.
- Galanc, T., Kolwzan, W., Pieronek, J. 2014. Role of the normal logical form in decision making and knowledge management. *Operations Research and Decisions*, 24(2).

- Galanc, T., Kołwzan, W., Pieronek, J., Skowronek-Grądział, A. 2016. Logic and risk as qualitative and quantitative dimensions of decision-making processes. *Operations Research and Decisions*, 26(3).
- Moczyłowska, J.M. 2016. *Organizacja inteligentna generacyjnie*. Difin, Warsaw.
- Aterima, H.R. 2017. Report: Zawodowy alfabet pokolenia, czyli młodzi w pracy. <http://www.aterima.hr/raport-pokolenie-z>.
- Pavlov, I.P. 1927. *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex*. Translated and Edited by G.V. Anrep, Oxford University Press, London.
- Peters, E.E. 1997. *Chaos Theory and Capital Markets*. WIG-PRESS, Warsaw.
- Grzegorzczak, A. 1969. *An Outline of Mathematical Logic*. PWN, Warsaw.
- Owen, G. 1975. *Game Theory*. PWN, Warsaw.
- Żarczyńska-Dobiesz, A., Chomałowska, B. 2016. Zarządzanie pracownikami z pokolenia paradoksów. *Nauki o Zarządzaniu*, No. 2, Wrocław University of Economics, Wrocław.