

THE 'MARIBOR CONCEPT' OF SYSTEMS EDUCATION: SPECIALIZATION WITHOUT OVER-SPECIALIZATION

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ABSTRACT

Over 40 years, we have been practicing teaching of systems thinking and behavior to students of economics and business as well as to other professions. We are briefly presenting our course syllabus, our method of teaching, and our reasons for our program. Basically, we have been facing the following situation: both the ancient and modern fight for supremacy of either narrow specialization or the holistic/systemic thinking is not over, although it makes no sense: everybody needs a double capacity:

- A profession, which is a narrow specialization unavoidably; and
- Systemic behavior/thinking, which supports co-operation of narrow specialists on their way to the equally unavoidable requisite holism of them as mixed teams.

Keywords: specialization; systems thinking/behavior; University of Maribor, Slovenia

INTRODUCTION

In Fuschl 2006, The International Federation for Systems Research decided to work more on promotion of systems education. So did ISSS in 2009 in Brisbane. In Pernegg 2010 this effort was taken another step forward. Unfortunately, we were not able to join the colleagues in Pernegg. We offered them a text. This is a more elaborated version of it. It results from 40 years of our experience of teaching courses on Systems Theory at several universities in 6 countries and 30 years of its application in our work with organizations as their consultants on innovation management in close to 500 cases in several countries.

SPECIALIZATION VERSUS OVER-SPECIALIZATION

Human behavior consists of monitoring, reflection, thinking, emotional and spiritual life, creation, routine, decision making, communication, and action. It is based on human knowledge, values and circumstances. The contemporary unavoidable narrow specialization causes humans to capture only a part of the actually existing attributes, while other attributes may be subjects to oversight that may lead to failures – from relatively small ones all way to world wars and end of the human and other life on the Planet Earth. This is why the (General) Systems Theory was created – to prevent oversights by fostering the worldview of holism of approach and related methodology aimed at wholeness of outcomes of behavior.

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L. van Bertalanffy wrote explicitly (1986, ed. 1979, p. VII) that his systems theory had been **originally intended to overcome current over-specialization**. He found his intention abused by making systems theory one of many specialized and technical disciplines. He might feel the same way much more today, when systems theory is fragmented in many and the original intention is taken care of in very few of them.

Over-specialization differs from the unavoidable specialization: over-specialists are closed inside their own single viewpoint; other specialists are open to interdisciplinary creative co-operation in order to overcome one-sidedness and to come closer to holism in their approach, and resulting wholeness of their outcomes. Such behavior was typical also of the practice of the most famous pioneers of cybernetics (Hammond, 2003).

The quoted fact about the Systems Theory itself speaks of the »uncommon sense« Bertalanffy has been speaking for (Davidson, 1983): he was fighting the common current practices of one-sidedness, because they were dangerous and still are so with a growing trend. If over-specialization is common, interdisciplinary cooperation cannot lead the way to holism by synergy of individual disciplines and related values/culture/ethics/norms. Though, more holism and less one-sidedness inside the traditional and newer disciplines of science and practice are also helpful.

Equal conclusions can be made about cybernetics: it was created in interdisciplinary creative cooperation. It is now also fragmented in many, partly by specialization, and partly by over-specialization.

In practice, systems behavior, especially its part called systems thinking or systemic thinking, can exist naturally as a human attribute, which very few persons attain; others must and can learn it. Its basis is systems theory as a science, profession, and practice of integration (Hammond, 2003) of partially considered attributes and of mutually different and therefore complementary specialists of various disciplines, professions, and practices. Thus, researchers and/or practitioners can attain the requisite holism of their behavior and requisite wholeness of its outcome (see some details about ‘requisite’ below or in Mulej, 2007).

BASIC CONTENTS TO BE COVERED IN TEACHING OF SYSTEMIC BEHAVIOR

Capacity to be attained

On the above basis and due to the fact that the currently surfacing long-term and growingly threatening socio-economic and environmental crisis of humankind cannot be solved without application and integration of mutually different specialized capabilities of humans, it is extremely necessary for humans, especially the influential and decisive ones, to make their transition from a biased/over-specialized to a requisitely holistic behavior of specialists.

‘Co-operative persons’ are much better suited to lead this transition than the ‘free-riders’, both of these groups including about 15-20% of humans each, while the rest are passive with a ‘wait-and-see-attitude’ (Lester, 2005).

In the current phase of humankind’s existence, the systemic – requisitely holistic – behavior is at least as necessary as it used to be in times encouraging Bertalanffy to create his General Systems Theory. He lived through both world wars and the big

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depression. All three can be viewed as consequences of one-sided rather than systemic behavior. The current crisis is even worse. The crisis tackles the humankind's running out of drinkable water, healthy air and soil, un-renewable natural resources, the dangerous climate change by renewal of climate in which humans cannot live, the danger of higher sea-level chasing hundreds of millions of people to other locations, disappearance of unavoidable bio-diversity, etc. One-sided approaches cannot solve these problems, while the requisitely holistic ones can (Bozicnik, Ecimovic, Mulej, 2008; Brown, 2009; Dyck, Mulej, 1998; Ecimovic, Mulej, Mayur, 2002; Goerner et al, 2008; Harris, 2008; Korten, 2009; Martin, 2006; Taylor, 2008; Mulej, 2010; etc.), but they can do it better in synergy of these and similar references than individually; see: attachment.

The educational programs enabling/supporting systemic behavior are necessary on all levels of primary, high school, and higher education to promote collaborative behavior aimed at requisite wholeness. This does not mean that any education for a specialized capability may be abandoned or even banned; it rather means that education must enable both a specialization and capability of integrating several specialized capabilities by the worldview of holism and related methods, especially of interdisciplinary creative co-operation as a means of systemic – requisitely holistic behavior of humans as decision making beings.

Holism – fictitious, requisite, and total/real

Holism – in the full sense of the word – includes totally all existing attributes with no narrow specialization inside any profession or science. Thus, holism reaches beyond human natural capabilities, which has caused human specialization in many professions and sciences. The good consequence of it is the human capability of detailed insight inside a single viewpoint, profession and/or science; the dangerous consequence is the oversight of all other existing and impacting attributes. Some of them are focused and covered by other viewpoints, professions and sciences, but effects resulting from their relations normally are not. E.g. chemicals are reported to be tested on safety with no regard for their synergies (Brown, 2008; Taylor, 2008). This is where systemic behavior enters the scene to cover the blank. Right now, this blank endangers humankind's existence: humans either accept the practice of systemic behavior or leave to our children and grandchildren (in any at all) a dying Planet Earth (Taylor, 2008).

This means that holism/wholeness, if limited inside a single viewpoint, profession and/or science, faces the danger of being fictitious with the dangerous consequence such as the oversight of other crucial attributes. Therefore this is helpful, but not good enough, often.

Therefore one needs to consider the 'Mulej/Kajzer law of the requisite holism of approach/behavior' (Mulej, Kajzer, 1998; Mulej, 2007) providing for a middle way between the impossible real holism and the dangerous fictitious holism. Practically this means that one must first collect insights into all viewpoints, professions and/or sciences that are found or deemed crucial, their interdependencies and resulting synergies. The system, as a synergetic network, of all crucial viewpoints is called the dialectical system (Mulej, 1974; Mulej et al, forthcoming).

In other words: Bertalanffy's 'worldview of holism/wholeness' should better be transformed into the 'worldview of the requisite holism/wholeness'. Authors, researchers, managers and other practitioners must take responsibility for their selection of viewpoints,

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professions and/or sciences that are found or deemed crucial, their interdependencies and resulting synergies. Therefore they must first pay a requisitely holistic attention to their own starting points of this process, leading later on to definition and realization of their objectives of their actions.

Topics to be covered

Thus, the very first topic to be covered in the systemic education is awareness of oversight resulting from the usual limitation of humans to a single viewpoint in terms of the usual over-specialization that has been the common sense so far. This is done with a case by:

- (1) Choosing any topic,
- (2) Collecting all possible various viewpoints to consider the selected topic,
- (3) Collecting the relations between them, especially the interdependences rather than, or along with, one-way dependences,
- (4) Collecting all visible synergies resulting from them, and
- (5) Comparing the level of wholeness of insight and outcome attainable with this procedure versus the one limited to a single viewpoint. The latter is much simpler to do, but much more complex consequences result from oversights caused by the observer's or researcher's or manager's or user's approach limited to a single viewpoint.

On this basis the basic vocabulary about systems' and models' typologies and related boundaries, processes and similar necessary formalities should be covered in order to provide a shared language for a clear description of attributes and dynamics/processes and related structures should be added.

Methodology or several methodologies of requisitely holistic behavior, aimed at fighting the crucial oversights are the next crucial ingredient. Their selection may differ according to their suitability for students of different professions/specializations, especially in terms of details of study. Never should a single systems theory or cybernetic alone be covered at an elementary university level, and never should formalities of description of objects under discussion with systems and models be found sufficient. Everybody should receive insight and training in methodology of creative cooperation supported by team work and insight in 5-6 systems theories and cybernetics theories (if the course's time does not allow for more).

Depth of elaboration

Depth of elaboration might well be divided into the three levels suggested by Jones et al (2009), which are: 1. Sense-making; 2.1. Practical Mastery; and 2.2. Theoretical Mastery, and divided into A. Discipline-integrated; and B. Generic.

Program for K-12 exists and works well (Discussion in the network of systems educators on 15 July 2009, ISSS, Brisbane, AUS). Thus it should be diffused. Its basis is the capacity of humans to listen to each other when and because they are not of the same opinion on the topic under their consideration, thus developing their capability and experience of creative cooperation.

Teachers of various courses who work with the same students in parallel should develop their practice of linking their courses to each other for students to learn about interrelations, especially interdependences of various and different kinds of knowledge.

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The latter – all of them – transfer to students some knowledge about life, but specialize in different viewpoints and therefore different and often separately considered parts of the existing really and interdependent attributes.

Programs for higher education differ, as authors of systems theories and cybernetics differ, and there is rather fragmentation than a common shared basis. The latter may not be applied for anybody to impose a single approach. Insight into Encyclopedia (François, 2004) from such a viewpoint shows that the existing systems theories are actually complementary to each other rather than competing, because they have been authored from different selected aspects or viewpoints.

In general, systems theories could be divided into three groups, although they are rather interrelated than separated in real life:

1. The 'hard systems theories' are meant to support natural and engineering sciences by precise, often mathematically supported, descriptions of natural phenomena and their application for very reliable products and other arte-facts. In these cases the requisite holism is focused on attributes of elements, processes and structures of these natural phenomena, products and other arte-facts as well as processes of their making both in nature and under human intervention. Their relations with their environment, both natural and social, are unavoidably added.
2. The 'soft systems theories' are meant to support non-engineering sciences by framework, rarely mathematically but though realistically captured, descriptions of social and humanities' phenomena and their application for social life apart of making products and other arte-facts. In these cases the requisite holism is focused on attributes of elements, processes and structures of these social and humanities' phenomena, as well as processes of their making both in humankind's social nature and under human intervention. Their relations with their environment, both natural and social, are unavoidably added.
3. While both hard and soft systems sciences may often be confined behind the boundaries of traditional disciplines – with full right and a lot of benefit, these boundaries rarely enable them and their users to fully meet the objectives due to which systems theories and cybernetics have come into being. This is – let it be stressed again – prevention of oversights resulting from one-sidedness, which can neither cover attributes outside the selected territories of the traditional disciplines nor their relations, interrelations, interdependences and synergies. The 'integrating systems theories' play the latter role. Their relations with their environment, both natural and social, are unavoidably added.

On this basis, a selection of systems theories suiting the selected specialization/profession should be added, and a link to that profession should be provided with applied cases. Basic attributes of all three kinds of systems theories should be presented, and the suitable ones elaborated in requisite details.

THE PRACTICE OF THE UNIVERSITY OF MARIBOR, FACULTY OF ECONOMICS AND BUSINESS (EPF), MARIBOR, SLOVENIA

Teaching of systems theory started in 1970/71. Over 40 years the program has been changing. (Mulej, 1971; Mulej, 1979; Mulej et al, 1992; Mulej et al, 2000; Mulej, Ženko, 2004; Mulej et al, 2008; Mulej et al, forthcoming). Syllabus of the course SYSTEMS THEORY includes now (since 2000):

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THEME 1: Interdependence as the Basis of (Contemporary) Life; Comprehension and Mastering of it by Application of Systems Thinking and Systems Theory

THEME 2: The Dialectical Systems Theory

THEME 3: Some Other (Soft)-Systems Theories

3.1 Information and System: Essence, Form and Importance

3.2 Cybernetics of the Zero, First, Second, and Third Order

3.3 Viable Systems Theory and Model

3.4 Complexity of Business Processes and Possibilities to Master it

3.5 Soft-Systems Methodology

3.6 Critical Systems Thinking

3.7 Living Systems Theory

3.8 Chaos Theory

3.9 Complexity Theory

THEME 4: Application of Systems Thinking to selected Topics

4.1 Standardization of Business Decision Making

4.2 Innovation from the Viewpoint of the (Dialectical) Systems Theory

4.3 USOMID Methodology for Creative Co-operation by Informal Systems Thinking

4.4 Ethics of Interdependence, Requisite Holism and Innovative Business

4.5 (Total) quality – a Challenge for Innovation and (Informal) Systemic Thinking

4.6 Summary of the Basics of Systems Thinking and Theory and its Informal Use

Along with Systems and Innovation theory, students at EPF are offered Operation Research, Project Management, Quality Management, Organization and Management, which may implicitly foster systemic thinking as well.

Our publications list can be found on <http://izum/Cobiss/Bibliografije> under our names.

THE METHOD OF TEACHING SYSTEMS THINKING AT EPF

We devote half time to lecturing and half time to practicing. Students must apply all insights from their readings to a case worked on throughout their term with us; they must do it team-wise, and all topics are structured in six steps of the USOMID-SREDIM procedure of creative work and co-operation. We grade them on a weekly and term basis, and return their week-papers for them to correct any mistakes and to learn from mistakes until perfection, which is what they want and are required in the contemporary market.

SREDIM is the acronym including:

1. Select the problem for your consideration; it requires students to practice creative team cooperation to define their interests and expose problems all way to sharing a decision, writing their objective and subjective starting points and conceptualize their framework procedure from starting points via objective toward foreseen outcomes.
2. Record data about your selected problem; like in the S-phase they now apply appropriate part of their learning material and experience to pin-point facts. The question 'why' is waiting for the following-up E-phase.
3. Evaluate collected data; other parts of the learning material are now applied for analysis in which the question 'why' is central for authors to switch from a superficial to a deeper insight in order to discover the essence hidden behind data.

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4. Determine and develop solution/s: analytical findings are judged comparatively for the relatively best solution to be determined; the best one is developed for implementation, again with another part of the learning material.
5. Implement the solution: the practical use of the solution is modeled by the team in their creative interdisciplinary cooperation, again with another part of the learning material.
6. Maintain the implemented solution: the novelty can hardly become a sustained innovation, if no requisitely holistic care is taken for the novelty to become an accepted habit; this modeling takes place with another part of the learning material again. At the same the unsolved or resulting problems are discovered for the SREDIM procedure to enter another circle.

The word USOMID enlarges the original acronym (Mogensen, 1980) because we added to the six steps of work four steps of co-operation that we found missing. They are used in every of the six SREDIM steps and include:

1. Individual thinking and writing; thus, the team is building up, nobody is too loud in discussion, and nobody stands aside without contribution. Unlike the brain-storming and brain-writing methods, this includes the S-step for team members to define and therefore to own the selected problem.
2. Circulation of notes; thus, the team transcends from a survey style of insight and creation to a synergy, because everybody is invited to add ideas to the ones written by others before.
3. Discussion after circulation: in this phase the team comes to sharing the ideas collected and commented by everybody earlier, with discussion added and finalized as a synergy.
4. Minutes after discussion: in this phase the agreed upon final solution is written to be applied in the next phase of the SREDIM procedure.

An updated novelty was offered by Mulej Matjaz and Nastja (2006).

SOME REASONS FOR OUR TEACHING SYSTEMIC THINKING IN THIS WAY

Human being is an influencing being, adapting her environment to her perceived / preferential needs and desires. That’s why we will first briefly discuss cybernetics.

Cybernetics is a science and practice of influencing / controlling / managing features, events, and processes that make a dialectical system as follows; they:

1. Are complex or very complex, i.e. have multiple relations, internally and externally;
2. Are open, i.e. have relations with their environments, especially interdependencies, including the ones between different viewpoints of consideration of the same reality;
3. Are dynamic, i.e. able to change, including the observers, decision-makers, and impacting actors;
4. Take inputs as well as produce outputs – impacts by information rather than by material/energy flows only;
5. Support, stabilize, and simplify these flows by feedback loops;
6. Are mentally, explicitly or implicitly modeled from the selected (set or system of) viewpoint/s.

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Cybernetics cannot be reduced to feedback loops alone neither to modeling alone, but it rather takes all six attributes mentioned as one synergetic whole. Thus, cybernetics is one of many specialized disciplines on methodology of thinking and action that (1) are needed when dealing with any complex process, and (2) need to be requisitely holistic, and can hardly be so, very often, if left alone rather than acting in interdisciplinary cooperation with other specialized disciplines. – Here, systems thinking becomes necessary to cybernetics, and therefore also to the dealing with innovation, as we have and still do. Innovation, too, is a process that has to do with relations between parts of society and meets all six criteria briefed above (as a dialectical system, of course).

This conclusion brings us to the General Systems Theory. At about the same time as the initial authors of cybernetics, another group with L. v. Bertalanffy (LvB) was working on a new worldview called the General Systems Teaching / Theory (and related methodology supportive of making holism happen). One of his crucial sentences says that humankind has a poor chance to survive if we do not think and behave as citizens of the world rather than of single countries, and if we do not consider the entire biosphere as one whole. For this reason it is necessary to supplement and/or fight the modern exaggerated (!) specialization, obviously by inter-disciplinary approach and isomorphisms – since there seems to be no other way toward survival (See: Bertalanffy 1979, p. VII and ff.; Davidson 1983; Elohim 1999; Dyck, Mulej et al. 1998; Ecimovic et al. 2002; Mulej et al., 2004).

We can conclude from LvB's and other writings as well as from the real life experience that a system is a mental picture of the considered object. This mental picture is made by the author / observer / manager of this object from his / her selected viewpoint/s in order to let the attributes of the object that he / she finds the most important ones, be clearly visible, exposed. Thus, the system is not really equal to the object it represents, and the model represents the system (because the system is limited to its author's mental capacity and interest compared to reality with all real (!) attributes). Due to this mental capacity, limited for natural reasons ("bounded rationality"), we humans try to control / manage / create the world although we have a very *limited insight* into its reality; to overcome this natural lack of capacity, we need *interdisciplinary creative cooperation of specialists who are mutually different and hence complementary and willing to co-operate*.

But today, systems theory disintegrates and/or develops into a number of them (see: François, 2004; Mulej, 2007; Mulej, Potocan, 2004; Mulej et al, 2006, for details; see systems science conferences for empirical data):

- (1) The ones putting system equal to object, which is OK in theoretical mathematics only, but fictitiously holistic, only, in LvB's sense, in other cases: the view is reduced to one single viewpoint / profession / scientific discipline alone;
- (2) The ones defining system as a mental picture of the object, thus admitting their own specialization, unavoidable lack of holism, but not admitting the resulting need for interdisciplinary creative cooperation hence working on complicatedness rather than complexity, inside their own specialties;
- (3) The ones defining system as a mental picture of the object, thus admitting their own specialization, too, and interested in inter-disciplinary approach;
- (4) The ones working on systems theory as a general theory of holistic thinking, decision making, and action;

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(5) The ones working on systems theory as a theory of requisitely holistic thinking and behavior in general attained by interdisciplinary creative co-operation.¹ This stream includes making an impact over humans, rather than offering them tools for them to use in whatever way and for whatever purpose.

They are all legitimate, of course, but very different. What is going on, hence²? The word system was introduced into the Systems Theory and Cybernetics in order to denote the intention to refuse one-sidedness and support holism of consideration, but with no exact and unified definition of what holism means (See e.g.: Božičnik et al, 2008; Geyer, Hornung, eds, 2003; Mulej et al., eds., 2005; Mulej, 2006; Mulej, Rebernik, Bedrač, eds., 2006, 2008; Rebernik, Mulej, eds, 2002; Rebernik, Mulej, Kroslin., eds, 2004; Rosi, Kramberger 2008; Rosi, Mulej, 2006; Trappl, ed., 1972-2010; Turina, Tintor 2003; etc.). The Bertalanffian worldwide holism requires too much breadth from specialists, especially from the ones with no or a poor training / practice in interdisciplinary creative cooperation. On the other hand, in a Webster's dictionary the word system has sixteen groups of meaning (Webster 1987). A closer look tells us that all of them have two attributes in common:

- In contents a system always represents a selection of the object's attributes from the author's selected viewpoint, and never the object as a whole.
- In the mathematical, very abstract and exact, formality a system is always a round-off entity, a whole, made of elements / components and of their mutual relations, as well as of the relations with its environment (if it is an open system).

Thus, a system is holistic, mathematically, and one-sided, in terms of its contents, at the same time. From several viewpoints, several systems, all with different selections of attributes, and hence of contents, can be introduced and let us see the same (!) object under consideration differently; therefore, we can use the same language of systems theory, but differ in content under observations, decisions, and actions.

Obviously, there is a crucial need for a system (in mathematical terms: network) of systems (in terms of their contents: requisitely holistic mental pictures) for observations, decisions, and actions to be requisitely holistic and thus requisitely reliable. But: not all kinds of systems theories provide the theoretical basis for such an orientation of systems thinking^{3,4}. DST (Mulej, since 1974) does. Hence, it may be an appropriate selection when dealing with anything, like it has been in dealing with economics, sports, organization, business analysis, innovation and creation of socio-economic and

¹ Mulej's Dialectical Systems Theory belongs in stream (5) (See: François, 2004)

² Both Cybernetics and Systems Theory originally resulted from inter-disciplinary co-operation. Not all authors have gone the same direction in later developments.

³ We must never forget that systems theory has been introduced to fight the exaggerated narrow specialization after the end of the period of two World Wars and a world wide economic crisis of 1914-1945. We must neither forget that systems thinking, as a practice of a requisitely holistic thinking has been around for ever, as an intuitive basis of success, and expressed in e.g. Yin&Yang of the Ancient China, and in dialectics, i.e. the philosophy of interdependence, of the Ancient Greeks (Delgado, Banathy 1993), as the basic ancient forms of informal systems thinking. Only a few systems theories try to cover this today.

⁴ The financial, economic, and general social crisis that has become visible in 2008 results from the failure of decisive persons and organizations to use systems theory in order to provide requisite holism rather than one-sidedness causing crucial oversights. Requisite holism of behaviour provides for requisite wholeness of insights and action, and it is based on interdisciplinary creative cooperation unavoidably. This is our experience.

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organizational preconditions for innovation, creditworthiness assessment, total quality efforts, etc.

M. Mulej was dissatisfied with authors forgetting about inter-disciplinary approach, as a way closer to the presupposed holism, in contributions about Cybernetics and the General Systems Theory (see: many proceedings of systems theory and cybernetics conferences, too many to quote here). Thus, he coined the notion of the “Dialectical System” and then the “DST” (Mulej, 1974; Mulej, 1976; Mulej, 1977; Mulej, 1979; Mulej et al., 1992; Mulej et al., 2000; Mulej, Zenko, 2004; Mulej et al., 2008; Mulej et al, forthcoming, etc.). By definition, the Dialectical System is a system (in mathematical terms) of systems (in terms of their contents), including all essential and only essential viewpoints and therefore systems featuring parts of the same object. They are mutually complementary, therefore interdependent, or in the ancient Greek word, dialectical. To make this notion workable, Mulej created the DST as a methodology of behavior, especially thinking (in observing, decision-making, and impacting) based on the following findings about reality:

- Humans think, and they do so on the basis of their *subjective starting points* (mentality, emotions, perception of the objective reality), which *can be influenced*.
- The starting points, especially the subjective ones (which select, by observation, the attributes of the objective, i.e. outer reality to be taken in account⁵), *influence all the further process* of definition of objectives and their attainment, in which many features and attributes are interdependent, rather than simply linearly dependent.
- The starting points can be influenced, too, e.g. by education and other information processes, especially the subjective ones. But the receivers of those influences tend to *react* to them *differently*, if their role is either to define objectives, or to attain objectives by partial tasks to be done.
- In acting according to their roles, humans try to be rather holistic, in order to avoid failures and the resulting troubles. But they tend to define *holism* rather *differently*.
- It is impossible for humans to be *totally holistic* on the level of LvB’s requirements. But it is an unfortunate other extreme, if one defines one’s own holism *very narrowly*, e.g. inside one single specialization, thus producing a *fictitious* holism rather than a *realistic* one; perhaps one even imagines that a realistic one has been attained, anyway (which is even worse).

SOME CONCLUSIONS

In practice, for ever, the systemic/requisitely holistic behavior has been a crucial attribute of successful persons, while the one-sided/biased/over-specialized one has resulted in failures, all way to world wars and the current danger of extinction of the contemporary civilization on the Planet Earth. Therefore, it is high time for system education to stop being exceptional and to become normal, because the informal systemic behavior is too rare to help humankind in time to create its own way out from the current blind alley. The latter was created by the recent period of the industrial paradigm in which over-specialization has been flourishing for too long; the same approach cannot solve the crucial humankind’s problems of today (Taylor, 2008). Thus, the system and cybernetics

⁵ Now, they call it constructivism (e.g. Glaserfeld, 1992, Glaserfeld, 1981, see: Steiner, in Ecimovic et al., 2002, pp. 225-241).

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movement needs support from the world-top bodies; actually, humans need it, unless our children should be condemned to live on a dying planet Earth. But both the ancient and modern fight for supremacy of either narrow specialization or the holistic/systemic thinking is not over, although it makes no sense: everybody needs a double capacity:

- A profession, which is a narrow specialization unavoidably; and
- Systemic behavior/thinking, which supports co-operation of narrow specialists on their way to the equally unavoidable requisite holism of them as mixed teams.

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