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## *Editorial*

*Journal of Teacher Education and Training (JTET)* welcomes all the readers, present and future contributors and Editorial board on the publication of first issue of this periodical.

On behalf of establishers I express a sincere gratitude to the contributors for their patience, perseverance and flexibility; to the Editorial board for wisdom, tolerance and generous support, and to the printing house *Madonas poligrāfists* for fast and qualitative printing of this edition.

Since its establishment in 1996, majority of activities performed by Faculty of Pedagogy and Psychology of Daugavpils University has been oriented to the development of teacher education and training. In 2000, faculty started its work in the project launched by the UNESCO *Reorienting Teacher Education to Address Sustainability*. The idea was advanced that one of the directions of faculty within a framework of global project could be the publication of new international journal for the dissemination and approbation of experience gained in work at university and through the international cooperation. The intention was to demonstrate the contemporary focus and proposals of problem solutions in teacher education in Daugavpils University, Latvia as well as theoretical and practical approaches to teacher education in other countries.

The main aim of issue is to create a publicity for the forum of academically and practically valuable contributions, facilitate the effectiveness of practical implementation of these contributions and purposeful collaboration of contributors. The journal targets to become an international forum for the ideas on teacher professional and academic education, in-service education, lifelong education, self-education and other issues to be explored toward the aim of sustainable development. The journal welcomes the articles reflecting the researches or projects, teacher education program evaluations, case studies, action researches, reports on teaching practice or techniques, critiques of previously published articles or books related to teacher education.

The intention of journal is to keep the structure of journal where the essentially theoretical papers would be followed by the articles integrating theory and empirical experience and at the conclusion presenting the practical methods and projects.

The first issue of JTET focuses mostly on the subject of reorientation of teacher education toward sustainable development. Editorial board for this issue includes the experts from nine countries representing the countries with different historical, economical, political and cultural background. The similar fruitful diversity can be observed also among the authors of this issue. Contributors from Latvia, representing three institutions of higher education (DU, UL and LAP) related to the teacher education and training, display a range of methodologies, theories and research methods exposing the unconfined quest for the ways toward the sustainability in teacher education. Articles from Brazil and Hungary reflect the situation in education for sustainable development in these countries describing valuable experience, which could be adopted by others. Article from Germany summarises the rich experience of author in the field of school consulting, while excellently written paper from USA pictures the model of teachers' professional development for EE, Latvian teachers have already experienced themselves. All together these articles sustain the international model of comprehension and exploration of teacher education and training toward the changes in favour of coherent future and sensible development.

As each article is supplemented by the contact information, journal kindly welcomes the readers to contact the authors in case of necessity for further information or cooperation.

Journal invites all the potential contributors to submit their articles for the next issues of JTET and wish you inspiration, perseverance and consistence on your way toward the sustainable future.

Editor-in-chief: **Anita Pipere**

# *Sustainable Education and Spirituality in the University: Looking for a Way of Complementation*

Inga Belousa

## **Abstract**

*Recent discussions about sustainable development emphasize the expansion of its initial/original field and meeting educational contexts. The paper explores current global and local expression of culture and education, the possibility of complementation of sustainable education and spirituality looking for a congruent way to introduce the issue of sustainability in education. It examines multiple understandings of spirituality and identifies a range of spirituality that conditions sustainable education.*

*The issues that are discussed in this paper are: re-orientation of education towards a sustainable development at the level of university; notion of sustainable development in education; spirituality as a necessary condition of sustainable education; multiple understandings of spirituality; and general understanding of spirituality that condition sustainable education. Research indicates that complementation of sustainable education and spirituality can provide concrete understandings of spirituality that condition re-orientation of education towards a sustainable development.*

*Key words:*

*spirituality, sustainability, sustainable development, sustainable education, traditional spirituality, strayed spirituality, natural spirituality, modernity, postmodernity.*

## **Re-orientation of education towards a sustainable development at the level of university**

The beginning of the new millennium makes universities to face huge challenges in their relationship with society. This important statement is not only a local responsibility although this article describes the situation in education in Latvia. A universal shift of ways of thinking that is particularly sensible in the last decades generates similar traits worldwide therefore it shapes a global awareness.

A concept of education from its beginning has been the ability to read, to write and to count – known as a curriculum of three R's (reading, writing, arithmetics) at the end of last century adding the fourth component – computer literacy. These practical skills, originally even not requiring the thinking and attitude of person, are not self-sufficient during the last decades. At this point we can speak about the three C's curriculum (conscience, character, compassion) (Holland, 1998) or the curriculum of four R's (richness, recursion, relations, and rigor) (Doll, 1993) that take into consideration absolutely new content and different ways to implement it.

Education in 21<sup>st</sup> century highlights two needs: transference of knowledge and skills to the next generation and marking the direction for an individual not to be

lost and to find himself or herself in immense flow of information. In other words, education should be both – a map of complicated and dynamic world and a compass helping to find the chosen way. To accomplish these objectives productively, education has to imply new philosophy based on new way of thinking. It transforms the traditional expression of education through content matters to a new one that interprets education in terms of four pillars – learning to know, learning to do, learning to be, and learning to live together. These concepts were introduced by the report to UNESCO from the International Commission on Education for the 21<sup>st</sup> century (Delors, 1996). These four ways of learning act as an integrated unity facing each other, covering each other, and interacting with each other, and for the first time, initiating the notion of sustainable education. It comes with the transformed meaning of education emphasizing the assumption that the aim of education is not just to hand on experience and achievements of humanity. Education primarily should be concerned about creating a learning environment corresponding to needs and individuality of each learner. Only then the aim of education – to make people more intelligent, informed, aware, responsible, critical, ethical, spiritual, and able of life-long learning would be accomplished. Thus, sustainable development is the most obvious characterization of education that educators are looking for. Sustainable development cannot be introduced by anything but sustainable education.

Educational issues demand a system approach, and solution of the problems requires not just practical changes, but a shift in attitudes and thinking. Sustainable development cannot exist when the attention is paid to separate details or parts. It should include a holistic approach to thinking and to life. Therefore, sustainability is the current necessity of education.

This is complicated period of time for universities in Latvia. Much should be done to reorient not only curricula, content, teaching methods and resources towards a new way of thinking and sustainable development. The issue that requires major consideration is changes of thinking on the level of the teaching staff of universities. There are different approaches – very personal ones to reach these changes. But the most effective direction is to start with re-evaluation of the understanding of a human being and of the universal world order. Besides, to be able to act differently one must perceive the world differently. This issue is clearly spiritual. The present search for new solutions is spiritual in nature.

### **Notion of sustainable development in education**

Awareness of local and global life conditions is a call for change. A change of perception, a shift of paradigms of our thinking and our values feature the new understanding of education and a new approach to educate. Many educators are aware that this understanding and approach is sustainable education. However to define the sustainable education is a complicated task.

Firstly because the concept or aim of sustainable development is not a fixed, statistical notion, but a constant process of growth and changes with interaction of social, economic, and natural systems and processes (UNESCO, 1997). It implies several ambiguities: **conditions** necessary for a sustainable life, sociopolitical **activities** to reach the goal, definite **strategies** to solve current problems (Vakerneidžels, 2000). Sustainable development is based on dynamic balance between many factors – social, cultural and economic requirements of a humankind

and a need to protect natural systems and processes; development needs and environmental requirements; economics and ecology; present moment and future; countries and continents; races and classes; sexes and ages (UNESCO, 1997). So, it can be defined as a process of changes where exploitation of resources, development of technology, and management is coherent with necessities of present time and future.

Clear and global vision how to implement the concept of sustainable development in concrete context – in education is not defined yet. Taking into consideration that sustainable development requires both – local sector (individual awareness, responsibility, actions) and global sector (politics, policies, institutions, standards) facilitation of sustainability should be introduced in both sectors. And the management of development in both sectors has to be connected with the necessity to fashion a new culture with new relationship between human beings and environment. Thus, education is a key for sustainable future, “humanity’s best hope and most effective means in the quest to achieve sustainable development” (UNESCO, 1997).

### **Spirituality – a necessary condition of sustainable education**

Any strategy of sustainable education should reveal and develop the basic values of humanity that determine not only our present life but the survival of next generations. Mistaken opinion that quantity is superior to quality still introduces false philosophy. It is one of the remains of modernity, and basic problematic issues have their origin exactly there.

Sustainable education with its aim to find a balance between people and environment requires an approach different from norm-oriented education, even from humanistic education. The only effective means for its implementation is a holistic approach. It helps to perceive everything as a whole, as one living organism that consists of many mutually interdependent parts (Miller, 1997). Spirituality in this context plays a significant role. It creates the required environment for sustainable education to happen. Spirituality is a necessary condition of sustainable education (See Fig. 1).

To facilitate the global responsibility about our times and future, to encourage people to trust in oneness and unity of the world, to foster awareness of local and global vision, and to motivate both – local and global activities for better life, sustainable education cannot rest only on its aims, needs, philosophy, and visions. There should be a personal commitment and involvement of the educator and students. And yet, personal participation is not possible with a split between beliefs and actions.

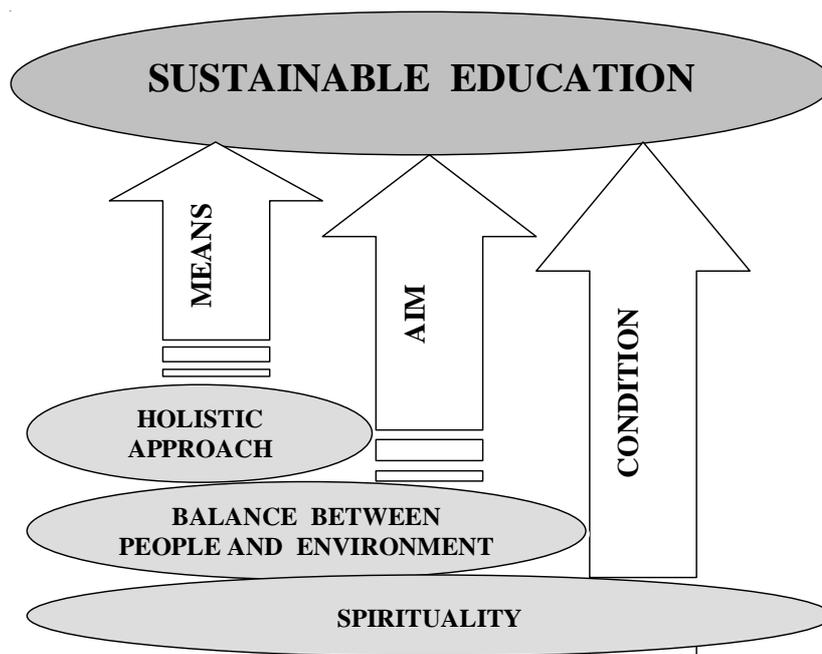


Figure 1. Definition of sustainable education

### Multiple understandings of spirituality

The shift from modernity to postmodernity has evoked a great number of vital changes. The supreme ones are those related to understanding of a human being. Many new models of the human have recently appeared. Some of them are created anew; some of them are introduced in whole or partially from other cultures or other times. A currently significant approach is to have divergent view on well-known dualistic models. One can encounter original bipartite models that have become tripartite and suggest that a human being is a complex of organism, psyche, and spirit (Helminiak, 1996). It reveals the idea that spirituality is a natural expression of a human being.

Considering global meaning of spirituality, at first, a viewpoint on spirituality and its foundations should be re-evaluated. It is more than clear that looking for a content of spirituality one cannot find it by attaching understanding of spirituality to any specific religion, denomination, state, culture, society, or politics (Küng, 1995). The foundations of the content of spirituality are based on complete self-awareness and self-actualization of a human being considering not only physical but basically spiritual expression (Уолш, 2000). In other words, spirituality in its purest form is more about a way of being than about of a set of beliefs. It is an issue of existential nature. It offers a setting for spirituality in universal terms to describe the mystical core of innate goodness within a human being.

There are as many kinds of spirituality, as there are people. And all of them promise perfection. Not to be lost in this variety a person should be aware what perfection is. In some spiritual traditions it is the development of some specific features of personality, in others – escape from the reality. Some traditions actualize *spirituality of dwelling* (Wuthnow, 1998) that requires habitation in a definite place, strict symbolic boundaries to protect the sacred space, fixed, unchanging traditions,

and a strong sense of community. Some other traditions have a *spirituality of seeking* (Wuthnow, 1998) that emphasizes a mixture of sacred and profane, a search for new sacred moments in daily life, and a pilgrimage to a spiritual ideal, to one's soul, to the true self-understanding. Having a profoundly evident contrast, these two kinds of spirituality have existed throughout history and we can encounter them today. Although both introduce the basic issues – essence of a human being, spiritual identity and development, freedom, self-expression, to mention but a few, meaning offered by each of these issues is quite different. In a society that takes the road of postmodernity, a spirituality of seeking comes out to be more effective and congruent to the philosophical visions and practical strivings of this paradigm.

Today's development of the consciousness welcomes spirituality that fosters a development of a coherent (physical, mental, and spiritual), holistic, and versatile personality striving to actualize one's own personal potential. The described characteristics can be identified as three major currents of spirituality: *traditional spirituality*, *strayed spirituality*, and *natural spirituality* (Elahi, 1999) (see Fig. 2).

Explaining these three currents professor Elahi (Elahi, 1999) introduces metacausal (celestial) and causal (terrestrial) origins. The author explains 'metacausal' as "one that transcends the law of causality, (..); 'causal' (..) as "one that abides by the law of causality" (p.21). According to it, traditional or classical or mystical spirituality is one with a metacausal origin, strayed spirituality has a causal origin, but natural spirituality – a metacausal origin with causal expression.

To find out other possibilities to define spirituality one should take into consideration that spirituality is shaped not only by personal visions but also by present social circumstances and cultural background. Researchers on spirituality in different countries offer several other definitions of spirituality. One of these models defines spirituality in six different ways (Helminiak, 1996) (see Fig.3). The first four – *spirituality as an expression of human's existence*, *spirituality as a concern for transcendence*, *spirituality as a lived reality*, and *spirituality as an academic discipline* are more traditional than the last two – *spirituality as spiritualism and as parapsychology*. The first four ways are mutually related, inclusive, and overcome the boundaries of modernistic thinking about spirituality as a private affair.

The model described above can be supplemented by another model (Elkins, 1998) that introduces alternative ways to the sacred, to the recognition of spiritual domain of a human being. These alternative ways to approach spirituality – *the feminine*, *the arts*, *the body*, *psychology*, *mythology*, *nature*, *relationships*, and *dark nights of the soul* simultaneously are the ways to the healthy and whole personality. Experience of any traditional religion, currently and in the light of postmodernism, cannot provide a holistic approach towards a human being. Therefore, the introduced ways are more alternative and inclusive than religious ones. With this the core of the model is a discernment of differences between religion and spirituality.

Spirituality in people's lives currently has rather narrow understanding – in the setting of one concrete religion or denomination that is more like a specific form of worship than a content or condition. This understanding is one of the reasons why education is not a natural setting of spirituality. Besides, a human being is not a center of traditional norm-oriented education. It means that generally spirituality with this is not an actual issue in education.

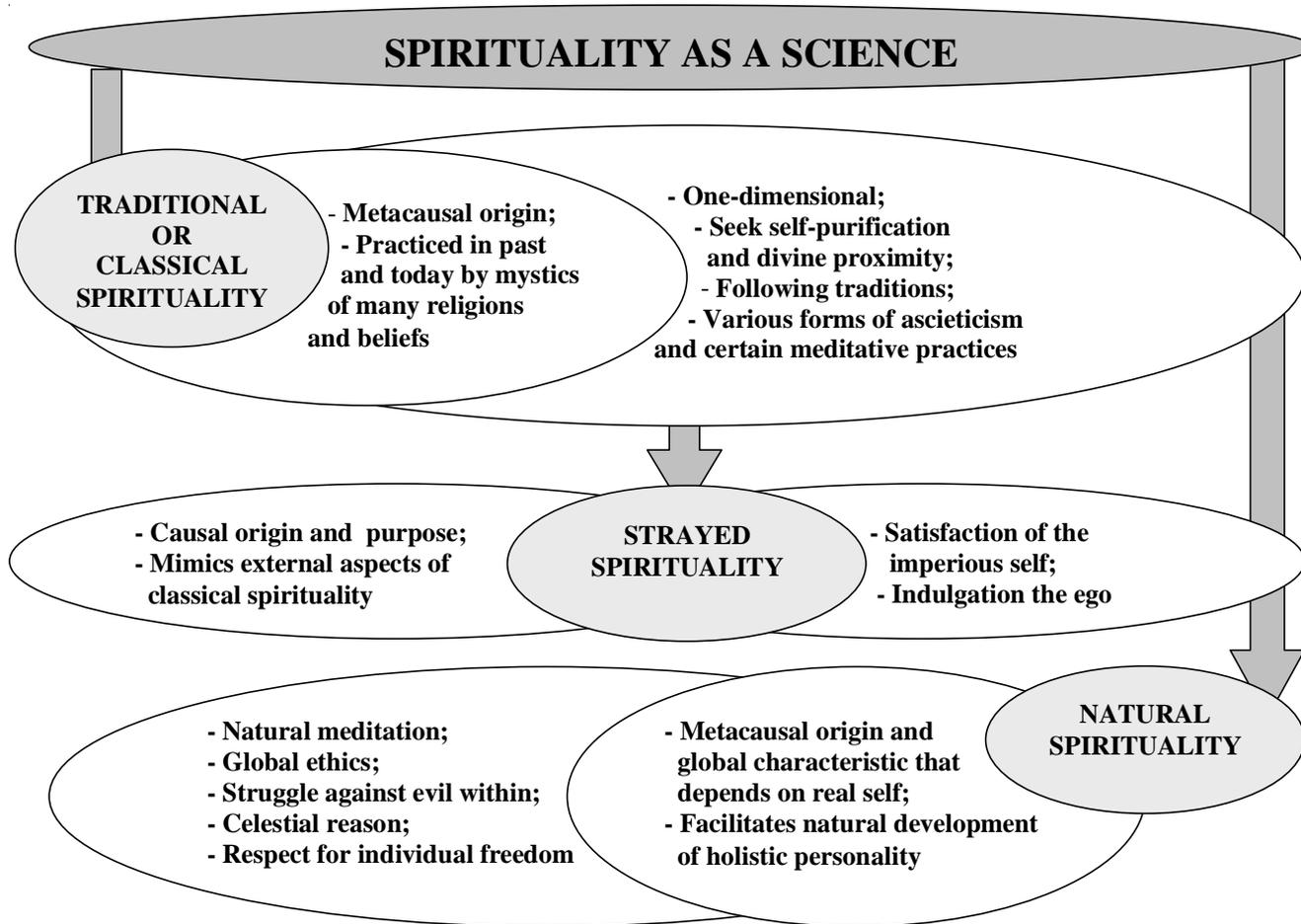


Figure 2. Spirituality as a science (by Elahi, 1999)

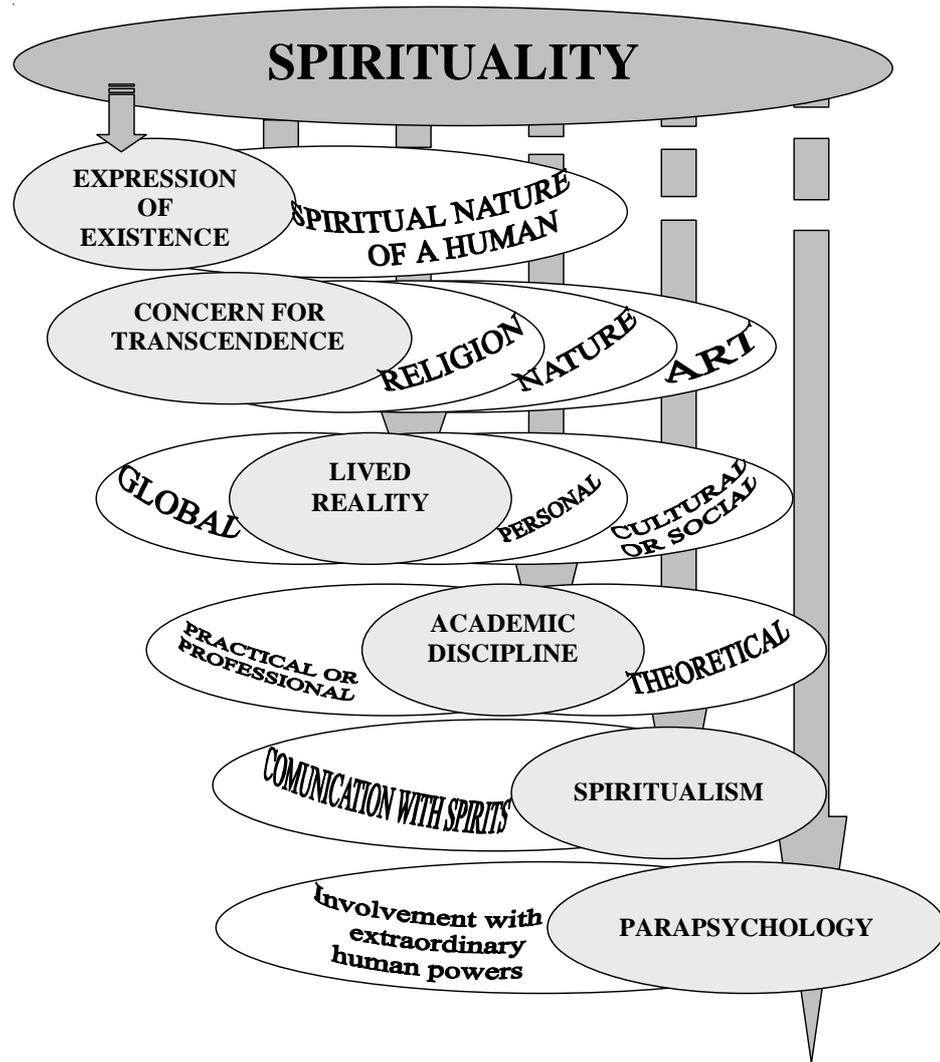


Figure 3. Understanding spirituality (by Helminiak, 1996)

Furthermore, this understanding of spirituality does not introduce the universal basis of human existence. In contrary, the narrow understanding of a human being increases duality existing in society and reposing in a gap between physical and spiritual worlds of a human being. In addition, science and intellectual capacities of a human being have developed significantly; therefore, several centuries old expression of spirituality is not satisfying anymore. Today's spirituality "must be adapted to the intellect, mentality, and level of consciousness of human being of our time" (Elahi, 1999). Therefore, – a mature, updated, inclusive and global meaning of spirituality is the one that welcomes holistic understanding and development of a human being, postmodernistic thinking, and sustainable education.

These models of spirituality are rather revolutionary. During several centuries people used separating religion from science, therefore the majority of understandings of spirituality were beyond the reach of science or rationality. These models are an attempt to explain spirituality as any other scientific discipline.

The possible way of its implementation in education starts by students' intuitive self-understanding of their inner world based on perception (body), thoughts (mind), emotions (heart, feelings), and spirit. The aim of an educator is not to lead

students to quantitative changes, but *to organize/provide a productive learning environment for development of student's abilities and discovery of their potential*. Teaching process should be a witness of the presence of quality. Professional activities guided by this aim obtain a feature of creativity and are not one-sided but more like co-creativity. They include dialogical, reflective, creative, exploratory, interactive, cooperative methods of learning, practices of openness, attentiveness to experience, and sensitivity to the world. By virtue of assumptions about nature and learning of a human being, that obviously has a scientific notion; these methods emphasize spiritual nature of a human being.

### **General understanding of spirituality that condition sustainable education**

Nowadays education, like culture and society, has lost its soul. In an educational setting there is a hunger in people for something that cannot be gained by possessing material goods. Today, educators know a lot about the mind, thinking, and memory, but nearly nothing about imagination, soul, passion and compassion in the educational process. Our students are trained to think – to question, to analyze, to argue, to criticize from kindergarten through university. Feeling is left aside and considered to be a source of annoyance. So reducing personal involvement only to include brainwork, the learning process appears to be one-sided while child-centeredness loses its holism.

Spirituality in education finds its expression through students' possibilities to know themselves and their true nature, not only with the mind but also by feelings and imagination, to be aware and to develop their own potentials given by nature, and to actualize themselves in concrete educational environments. This dualistic view of the world, nature and others gives its way to a holistic approach, integration and sustainable development.

Catechetical classes and Sunday schools provide the only possibility officially approved by the state to complement spirituality and education in Latvia. The reserved, even renunciatory attitude of parents towards catechetical classes and Sunday schools (consequently, towards spirituality) in a setting of one definite denomination in multi-religious school is in a sense reasonable, because it addresses significant issues about recognition of form, values, and sources of other religious traditions as the only truth, and with this, about the possible loss of their children's religious identity. The result of this renunciatory attitude is that the issues that are most vital and are the real content of religion and ethic classes remain in a state of neglect. These are the issues about the inner world of a human being, about the role and meaning of spirituality, about spiritual identity.

Not attaching spirituality to any concrete showground, but looking for common humanistic expressions of a person, it is possible to change the attitude of students, educators, and parents towards the actualization of spirituality at university and any other educational institute. It is possible because a global approach gives a possibility not only to create and to acknowledge their own and students' spiritual identity, but to form critical, constructive, and tolerant attitude in existing diversity of spirituality and to engage in a lifelong process of self-fulfillment. Besides, the global understanding of spirituality changes not only a worldview of a human being, but an attitude as well.

The main issue of this article is that spirituality should not be attached to any separate discipline, subject or course. It should be implemented in each curriculum as its foundations; it should be the core of a child-centered approach; it has to mark the directions of education, therefore, of the process of growth and development of each child.

Spirituality does not deal with any specific content. Its field is interdisciplinary one, involving different means from religion as well as from secular disciplines to examine the given experience. Its content is global ethics (Küng, 1995) that is based on concept of multiple experiences. Narrative and active methods, those with participation, cooperation, and not passive observation are the most effective methods to investigate spirituality. The choice of these methods helps to understand the issue of predominance of subjectivity over objectivity. Obviously, a key issue of effective methodology is the establishment of community where the basis for dialogue, reflection, and cooperation lies. Since educators really cannot teach spirituality because it is a human's state of being, spirituality can be modeled. Educators can invoke the spirituality of the learner by examples – by his/her holistic personality, by their own lived truths, by celebrating their own life and the lives of students as sacred.

The practical context for implementing this issue is within each educational environment. Nevertheless it should be kept in mind that the spiritual is not a part to be added to education. Spirituality is not a recipe to reach profane goals or even a guarantee to create a harmonious person. Rather it is an invigorating quality of the whole organism of a human being. Therefore it is not right to say that emphasizing spirituality, one can add some new aspects to and enrich education.

At best, spirituality gives a possibility to reevaluate the following: the aim of education and the aspect of motivation connected with it; the essence of education and the issue about teaching resources; the process and results of education; and spirituality's by-effects.

In conclusion, introducing a spiritual aspect into education would help both students and teachers to attain their potential and to use their sense of reality in their way in order to experience the deeper truth of existence.

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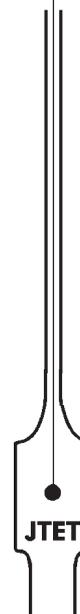
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# *Research Activity in the Context of the Teachers' Sustainable Development*

Jeļena Davidova and  
Irēna Kokina

## **Abstract**

*Characterization of the new trends in current education and emphasis on the role of the research for the development of teacher provides a background for the analysis of the methodological aspects of research within the context of teacher's sustainable development. A teacher dealing with the current pedagogical problems has to conduct the research considering the methodology of the system (S.Asmolov, K.Bolding, U.Bronfenbrenner, U.Eshby, E.Laszlo, A.Platonov, S.Schlippe), wholeness (W.Dilthey, S.Rubinshtein, G.Shzukina, T.Yacobson, L.Vygotsky) and complex (O.Babansky, S.Hessen) approaches. Teacher's research is a dynamic category and, therefore, the authors of article suggest a hierarchy of the research skills (rational and critical thinking; expedient actions; creation of the own pedagogical conceptions and models and introduction of the innovations into pedagogical practice). These skills feature the levels of teachers' research activity (thinking; pertaining to the activity; innovations).*

*Key words:*

*teacher's sustainable development, teacher's research activity, methodological principles of pedagogical research, the dynamism of the teacher's research skills, levels of the teacher's research activity, hierarchy of the teacher's research activity skills and levels.*

## **Introduction**

The objective developmental needs of modern society have determined the creation and development of educational system for the sustainable development in many countries. The processes and tendencies of the current teacher education envisages the revision of the entire education: not a single form or level of it (including higher education) can be considered a complete or final. Therefore, it is necessary to change and develop both the curricula and study courses, which will gradually respond to, but in the most optimistic scenario will anticipate and direct, the development of the democratic society and needs of people.

These demands are completely applicable to the field of teacher education, which has to be directed towards the continuous life-long learning.

## **Necessity for the teachers' research**

In the context of the transition of teachers' education to the principles of sustainable development, the importance of the teachers' research grows and the teachers become the main creators and users of information of scientific character.

In the teacher's pedagogical competence the research as one of the professional skills and the component of professional activities plays an important role, as it is related to the effectiveness and quality of education. A number of scholars have

emphasised that a scientific research is not only the activity, training for successful professional actions, but also the tool for the development of teachers individuality, self-confidence and self-actualisation.

Incorporation of scientific methodology in educational process becomes a stable tendency in modern world. So, G.Grayson and K.O'Dale, analysing the situation in the sphere of education, propose that citizens of a competitive country should have:

- high average level of functional knowledge;
- basic knowledge in the sphere of scientific methodology;
- the ability to observe the processes, to analyse them, to integrate the results and to act in accordance with them;
- knowledge about the surrounding world;
- skills of working in a team;
- ability to take responsibility;
- ability to study continuously and to adapt to the changes (Грейсон & О'Дейл, 1991).

They also emphasise the main developmental tendencies of modern society:

- consolidation of developed countries into the informational society, building the global and united informational space;
- integration of different fields of knowledge;
- growing role of ICT in the processes occurring in the society (Грейсон & О'Дейл, 1991).

Consequently, the analysis of the main tendencies in the development of higher education in Latvia enabled the authors to bring out some new tasks determined by the attitude changes toward science, culture and human being and positioned from the principles of informative paradigm. These tasks are the following:

- involvement of school teachers and university teachers in the research activities ensuring the acquisition of the academic style of thinking;
- acquisition of information science and culture as the system of gathering, processing, storing and disseminating of objective scientific information;
- tendency towards the bipolar (i.e. rational and spiritual) vision of the world based on the complementary integration of natural sciences and humanities, technocratic and environmental approaches towards the system of global human values;
- awareness of the significance of pedagogical/scientific reflection in science and pedagogical practice.

According to A.Kochetov, logic of pedagogical creativity focuses on the following features of teacher/researcher:

- analysis of achievements and failures, creation of new pedagogical ideas and conceptions in the context of pedagogical and psychological science;
- pedagogical skills;
- courage to undertake a research, ability to take a risk;
- intolerance towards the pedagogical bureaucratism, struggle with the clichés, stereotypes;
- pedagogical intuition based on the psychological vision of a child, anticipation of child's behaviour, educational measures and their impact on the child;

— aspiration towards the professional self-education, critical analysis and relevant application of the latest pedagogical experience, application of scientific procedures in one's own activities (Кочетов, 1996).

### **Methodology of pedagogical research**

Speaking about the methodology of the pedagogical research, the authors have to recognise the importance of integrated approaches in the solution of modern scientific problems: in the course of any research the perception of the processes from the positions of separate disciplines is meaningless. Only a complex perception gives an opportunity to obtain the objective results of inquiry.

Therefore, investigation skills applied through the integration of several disciplines (philosophy, aesthetics, didactics, teaching methods, psychophysiology, developmental psychology, educational psychology and others) are the main factor determining the pedagogical research.

We have to emphasise that integration does determine the simultaneous application of systems approach, complex approach and wholeness approach as the methodological foundations for current pedagogical research.

Let us describe the specific features of mentioned approaches.

Considering the **systems approach** (S.Asmolov, K.Bolding, U.Bronfenbrenner, U.Eshby, E.Laszlo, A.Platonov, S.Schlippe) as the methodological principle of educational research, the research can be conducted through the analysis of mutual ties and relationships between the components of the system and subsystems. The functioning and development of the system has to be observed. The object of the research is examined as a system, focusing on its' structural and functional ties and relationships.

**The complex approach** (O.Babansky, S.Hessen) as a methodological principle requires a pedagogical research on the components determining the pedagogical process, i.e. the aims, content, principles, forms and methods, conditions, didactics, etc.

**The wholeness approach** (W.Dilthey, S.Rubinshtein, G.Shzukina, T.Yacobson, L.Vygotsky) directs the teacher towards the investigation of integrative, invariable, sustaining ties and relationships of the system. This principle asks for the determination of both invariable and changeable, dominating and subordinated components of system. Investigation should be conducted to examine the conditions determining the best results of activities and the features of the system as wholeness corresponding to these results.

The implementation of the principles is relevant to the development of the teacher's research skills. Analysis of the results gathered in several researches (Elliot, 1991; Dunbar, 1993; Kremer-Hayon, 1993; McNiff, 1993; Clark, 1995), as well as data obtained through the observation of development of the teachers' research activities allowed us to define the **dynamics of the development of teachers' research skills** and distinguish the following skills:

- 1) implementation of the logical and critical thinking;
- 2) expedient actions;
- 3) creation of individual pedagogical conceptions and models and introduction of innovations into the professional practice.

Components of **logical and critical thinking** are reflected in Figure 1.

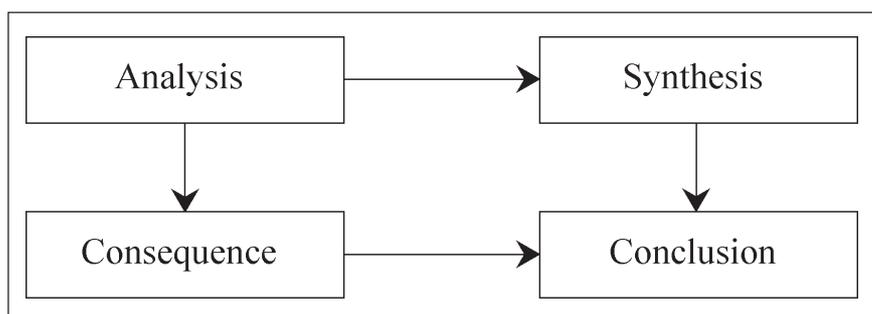


Figure 1. Structure of logical and critical thinking

The cognitive operations of comparison, correlation, generalisation, systematisation, and selection of the general and particular features accompany these actions.

**Expedient actions** mean the ability

- to evaluate the situation and to build up the hierarchy of aims (taxonomy),
- to regulate the own actions and operations according to the objectives and aim set.

**Creation of individual pedagogical theory (model) and introduction of innovations** are the highest stage of the research activity. Creatively redefining the existing assumptions on the specific educational issue the teacher designs the individual model of the solution and tests it through the professional activities introducing necessary corrections and additions. Thus, we can speak about the teacher's innovative activity indicating such individual features as

- openness of the teacher's inner world to the culture and society;
- readiness for changes;
- critical thinking;
- ability to overcome the professional stereotypes.

V.Slastenin and L.Podimova distinguish three levels of the teacher's innovative activity: the reproductive level, the heuristic level and the creative level (Сластенин & Подымова, 1995). The authors suggest that the creative level features high efficiency of innovative activities, high sensitivity to the problems as well as the creative activities.

The analysis of teachers' research skills and levels of research activities in the context of sustainable development enable us to discern the creative activity as a necessary factor for the teacher's development.

The research skills should not be perceived separately, because each of them can be considered as an essence for any other of the distinguished skills. These skills characterise three **levels of the teacher's research activity**, suggested by the authors, and they are (1) the thinking, (2) pertaining to the activity and (3) the innovative activity.

**The first level** (thinking) is characterized by the readiness for the research activity developed in the process of the teacher's professional training by means of course, diploma, bachelor and master papers as well as through the participation in academic workshops, conferences, etc. On this level, the teacher thinks rationally

and critically, carries out a mental experiment, different models, advances the hypothesis and develops the intuition.

**The second level** (pertaining to the activity) is characterised by the further development of research activity through the achievement of aims, determination of the ways of professional improvement and evaluation of practical activities. It should be stated that “the reflection as the cognition and analysis of the teacher’s self-consciousness and behaviour is an essential component of creative pedagogical activity” (Davidova, 2001). On the second level the teacher can regulate one’s own behaviour, act expediently and notice the contradictions of pedagogical process.

**The third level** (innovative activity) is characterised by the design and implementation of innovations with the aim to relieve the contradictions of pedagogical process. This goal can be achieved by free choice of the aim, contents, technology, methods and means of research.

On this level, while conducting the experiment and analysing its results the teacher makes an innovative conclusion (deduction), observes the changes in pedagogical process, changes the educational environment and overcomes the stereotypes of pedagogical activity.

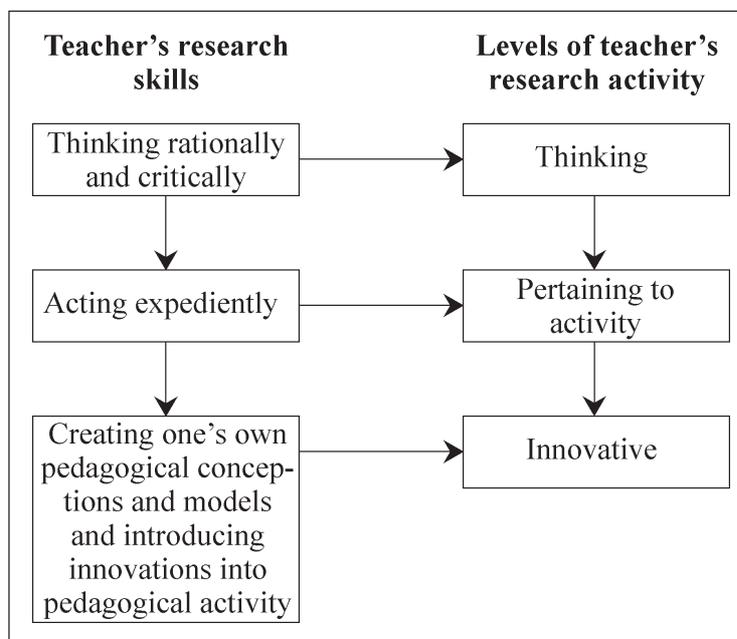


Figure 2. Skills and levels of the teacher’s research activity

The assumptions presented allow us to make the following summary:

- Main tendencies of modern society and tasks of the higher education and pedagogical science requires the teacher to master the scientific methodology, research activities and develop the scientific style of thinking;
- Dealing with the urgent pedagogical issues, the teacher has to ground the research activity on the integrated application of the systemic approach, the complex approach and the wholeness approach;
- The teacher’s research activity is a dynamic category and, therefore, it is necessary to speak about the skills and levels of research activity related to the developmental stages of teachers’ pedagogical activity.

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# *System Evaluation in the Education of Sustainable Development in Hungary*

**Gyula Lakatos**

## **Abstract**

*Nowadays teachers have a growing social responsibility. As they serve society, they are expected to make the principles of sustainable development increasingly dominant in both education and instruction. As there is a growing concern towards sustainability in Hungary, efforts for this information and processes should be reinforced and combined with teacher training and retraining programmes. There are numerous arguments for sustainable development being incorporated in school education in the future. This paper introduces the environmental curricula in the training and retraining of teachers and evaluates the education of sustainable development in Hungary. It deals with the environmental protection and ecology retraining course as a tool to implement SD at the University of Debrecen in Hungary.*

*Key words:*

*sustainable development, higher education, teacher training and retraining, environmental curricula, environmental protection and ecology, Hungary.*

## **Introduction**

Education connected to sustainable development (SD) as an integral element of several school subjects relies on a number of study fields, like teacher training and retraining, instructional programmes inside and outside schools or the media (Tilbury, 1995). The challenge of our age can obviously be regarded as the starting point of a proper and dynamic process suggesting that every teacher should be introduced to knowledge about the environment and social-economic life.

Agenda 21, the statement published in the 1992 UN conference focusing on the environment and development declares that: “education has a primary role in advancing sustainable development”. Understanding the principles of sustainable development, the interdependence of environment, economy and social systems ensures that humans may be able to use natural resources and the environment efficiently, while preserving the homeostasis of the Earth.

Today the terms of “sustainable development”, “sustainable management” and “sustainability” itself are frequently mentioned. Yet, the Hungarian use and Hungarian translation of these concepts call for an explanation. When defining sustainable development on simple grounds, it is “a way of development that is able to satisfy the demands and aspirations of the present generations by not hazarding the similar activities of the future generations” (Lakatos et al., 2001).

On the basis of this interpretation it is not the current level of economic growth that is to be preserved by the society, but material-economic prosperity that should be assured so a similar life quality might be provided to future generations, as well. The conception of sustainable development proposed by the Brundtland Commit-

tee in 1987 is “a way of development that satisfies the needs of the present without endangering the future generations in fulfilling their own demands”.

In a sustainable form of society, environmental activities and economic objectives are united and concord with each other. The discourse quoted above asserts that “sustainable development is not some perpetuated harmony. Rather, it is a dynamic and permanent change wherein the utilisation of resources, objects of investments, tendencies of technological improvement and institutional-structural systems are transformed as to constitute conformity with the demands of the present, as well as of the near future” (McKeown et al., 1999). Education and training on sustainable development represents an educational-instructional process that can lead to the emergence of a population group being sensitive to environmental problems.

The key issue in educational processes is whether a properly informed, environmentally and socially cultured group of youth has emerged. In Hungary several conferences and meetings have focused on individual and local duties, as well as on shaping the objectives and strategies of co-operation; the primary aims of these events proposed the merging the knowledge on sustainability into the curricula (Jakucs & Lakatos, 1990).

Learning, as well as teaching can be regarded as a process of a lifetime. In our changing world it can be discerned that learning is not a precondition of life, but can increasingly become one of its concomitants. To view it from a traditional aspect, the idea of “learning through life” means education outside the school system taking place after the school is finished. It can be stated that learning is actually an endless process having innumerable forms in human life, outside the school system (Hopkins, 1996).

Teacher training and retraining connected to sustainability requires an understanding of the interdependence, mutual relationship of humans and their environment. This scope of study embraces global social-geopolitical knowledge, as well as information about the ecological and human social-economic systems. Education for sustainable development trains teachers who are capable of coupling their ecological, economic and environmental knowledge with other subjects, disciplines (Csobod et al., 2001).

Issues concerning environment as a whole cover natural sciences (biology, ecology, Earth sciences), social sciences (economy, sociology, history) and human studies (philosophy, arts and ethics). Ideally, the social, economic and environmental courses of teacher training and retraining are complemented by topics on sustainability that are of interdisciplinary nature.

This paper introduces the environmental curricula in the training and retraining of teachers, gives an evaluation about the education of sustainable development in Hungary, and deals with the environmental protection and ecology retraining course as a tool to implement SD at the University of Debrecen in Hungary.

### **Outline of the curricula in the training and retraining of teachers**

Educational curricula and pedagogical approaches reflect the relationships among the scientific fields constituting the core of studies for sustainable development. The advantages of this attitude originate from the fact that sustainability can be considered as an ideal principle that responds to the encouragement of unified en-

vironmental thinking. Teaching and learning sustainability demand that educators cross the boundaries between the various branches of science, and allow an approach to any specific problems from different points of view.

Teachers generally accept that the primary aim of instruction is the transmission of some information and knowledge, while a secondary goal can be grasped in the development of abilities, such as solving problems, handling conflicts, working out consensus, managing information, using interpersonal expressiveness, as well as critical and creative thinking. Training and retraining programmes concerned with sustainability evidently contribute to the improvement of these abilities. Due to the complexity of environmental problems, systematic approaches constitute a basic requisite for the implementation of sustainable development (Palmer, 1998). The teacher's perspective should integrate and actualise the nexus among various branches of science.

The desirable "end products" are represented by widely informed teachers who are capable of realising their own respective objects, and are prepared to live with responsibility in a sustainable society (Lakatos et al., 2001). These teachers encourage students to actualise their own new ideas, and take part in activities, like voluntary public work, that constitute an educational instrument in itself. Educational programmes outside the school provide the students with the excellent opportunities for individual and group activities.

Teacher training and retraining for sustainability creates an effective means for the preparing of responsible teachers by utilising a number of instructional models and guidelines that have long been acknowledged in education. Knowledge about the existing models of sustainability can be propagated through the media and multimedia, institutions transmitting information, and by a number of other methods, both in Hungary and on international grounds.

Yet, sustainable development can be made a part of the curriculum without depriving other school subjects of time, since environmental knowledge can be handed over to students as dressed in the gown of the existing curriculum and the system of the above disciplines. Some teachers have already decided that they will apply the methods and conceptions of sustainable development, others, however, first need to acquire basic knowledge about the subject. There are numerous arguments for sustainable development being incorporated in school education in the future.

Environmental topics outline an exceptional framework for teaching the study fields of human being and nature, mathematics, grammar and literature, living foreign languages, or individual and society. Every community has its own environmental issues, and at the same time the community itself possesses the opportunity for revealing the problems.

This education comprises several principles of modern pedagogy, for example, it allows the students to make observations about the natural environment and human cultures, supports the development of a sound lifestyle, provides grounds for learning based on co-operation, and fosters the attainment of interdisciplinary knowledge.

The benefits of introducing environmental education and sustainability may be convincing to teachers. Nevertheless, teachers alone do not determine curricula. Although the National Curriculum stresses the significance of the respective common requirements, it is at fault when establishing separate periods of time for the tasks. The most probable solution for each teacher is to build the demanded infor-

mation into his/her own discipline. Yet, the small number of lessons for the given subjects makes it quite hard to achieve this end. Further difficulties originate from a major part of the subjects not having proper factual information. Despite these obstacles, a number of Hungarian schools have been able to carry through significant progress in the recent years.

One practical example is allowed admittance to the discharge and waste inventories, as well as the results of environmental auditing. These data should facilitate performing public assessments on the actual yield of state and private enterprises. When considering a general orientation, there occurs a need for comprehensive strategies to make the population social and economic partners. Regional and local authorities, as well as non-governmental bodies should be informed appropriately about the objectives and goals of EU environmental politics, the scope of responsibilities attached to the individual countries and their possible roles.

The significance of education in improving environmental consciousness should constantly be emphasised, and the idea is to become an integral part of the curriculum right from elementary to higher education. Education on environmental protection aims at highlighting the problems and possible solutions for society, and building up an organisations wherein well-informed individuals can actively take part in environmental protection and the deliberate, rational utilisation of natural resources. For arriving at these targets, the organisation of university courses, summer universities and teacher retraining programmes, as well as the publication and development of professional literature, and development of teacher aids should be started immediately.

### **Conditions for the instruction of environmental studies and sustainability in university education**

Training undergraduate experts has a key role in improving Hungary's environmental conditions and the average citizen's approach to environment. It is university education that instructs those experts who can act the most effectively for the betterment of environmental conditions, improvement of public attitude directly or indirectly as leaders and decision-makers in governmental and regional bodies, on the social-political field, as well as in private or public utilisation companies. Environmental education can be performed successfully by appropriately prepared pedagogues, consequently, the environmental training of pedagogues should be provided as a priority, and considered as a strategic issue in university education.

In Hungary conditions for instructing environmental studies in university education have been analysed by a series of national conferences. The shortcomings of environmental education in colleges and universities, as well as its strategic elements were revealed as a part of a 1992–93 comprehensive survey that covered the Hungarian conditions for environmental instruction and training in the framework of the Phare programme (financed by EC to assist the countries of central Europe in their joining the EU). These events indicate that environmental education and retraining have attracted considerable interest in the past decade, and there have been many willing to act in favour of improving the situation.

In a national perspective, the university education of teachers specialised on environmental studies seems to arrive at a solution, but the justifiable claim of providing every teacher with obligatory and – at least – basic environmental education has not been fulfilled, yet. In some colleges and universities there are undergradu-

ates majoring in “environmental protection” and “environmental studies”, respectively. The majority of universities and colleges have established specialised training forms for environmental protection.

The accreditation of specialised training and retraining courses and retraining programmes is in progress. Most of them prepare teachers for the quality realisation of the system of requirements that have been laid down in the National Curriculum. There has also been an opportunity created to attain a university certificate on environmental management in a postgraduate form.

In a considerable proportion of university institutions, particularly in teacher training colleges, methodological workshops for environmental studies have been organised, and they intend to shoulder the regular retraining of any environmental educator, either with, or without a teacher’s diploma.

Experts from university education also contribute to the work of national and regional social organisations; they ensure the steady flow of information, exchange of experiences and proper co-operation between these communities. They take part in the completion of specialised materials and educational aids for the instructional activities and training programmes, as well.

Consequently, in university education where there is a tendency of reinforcing environmental and conservation approaches, the attitude of teachers has shifted towards a gradual transformation. Yet, in spite of this welcome process, university education has still borne several problems, some of them having a strategic significance.

A considerable number of teachers in public education are not capable of instructing integrated environmental studies using the desirable standards. University students, the teachers of the future, will only be able to fulfil their duty if they are prepared for the challenge.

Recommendations for the improvement of university education on environmental studies and sustainability include:

- Prospectively, every graduate should attend an environmental education course. The modernisation of university education, the advancement of co-operation among the institutions will certainly allow the implementation of this branch of instruction through interdepartmental education and specialised training.
- During their university studies, every graduating teacher should receive theoretical and practical training on the value system and approaches related to environmentally conscious behaviour.
- Regarding the objectives mentioned above, every department that trains teachers and lacks subjects serving specialised environmental education should introduce basic environmental instruction as a separate discipline.
- An environmental retraining system should be framed for every professional branch of teacher training in university education. In the current situation it would be serviceable to present the system of requirements, as well as the applicable methodology for environmental education and instruction to university teachers from varied aspects.
- Fortunately, the spectrum of methods used in environmental education become gradually more colourful; this broadening stock of methodological devices should also be included in the curricula of postgraduate training in university education.

- Retraining courses of environmental education should be open for any environmental expert without a teacher's diploma.
- All systems of adult training should promote the preparation and reinforcement of an environmentally conscious mode of life. To forward this aim, it would be beneficial to work out a so-called environmental curriculum unit in order to fill the need for environmental attitudes. This unit should be regarded as the core material for all (informative) forms of adult education.

### **Specialised retraining on environmental protection and ecology at the University of Debrecen**

At the University of Debrecen postgraduate instruction on agro-ecology was originated in 1988 with the co-ordination of the Department of Ecology. According to the decision of the University Board, financial resources to support the training programme could not be raised; consequently agro-ecological education had to rely on the university fees paid by the students. It was 1991 when the first university class passed the state examination and a number of the graduate students have succeeded in earning various, higher university degrees, as well as being assigned to responsible posts in environmental protection.

Due to the subsequent political, social and economic transformation of Hungary, the above agro-ecological training organised by two distinct universities has had to be unfortunately omitted for the past few years. In the meantime there has occurred an intention to replace the primarily agricultural-environmental profile by a retraining form of an ever-broader professional instruction, therefore an environmental-ecological professional orientation has been suggested. The educational objectives of agro-ecological training have also been actualised and developed. When assembling the training material, the spirit and principles, as well as prescriptions and ordinances of the "1995/LIII. Act on the General Rules of Environmental Protection" passed by the Hungarian Parliament on May 30 1995 have been eminently considered and incorporated into the curriculum.

Chapter 2 of the Act exclusively discusses issues connected to the protection of environmental components and factors endangering these elements. Adopting the spirit of the Act, a National Programme on Environmental Protection has been elaborated on as a core material in consideration of sustainable development and the protection of certain environmental elements, such as soil, water, air, biosphere and constructed environment.

The environmental-ecological retraining programme at the University of Debrecen shoulders the ecological state assessment of environmental elements and graduate teacher instruction for the conservation, preservation and protection of the natural environment, as corresponding to the economic requirements of the age. Today it is the ecological-minded, organism-centred principles that have come into prominence. The harmonious co-existence of human being, society and the natural environment, as well as living according to the attitude and consciousness represented by the ideas of sustainable development has become pressing imperatives.

The target of the training is: the retraining of teachers of biology and environmental studies, as well as of other experts graduated as teachers, which will enable them to participate in the modern instruction of basic and applied scientific knowledge on environmental protection and to perform high-quality professional work in the practice of environmental protection (as commissioners of environmental protection, referees etc.)

A course of the retraining programme is entitled Sustainable Development and includes the following topics for the discussion and investigation:

- Energetic, economic and environmental problems that originate from population growth: phenomena endangering the ecological potential of the Earth.
- Relations between economic and ecological systems.
- Issues on power production and implied solutions for the problems. Traditional and alternative energy sources and their environmental impacts. The present and future role of nuclear power plants. Risks connected to nuclear power plants.
- The exhaustion of raw material bases and natural resources. The reduction of the energy and raw material demand of products and production. The application of environmentally friendly and recycling technologies.
- The transformation of agriculture. Eco-management.
- The preservation of forested areas. Biological plant protection. The reduction and elimination of biological invasions, infections.
- The transformation of water reserves, new strategies for water management.
- Sustainable human settlements.
- The significance of preserving biodiversity.
- Important methodological ideas for the education of sustainable development.

### Conclusions

Understanding the principles of sustainable development, the interdependence of environment, economy and social systems ensures that humans may be able to use natural resources and the environment efficiently, yet as preserving the homeostasis of the Earth.

There is a growing concern towards sustainability in Hungary; the efforts for this information and processes are being combined with teacher training and retraining programmes and should be reinforced. Issues concerning environment should be seen as a whole covering natural sciences (biology, ecology, earth sciences), social sciences (economy, sociology, history) and human studies (philosophy, arts and ethics).

Teaching and learning sustainability demands the cross-disciplinary approach and allows to deal with any specific problem from different points of view.

Teacher training and retraining on sustainability creates effective means of raising responsible teachers, as well as utilising a number of instructional models and guidelines that have long been acknowledged in education. Education about environmental protection aims at highlighting the problems and possible solutions for society, and building up a construction wherein well-informed individuals can actively take part in environmental protection and the deliberate, rational utilisation of natural resources.

From a national perspective, the university education of teachers specialising in environmental studies seems to arrive at a solution, but the justifiable claim of providing every teacher with obligatory and basic environmental education has not been fulfilled. The accreditation of specialised training and retraining courses and retraining programmes is in progress.

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# *Critical Communicative Model of Teaching the Native Language*

Diana Laiveniece

## **Abstract**

*The article deals with a critical model of teaching/learning the native language, the model that could serve as a basis for organizing the teaching/learning process. The model focuses on the relationships between the learner and the pedagogue as the subjects of activity towards the object, i.e. towards the school subject to be studied together. Interaction of this triad is organized through specifically adjusted approaches. The learner's and the teacher's mutual activity is based on a humanistic approach to personality. The teacher's attitude to the native language as a school subject and subject he/she teaches is founded on the linguistic communicative approach. The learner's cognitive attitude to the subject is founded on the critical approach. The series of other structures and characterization of their components arise from this model.*

*Key words:*

*model of native language teaching/learning process, linguistic-communicative approach, critical approach, humanistic approach, language and communicative competence.*

## **Introduction: substantiation of the problem**

Along with the necessity to change the attitude of society in Latvia towards the role of education in a person's development a need for revising goals, objectives and content of specific school subjects has arisen. This need naturally leads to restructuring the whole educational system or at least to its improvement. The Latvian language should occupy a special place in a person's development and education in Latvia, because, first of all, the native language is a means of an educated and mature person's reasoning, self-expression, mode of thinking, comprehension and reflection of interrelations between the world and people. Only then can the language be perceived as the means of communication, getting information, developing, disseminating and learning the culture (Kļaviņa, 1997). This statement is supported by the idea of W.Humboldt: "The essence of the language lies in its task to modify the matter of the outer world in a form of reasoning, to reflect and cognize", in contrast with the view of J.Stalin: "Language is a means, an instrument helping people communicate, exchange their opinions" (Kļaviņa, 1998). The latter statement, in fact, equals reasoning and language, thus turning the language into a dogma. Respecting the opinion of L.Vygotsky we would like to prove that the native language and reasoning are holistic entities: "Speech cannot be put on a dogma like a piece of ready-made clothing. Speech is not a manifestation of a finished thought. A thought, transforming into speech, restructures and changes itself. Thought is not expressed in words, thought materializes in a word" (Выготский, 1982). To work towards such comprehension of the relationships between the native language and thinking

as early as in primary school, an appropriate didactic model how to organize teaching of the native language should be created. In this model the functioning of each component and interaction between all elements would promote the development of the strategic aim of learning the native language. **That aim is to perfect the learner's skill at expressing himself/herself and communicating in the native language, at becoming aware of its role in self-improvement, at maintaining one's national identity and studying the culture of the given country** (Standarts: projekts, 2001). There exists a space for activity between setting the goal, designing the model and reaching the result. This space is filled in by the teacher, first, by understanding the model (in general and in details), by critically evaluating and accepting it as feasibly significant, second, by setting criteria and verifying them in practice (following all the parameters of the model as closely as possible) and third, by approving or disapproving the model (depending on advancement of practical activity and level of the realization of the selected criteria) (see Fig. 1).

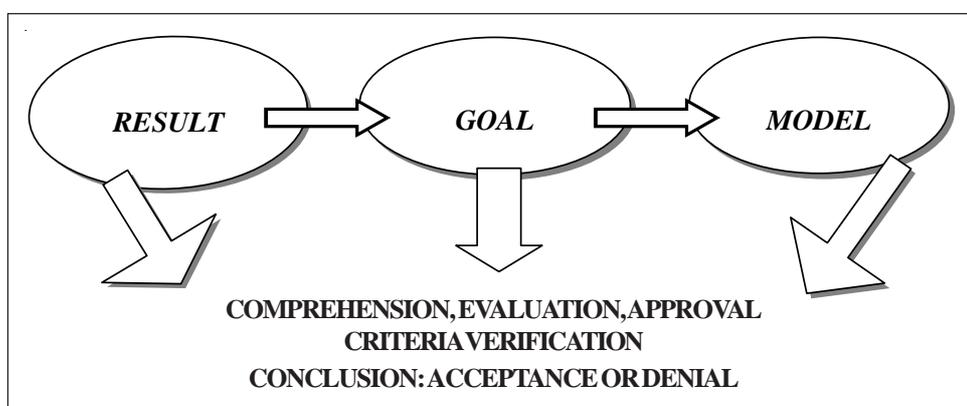


Figure 1. Application of the model in teaching/learning process

### Characterization of the situation

The system of teaching Latvian as the native language during at least the last fifty years can most precisely be characterized by words of P. Freire, the representative of radical education: "Teachers presume that their task is to "fill up" their students with their narrative. .... Learners turn into a kind of a vessel that the teacher has to fill with knowledge. They are supposed to build up their knowledge in a passive way and store it in their brain depository like in a bank" (Miezīte, 1990). Today a learner can no longer comply with such a role of being an object. Therefore, we receive the logical outcome: pupils view the learning of native language as a hard, tiresome, even senseless and unnecessary activity. The reason for this might be the incomplete implementation of two motivating factors in the course of the instruction process:

1. Significance of language in the process of reasoning, conveyance and perception of ideas is relatively little emphasized and tested in practice. Language inability, insufficient vocabulary and means of expression hinder expressing the thought (inner disturbing factor). It could not be expressed (by speaker or writer) and comprehended (by listener or reader) in a way it was conveyed – the limited knowledge of language hinders transference of thought (external disturbing factor). L. Vygotsky has picturesquely, though, precisely

compared reasoning with a massive thundercloud that empties itself with the help of a shower of words (Выготский, 1982).

2. Learners are given no opportunity to use acquired knowledge in the learning process, test its usefulness, and evaluate the adequacy of particular tools of language matching the specific communication situation, aim, addressee and other factors of communication. One of the major didactic principles has been disregarded in native language teaching/learning process – the linkage between the learning process and real life (resulting from G.Kerschensteiner and H.Gaudig's shared views) (Štāls, 1931; Gaudigs, 1922).

Feasible links between the language and thinking (1) and teaching/ learning and life (2) in the course of learning the native language are only natural, they are self-evident, regular, absolutely necessary as a means of strengthening learning motivation. In learning a foreign language these functional relationships produce a different structure. Boundaries between teaching/learning the native language and real life, in this case – between commonly used “alive” Latvian and the fields of its application – creates an artificial model of learning a language. In the current situation, when the quality of communication is one of the most relevant indicators of an educated person's competence, it is a limiting factor. Our contemporary society needs an educated person with an aptitude to think independently and be flexible, to make decisions, to act and to take responsibility, a person who is rooted in the cultural values of his/her people and is tolerant of ethnical values of others (Standarts: projekts, 2001). To make feasible the development, growth and socialization of such kind of person during the process of teaching/learning the native language, the language and thinking should be treated as closely related. Unfortunately, recently opinion that language is only a means of communication is widely distributed in Latvia. The reason for this can be found in the growing intensity of learning Latvian (LAT2) and foreign languages as second languages, their primary aim truly being teaching language as a means of communication. However, this tendency has been generalized (Paegle, 2000).

### **The goal of designing the critical communicative model**

In order to enable the teaching/learning of the native language as a general subject, the teacher of the Latvian language must become a facilitator of the student's versatile development. This will create a decent performance of their mission, i.e. to foster the development of a linguistically competent personality

- who would be perfectly aware of his/her language proficiency,
- who would develop awareness of the language as a type of existence and as an integral part of self-image,
- who would have a good knowledge of the specific character of the means of language and would be able to match them to the communicative situation (Laiveniece, 2000).

The previous system of learning the Latvian language should be radically transformed. The critical communicative model of learning the native language is offered as one of the ways for the solution of this problem (see Fig. 2 and Table 1).

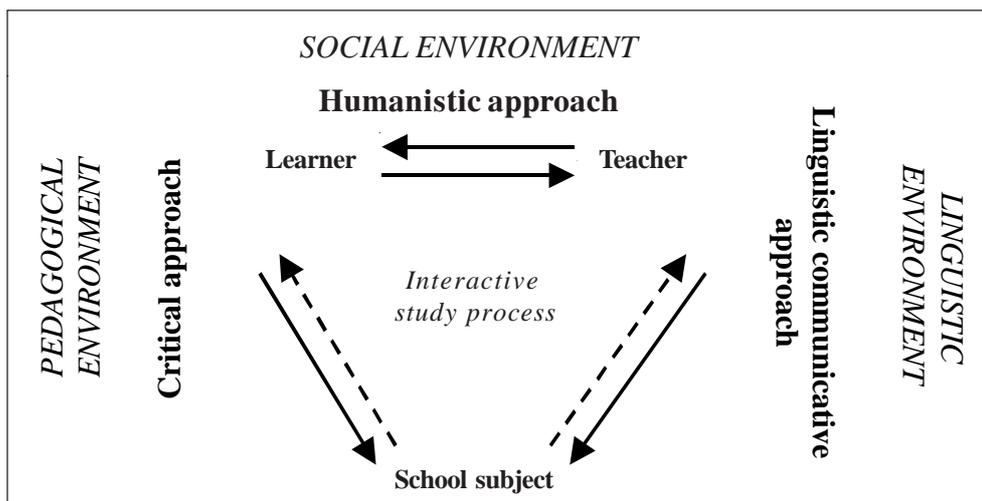


Figure 2. Components of critical communicative model

Table 1. Bilateral relationships of critical communicative model

$L \rightleftarrows T$	$L \rightarrow S$	$T \rightarrow S$
<b>Humanistic approach</b>	<b>Critical approach</b>	<b>Linguistic communicative approach</b>
<ul style="list-style-type: none"> <li>· Co-operation</li> <li>· Confidence</li> <li>· Personal interest</li> </ul>	<ul style="list-style-type: none"> <li>· Interest</li> <li>· Motives</li> <li>· Critical attitude</li> <li>· Creativity</li> <li>· Purposefulness</li> </ul>	<ul style="list-style-type: none"> <li>· Professionalism</li> <li>· Systemic</li> <li>· Scientific character</li> <li>· Purposefulness</li> </ul>

Through the correlation of three approaches this model suggests a possibility of implementing an interactive teaching/learning process and its application in creative, critical and purposeful teaching/learning of the native language.

### Nature of the model

When engaging in the model, the main emphasis is put on equally active and concerned co-operation of learner and teacher as the subject of the activity with the object, i.e. the given discipline during the study process (the cognition process). This is not only the deterministic approach to interrelations and activity between the subjects – humanistic approach, but it also starts a line leading to understanding an educational concept, presented by the German educationist W.Klafki in his critical constructive didactic theory. He suggests that the basis of education is constituted by unity of three abilities – self-determination, co-determination and co-operation (*Selbstbestimmungsfähigkeit, Mitbestimmungsfähigkeit, Solidaritätsfähigkeit*), leaving the quality of their implementation and consequences as a responsibility of each individual (Klafki, 1999).

The novelty of the model can be found in the choice of two different, yet mutually connected and dependent approaches, aimed at determining the relationships between the subjects (learner and teacher) and the object (native language as

a school subject). In the teaching/learning process the teacher pursues the linguistic-communicative approach, simultaneously fostering the learner's critical attitude to the acquired knowledge. The unity of these two approaches needs a more detailed explanation. There exists the correlation between the teacher's linguistic-communicative approach to the school subject and the learner's critical approach to the subject, i.e. through cause and effect relationships, which creates qualitatively new relationships. The learning/teaching material offered by the teacher, independently chosen by the student, or selected in mutual collaboration become the learner's intellectual property. The condition is that following a critical, substantiated way of perceiving, comprehending and learning, the learner develops awareness of the personal significance and necessity for this kind of material. The task of the teacher, in turn, is not only to offer specific material, relying on the learner's value-orientation, which might be impulsive and situational. In a professional and effective way the teacher has to show the significance of the assignment. The teacher gives a chance to verify the materials in purposeful activities, namely, assigning the tasks to encourage interpersonal communication, asking for deliberate statements to express thoughts, ideas, plans, fantasies in various formats of communication (monologue, dialogue, and polylogue) and different forms (oral and written). Effectively modeling communication situations teacher provides the learner a sufficiently wide context for activities to test and accept the usefulness of the knowledge to be acquired.

Through this aspect of dynamism the significance of the teacher's role manifests itself most vividly, so that the progress achieved would be long lasting and far-reaching. It is aimed not at satisfaction of the present needs (for example, to successfully pass the examination), but at critical, creative and free interpretation of knowledge in further activities and for further needs. Actually, this is the primary criterion, which serves as a basis for practical judgement of adequacy or discrepancy of the created model for the established goal.

On the background of the author's research critical communicative model was designed (see Figure 3). The scheme of this model contains one more correlation, i.e. unity of the social environment (area of the relationships), educational environment and the linguistic environment, which as a complex microenvironment enhances the development of a student through the native language as a school subject.

### **Components of the model: interpretation of concepts in the present research**

The content of the native language, its process and organization are determined by synthesis of three branches of science – linguistics, psychology and didactics, which form the conceptual structure of this model.

- Linguistics determines the subject content of the native language, its new aspects, principles of selection, organization, and presentation of teaching/learning materials – **linguistic component of the model.**
- Psychology indicates the learner's individual peculiarities to be respected, in this case, dynamics of students' emotional and cognitive development, as well as the level of their learning capacity – **psychological component of the model.**

- The system of didactic categories (it can be correlatively linked with linguistic-didactic categories) determines the approaches to the teaching of subject, the didactic principles to be respected providing study aids, structuring the study process, and defining teaching/learning goals and corresponding objectives – **didactic component of the model**.

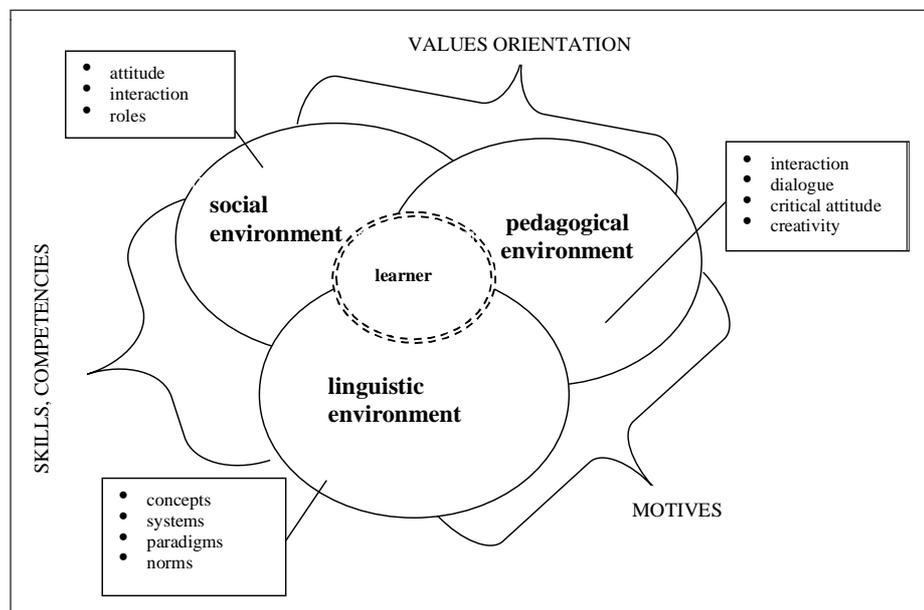


Figure 3. Critical communicative model: interaction between the environments

Each component of the model has a practical implementation based on the specific approach. By ‘approach’ in pedagogy we understand **attitude, manner of behavior** (our interpretation of humanistic approach) (LLVV6<sub>2</sub>, 1987); **the way, the manner of tackling the basic approach to the problem** (Pedagoģijas termini, 2000) (our definition of the nature of linguistic-communicative approach); as well as a **general practical position adopted by the learner towards the school subject** (our definition of the nature of critical approach).

By the concept of **humanistic approach** we understand mutual feedback between the teacher and the learner as a characteristic feature of communication between people, manner of their behavior, rooted in the ideas and principles of humanism:

- Pedagogical process is learner-centered,
- Any subject of the pedagogical process is unique and is a value in itself,
- Making choices in their lives people choose their fate with a deliberate effort of free will,
- The learner’s self-evaluation is determined by the love and support of the peers,
- Self-acceptance is a key to developing empathic and tolerant attitude to other people,
- Foundation of human nature is a trend to self-actualization.

By the **approach to the native language teaching/learning** we understand the purposefully chosen and theoretically substantiated approach to the sub-

ject in terms of the content and process, which is included in the standard (Standarts: projekts, 2001), programs (Programma: projekts, 2001), and teaching aids. This approach is consistently respected by the teacher at all stages of pedagogical activity (in lesson, its organizational stage, designing teaching aids, planning different educational situations etc.). From the learner's point of view, this approach manifests itself as the attitude to the subject and teaching/learning process. This is a form of acquisition of assigned and freely chosen teaching/learning material most vividly actualized through the variety of communication situations (through a dialogue with oneself, with the teacher, other students) and problem-based teaching/learning.

To formulate the concept of 'critical approach' we will refer to the critical didactic theory of German educationist R. Winkel (1999) and critical constructive didactic theory of W. Klafki (1999). **Critical approach** to learning the native language is a learner's conscious approach to the school subject in the unity of its content and learning process characterized by:

- Stimulation of the ability of self-determination and co-operation;
- Orientation of practical activity towards critical attitude, creativity and innovation;
- Interaction aimed at independent activity;
- The learner's participation in planning a discursive teaching/learning process;
- Identification of the destructive factors in teaching/learning (also in communication) and their timely neutralization.

**Linguistic-communicative** approach is a recently developed synthetic approach to teaching/learning the native language, which envisages the developing comprehension of the regularities, concepts and the system of the language in their mutual interaction and balance, on the one hand, and development of the language as a form of reasoning, expression of thoughts and as a means of communication in the variety of communicative situations, complying with the norms of literary standard, on the other hand.

To characterize the linguistic – communicative approach we will use interconnections of two categories – competencies and the language skills. According to J. Adair's theory, language skills – speaking, listening, writing, reading – are types of communication (Edeirs, 1999). The concept 'competence' is "integral, it develops, and its contents has not been generally accepted as yet,... [it] is linked with such words as qualification, level of education, knowledge, experience, ability(ies), learning capacity, readiness and will. .. Different aspects of the concept competence have a different meaning in various situations. Competence manifests itself through action, when carrying out an assignment" (Valbis, 1997). The dictionary of pedagogical terms explains the concept of competence as the necessary knowledge, professional experience, and comprehension in a certain area, matter and the skill at using the knowledge and experience in a certain activity (Pedagoģijas termini, 2000). The standard of the native language describes the concept 'competence' as the knowledge, experience, values, attitudes, which the learner develops in the teaching/learning process and which manifest themselves as the skills and the ability to express oneself and to communicate in the native language (Standarts: projekts, 2001). The latter of the two formulations successfully describes the above-mentioned interconnection between competencies and language skills.

The four language skills – listening, speaking, reading, and writing – and two major competencies – the language competence and the communicative competence, form the core of the linguistic-communicative approach. In the process of learning the native language several other competencies can be developed: *socio-cultural competence* (function of transference and inheritance of cultural traditions), *learning competence* (ability to acquire and use efficient and rational techniques of mental work according to the individual peculiarities of perception and learning style), as well as *social competence* (wish to collaborate and communicate with others during the learning process, empathic attitude to peers, at the same time retaining his/her self-respect and confidence).

In the context of the communicative approach (it is dealt with as an approach both in learning foreign language and as an approach to language in general) these competencies (there exist several more – insignificant for learning the native language) are not treated as two distinct categories. They have hierarchical structure: the top of this structure is communicative competence, formed by several components or subcompetencies (Hymes, 1972; van Ek, 1986; Педагогическое речеведение, 1998). The above mentioned investigations suggest the definition of communicative competence as a complex system with several levels, with the language competence as one of the competencies. This interpretation follows from the assumption that the primary function of language is communication. With the linguistic-communicative approach chosen for teaching the native language, both communicative and language competence should be considered as equally important, however, we can not deny that without the high language proficiency communicative competence can not reach its full value. The English sociolinguist R. Bell claims that communicative competence is formed on the basis of language competence (Bell, 1980) indicating hierarchic links between them. This condition permits the inclusion of both competencies in the title of this approach. At the beginning of this article, language was advanced as a means of a person's reasoning and self-expression, the primary function in the native language teaching/learning process. Therefore, in our approaches we cannot limit ourselves to the perception of language only as the tool for communication.

In 50s-60s N.Chomsky introduced the notion of language competence. Investigating the speaker's understanding of an unlimited number of sentences, he designed the concept of linguistic competence. Language competence is based on the speaker's knowledge of the language system supporting the skills of creating and understanding grammatically correct sentences. This is not a homogeneous competence either and it can be structured into smaller units. For example, L.Bachman splits the language competence into two subcompetencies: organizational subcompetence (i.e. grammatical competence and textual competence) and pragmatic competence (i.e. illocutive (situational) and socio-linguistic competence) (Bachman, 1990).

It is necessary to emphasize the following elements of proposed critical communicative model in relation to the competencies of the native language (Latvian):

- Knowledge of the language system, its levels, functions;
- Perfect knowledge of the norms of the standard Latvian language;
- Knowledge of the possible use of each item of the language to express one's own thoughts and convey them to others.

The author of the communicative competence is the sociolinguist D.Hymes from the United States. During an in-depth study of N.Chomsky's research in the 1970s, he declared that language proficiency means not only the knowledge of grammar rules, but also a skill at understanding and using the language to match the communication situation. According to D. Hymes "the child learns sentences not only as grammatical units, but also as units of speech which correspond to a certain context in which they arise. Thus the child becomes not only linguistically, but also communicatively competent" (Kramiņa, 1999). R.Bell expresses the nature of communicative competence in a form of question: "In what way can the speaker operate with the elements of language and social skills to be able to perform speech activity according to the regulations he should comply with?" (Белл, 1980).

We would include the following elements into the framework of the critical communicative model of teaching/learning the native language (Latvian) to characterize the nature of the communicative competence:

- Unity of interaction (also co-operation) and communication, its structure, determining factors, types, culture;
- Critical selection of language means and their use depending on the specific features of the communication situation and the goals of communication;
- Informed skill at using the knowledge of standard language in communication;
- The ability to assess the conformity of the language use with the norms of standard Latvian.

The reason for such specifications of feasible connections of competencies referring to the critical communicative model is the novelty of the concept 'linguistic-communicative approach to teaching the native language'. The intention is to prove the differences between the linguistic-communicative approach and the communicative approach regarding the very nature of these approaches. One must also choose the goal and distinguish between teaching/learning native language and foreign language (including also teaching/learning Latvian as a second language (LAT 2)).

## Conclusion

This paper has presented an elaboration and adaptation of "critical communicative model" of teaching the native language in basic school. It is one of the first attempts to structure the system of didactic components in the process of teaching/learning the native language, constructing it as the part of the didactic model. Up to now, the didactic structure of teaching the native language has been paid less attention than subject content and methodology. The critical communicative model is one of the opportunities to combine in a holistic way the elements of content and the methodology of teaching/learning process of the native language as a school subject.

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# *Respecting Students' Needs in Educational Environment*

Eridiāna Oļehnoviča

## **Abstract**

*The paper analyses two main tendencies in didactic theories regarding the organisation of educational environment. These tendencies can be labelled as the educational environment alienated from persons and educational environment centred on persons. Study process in higher education has its own logic. This logic requires the links between the process and the awareness about the students' needs on two hierarchical levels: the level of the educational system and the level of students/teacher educators.*

*In the process of organisation of educational environment it is very important to co-operate with students in order to get a high-quality feedback, to give the students an opportunity for an active engagement in the planning of their own study process, to look for the best solutions, and to make the process of studies personally important and meaningful to them. Practical recommendations are given to teacher educators about more efficient organisation of the educational environment.*

*Key words:*

*educational environment, educational environment alienated from persons, educational environment centred on persons, students' needs.*

## **Introduction**

The beginning of the 21st century in pedagogy is marked with the pluralism of didactic theories, where the features of syncretism (an eclectic succession of different contraversial, incompatible opinions) can often be found. The learning theories cannot ignore the influence of globalization and development of informational technologies. This process includes positive changes, nevertheless, it often leads to the evening-out of the traditions of national education and to the detachment from cultural and historical heritage.

The ways to improve the quality of education have been sought; the future educational system is associated with the continuous process of changes, with the teacher's role to carry and implement these changes (Fulans, 1997). The change of pedagogical paradigm and the transition of the entire teacher training system to the development of student's learning and independence has been proclaimed. It is rather easy to model this process on the level of abstraction, but the real educational environment in the specific institution of higher education usually is too complicated to be comprehended instantly.

**The aim** of this paper is to analyse the features of educational environment from the point of view of different theories focusing on the awareness about the students' needs in university teachers, students and entire system of education.

### **Didactic theories on the features of educational environment**

The analysis of didactic theories and concepts will be centred on the authenticity of respect for students' needs in the educational environment.

Two main tendencies can be observed in the didactic theories regarding the choice of subject content, organisation of educational environment and dominating style of mutual relationships. These tendencies can be labelled as the educational environment alienated from person and educational environment centred on person (Гусинский & Турчанинова, 2000).

Many authors associate the tendency toward the educational environment alienated from persons with the term "traditional academic educational environment", which can be described by such categories as structuring, teacher's authority and status, control, discipline, mental abilities, memory training, and, most importantly, the courses. In this environment the students acquire the basics of science and "science" in this context means the objective and authoritative code of rational laws, and the operations processed by the familiar algorithms. "Scientific" truth here is quite often perceived as the constant and definite phenomenon. The aim of such education is the mastering of curriculum based on memorisation rather than thinking, since there is a correct and an incorrect answer to any question, as well as on common tasks, so that students would learn as many as possible correct answers to the questions considered important by teachers. Interacting with the students, the teacher tries to keep a definite distance: he or she is a kind of a guide having all the right answers for each question. The ways of expression of student self-activity are definitely regimented within a traditional educational environment.

In this way it is impossible to perceive a certain science as an integrated, coherent system of concepts, based not only on rational thinking, but also on emotions and metaphorical perception. Students have to remember some statements and definitions, the deeper meaning of that quite often remains obscure to them. Still teachers misinterpret this ability of reduction as a high academical level. This phenomena is confirmed by a frequent observation: students often have serious difficulties formulating their own personal point of view if they are asked to interpret any issue both, in scientific language and using simple, informal words.

It is also necessary to acknowledge that in this educational environment the great deal of interactional situations (lecture-room arrangement, timetable, content of studies, knowledge and skills assessment forms) is strictly regulated.

The general feature of traditional academic educational environment as the environment alienated from persons is a hierarchical subordination where the students' social, self-esteem (recognition) and self-actualization needs are not a priority for educators.

The educational environment centred on the person can be associated with the alternative pedagogy deeply rooted in philosophical theories of existentialism, experimentalism, pragmatism (J. Dewey), humanistic psychology (C. Rogers, A. Maslow), and ideology of postmodernism (J.F.Lyotard, M.Foucault, J.Habermas, W.Welsch). Such an environment gives rise to the phenomena of self-identification, self-assertion and self-actualisation and helps to achieve the individual aims in the process of studies. The following concepts are emphasised in this context: growth and development, freedom, integrity, student's needs, activity, interest, coherence of social and emotional needs, and higher educational establishment as a community.

The study process can not be conceived without empathy, humanistic relationships and authentic behaviour, when the teacher can expose his/her real *Self*, accepting the students as they are, and carrying on a dialogue between parties endowed with the equal rights. Teacher should reconcile the thought that a fast and complete understanding is not always possible to achieve, since it is necessary to co-ordinate the points of view and not to press the students for an answer.

Analysis of the problem of teachers pre-service education proposes the assumption that the teacher educators must work on two levels of curriculum – not only on the level of content, but also on the level of meta-studies (Salīte, 1996). In order to implement the level of meta-studies, educators have to be able to choose the teaching/learning strategies and to develop students' diverse abilities supporting the acquisition of study content and development of independent creative thinking (Dunn, Dunn & Perin, 1994).

Students' needs are emphasised also in the holistic pedagogy usually exploiting such concepts as “the level of super-content” and “integrated learning models” (Salīte, 2000).

Features of the educational environment centred on the person have much in common with the current tendencies of teacher training in Europe. Teacher educators from the higher education institutions of Latvia had the opportunity to continue their acquaintance with these tendencies at the ALERT seminar held at the Latvian University in March of 2001. Some dominant tendencies in teacher training of European countries were reviewed here. It is necessary to notice that the problems of teacher training in EU had been interpreted in close co-operation of fourteen countries. Considerable attention has been focused on the organisation of educational environment, where future teachers could be involved as participants with equal rights. The active process of studies has been repeatedly emphasised.

Figure 1 highlights the active process of learning. The implementation of these aspects in the process of studies ensures the satisfaction of students' social, self-esteem (recognition) and self-actualization needs.

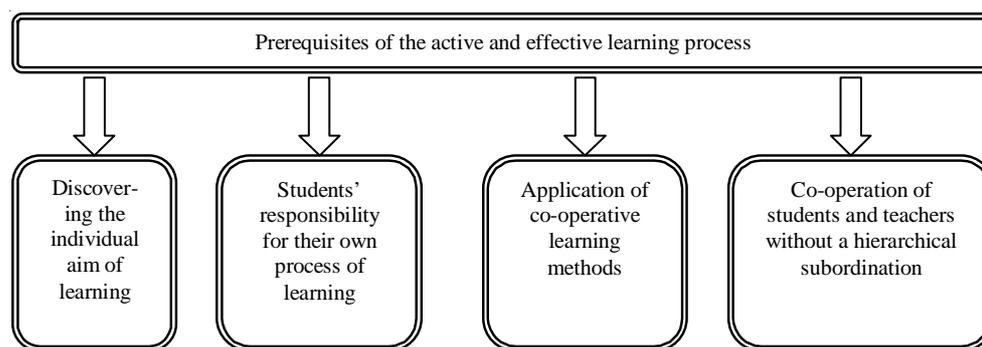


Figure 1. Prerequisites of the active and effective learning process (Buhbergers, 2001)

The analysis of the two main tendencies of educational environment evidently leads to the question, which of these tendencies currently is dominating in the teacher training in Latvia. Unfortunately, we have to admit that the educational environment both in comprehensive schools and in higher education mostly can be characterised by the educational environment alienated from the person. Thus, there appears to

be a contradiction between the educational principles and directives stated in legislation of Latvian educational system and the real situation where these principles are not implemented in the educational environment at all, or are implemented only partially. It seems that time has come to face the truth and admit that there is a gap between the real educational practice and the desired theoretical educational paradigm.

How do educators find a way out of this situation? **Firstly**, it should be accepted that the educational system is characterised by a certain degree of conservatism, since this artificially formed reality envisages definite limitations and norms. We can proclaim the change of educational paradigm on a global level, but the changes we want to achieve should not be based only on emotions. The qualitative changes of educational environment are rooted in people's minds, feelings, experience, mode of life (Žogla, 2000).

**Secondly**, the pedagogical experience in the context of higher education as well as the independent research in didactics and philosophy of education enabled the author of this paper to come to the following conclusion: one of the ways to construct an effective educational environment, to implement and introduce changes in the process of studies could be the introduction of a complementary approach. This approach looks for the strategies, methods and ways to ensure the opportunity for students to satisfy their social, self-esteem (recognition) and self-actualization needs as fully as possible in the dominating traditional academic or "alienated" environment. It means to perceive the features of an effective educational environment which includes a mutually complementing interaction and avoids explicit opposition.

Such a complicated system as the teaching/learning process in higher school cannot present the only indisputable truth, since the real educational practice requires a wider, more diverse and holistic view, focusing on the needs of future teachers keeping in mind their role as the actual carriers of changes in the educational environment.

Thus, in light of a paradigm change, both in the theoretical analysis and in the process of empirical research, it is necessary to embrace the innovations which can be introduced in the educational environment in order to achieve the results as efficiently as possible.

For in-service teacher training, this means initiating a discussion and exchanging experiences in the creative quest for better solutions.

**Thirdly**, during this process it would be very important to co-operate with students in order to get high-quality feedback; not to be afraid to hand over the initiative to students; to give them an opportunity to actively participate in the organisation of their own study process and search for solutions.

Since the student expects higher education to develop his/her highest aspirations and to fulfil himself/herself, he/she tries to discover the individual meaning of the study process. The responsibility of teacher educators is the construction of the meaningful educational environment and activities.

### **The classification of needs in the context of educational environment**

Analysis of literature allows educators to discern the different classifications of human needs (ИЛЬИН, 2000) dividing them into the needs for the subject and functional needs. Russian psychological science distinguishes the three types of needs: material, spiritual and social. Western psychology emphasizes the group of social and self-actualization needs (Fromm, Maslow, Herzberg, McClelland).

Unfortunately, the full presentation of these theories can be encountered more often in the issues devoted to management problems (Мескон, 1992). The literature in the field of pedagogy usually emphasises the theory of A. Maslow. Although this approach has been criticized for some shortcomings, it indicates possible ways for the self-fulfillment of persons able to gain the satisfaction of their self-actualization needs. The theory of A. Maslow provides a psychological underpinning of the task to develop the university level students' ability of complete self-actualization in educational environment.

### **Awareness about the students' needs: prerequisite of educational environment**

Study process in higher education has its own logic, which is objectively reflected in a specific model of pre-service teacher training. The logic of this process requires links with the awareness about the students' needs, which theoretically and practically can be established on different hierarchical levels:

**The acceptance of student needs.** On the level of the educational system in general student needs are based on the requirements of legislation and defines what specifically must be fulfilled by educational institutions in the process of studies, so, actually it is based on formal educational aims and objectives.

Pondering about the educational aims stated in the documents regulating the Latvian educational system, it is only natural to share a view of Geske (2000) that they are rather abstract, formal and relative. These aims are based on students' need to become independent, to develop personalities able to actualize their own spiritual and physical potential, and to become the members of the democratic state and society of Latvia.

Since the aim of education does not contain the implementation of specific tasks and requirements, it undoubtedly causes problems for those who are involved in pre-service teacher training. What kind of teachers should be trained at higher educational institutions? Currently in the sphere of higher professional education in Latvia, the concept "qualification" is used, which means the combination of the relevant knowledge, skills and experience, ensuring the person's competent performance of adequate type and complexity of work (Lauzacks, 1999). Therefore, one of the specific needs to be entrusted to the educational system is associated with the obtaining of definite qualification. Definition of qualification is a very important stage in the content reform of the teachers' professional education. This is a complicated process, since it is necessary to forecast the society's development in the context of global processes and global changes and to actualise the role of the teacher as the carrier of changes (Fulans, 1997). Educational systems should provide the possibility to satisfy the safety needs of students and to help everybody adapt to the changing environment in a productive and creative way.

**Regarding the teacher educators.** The awareness about student needs is related to the objective answer to the question “What do the students want and expect from the educational environment, what are their needs?” Besides, it is possible to talk about the awareness of their needs if both parties can give an objective answer to this question.

It is often necessary to state that in the real educational environment of the university, the teaching staff does not have an adequate idea of the students’ real needs and their perception of hierarchy.

Based on the assumption that the inquiry of students’ social, self-esteem (recognition) and self-actualization needs is one of the prerequisites of effective educational environment, research was carried out between 1998 and 2000 in the study groups of the Daugavpils Pedagogical University (N=350). The aim of the research was to find out the leading type of students’ self-perception within their study groups and to analyse its possible dynamics. The data allowed the researchers to provide objective conclusions about the psychological motivation of students’ activities within a study group.

The findings of the research show that in the first and second years of studies the dominating perception type of study groups is collective perception; later the majority gradually shifts to the individualistic type of perception, while the weight of pragmatic perception type remains relatively the same throughout the course of studies (Oļehnoviča, 2001). The teaching staff of DPU has received the recommendations to take into account the results of this research in order to reduce the psychological pressure and possible frustrations, as well as to choose the adequate teaching methods and forms in relation to the student needs.

The recognition of social, self-esteem (recognition) and self-actualization needs by the students was clarified in practical research.

At the beginning of the first semester within the course on History of Pedagogy, the author carried out a survey among the second year students of the Natural Sciences and Mathematics Faculty of the Daugavpils Pedagogical University (N=76). The students were asked: “If you would be the DPU teacher, what would you do in order to help students satisfy their various needs in their process of studies?” The emphasis in the interpretation of answers was placed on the research of methods and ways to satisfy the needs of the highest level as defined by A. Maslow. The analysis of the results enabled the researcher to identify very interesting ideas from the students concerning the effective organisation of the study process, active involvement of the students in the process of planning their studies and organising the educational environment. The recommendations derived from this research are presented in Table 1.

Table 1. Students' recommendations on the satisfaction of their needs in the educational environment

SOCIAL NEEDS
<ul style="list-style-type: none"> <li>• Offer tasks that allow students to communicate and form mutual relationships (group and pair work, project work, discussions);</li> <li>• Create the spirit of unity and solidarity in study groups as well as the feeling of belonging to students' community;</li> <li>• Regularly organise discussions about the students' progress of studies, the content of studies and the possibilities of achieving a desirable result;</li> <li>• Do not try to break already established informal groups;</li> <li>• Create conditions for students' extra-curricula activities.</li> </ul>
SELF-ESTEEM NEEDS (RECOGNITION)
<ul style="list-style-type: none"> <li>• Offer meaningful activities;</li> <li>• Provide a positive feedback, analyse the results achieved;</li> <li>• Encourage students and highly evaluate their achievements;</li> <li>• Involve students in the process of determining the aim of studies and in the solution of tasks;</li> <li>• Delegate additional rights and obligations to students;</li> <li>• Provide students with the opportunity to raise their level of competence.</li> </ul>
THE NEED FOR SELF-ACTUALISATION
<ul style="list-style-type: none"> <li>• Create an environment for studies and development where students could fully apply their potential (public speeches, competitions, recommendations on organisation of self-instruction);</li> <li>• Offer challenging and important tasks requiring much effort;</li> <li>• Support and develop students' creative abilities.</li> </ul>

The ideas mentioned in this article could be summarised by the following conclusions:

- In the didactic theories concerning the organisation of educational environment one can observe two main tendencies, which can be labelled as the educational environment alienated from persons and educational environment centred on persons;
- Study process in higher education has its own logic, which is objectively reflected in a specific model of pre-service teacher training. The logic of this process requires the link with awareness about the students' needs on two hierarchical levels: the level of educational system and the level of teacher educators/ students;
- In the process of organising the educational environment, it is very important to co-operate with students in order to get high-quality feedback, give students an opportunity to actively participate in planning their own study process, and to look for the best solutions, so that the process of studies can become important and meaningful to them.

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# *Towards Sustainability in Education: Principles of Teacher Educators' Professional Development*

Irēna Žogla

## **Abstract**

*A decade of transition is an appropriate period to reflect on the consequences of education in Latvia and define the main trends of further development. The article deals with teacher educators' professional development as one of the most important agents of reform in education. Three essentially different periods of intensive teacher educators' learning are specified. These are: Dynamic and planned process of individual development; Contextualized professional knowledge; and Research-based teacher education and professional development.*

*Theoretical and empirical investigation resulted in the main principles of the teacher educators' professional development during the reform and period of transition.*

*Key words:*

*professional development, teacher educators, principles, reform, sustainability.*

## **Introduction**

A tendency towards democratization in education is evident and it follows the ideas defined in the Constitution of Latvia and The Law of education, still it is important to state that democracy is a complicated process. What we call a democratic process in reality might appear as a sign of something quite opposite. Democratization is a contradictory process. In education it appears in the context of paradigm change and teachers' attitude change.

Besides, it is always difficult to state what should be prior – teacher education or teacher educators' education to succeed with the educational reform.

Among the many complex changes taking place in European society, three major trends are pointed out: the internationalization of the processes, impact of the first appearances of the information society, and the growing impact of scientific and technical development (European Commission, 1997, 1999).

Teacher educators comprise the most important group of specialists in the complicated set of reform in education: their impact is many-sided – affecting teacher education, curriculum development both at the university and schools, research in education, and implementation of theories into practice. Therefore, their professionalism should develop all its particular features to perform professional action with an appropriate quality (Ipfling, 1998). Influence of the most powerful factors upon teacher educators' qualification becomes crucial – the paradigm change in education depends on their activities (Fullan, 1995).

When the transition to the democratic education started, teacher educators (TEs) were considered as those who were to bring novelties to the educational system, prepare teachers for the changed reality, and preserve the national cultural values. Educators themselves needed an appropriate, organized further education. In several years at least three groups of TEs appeared according to the way of their further professional education – those who:

- studied abroad and brought to the country different approaches and theories;
- followed their experience and introduced little changes into teaching teachers, especially, if their study subject did not change essentially;
- critically analysed and combined new encounters with the local traditions.

The period of transition reveals such a specific feature of a teacher's and teacher educators' profession as reflection: if it were easy to analyse their own practice in accordance with the criteria of a new paradigm it would be easy to change others' paradigms. Teacher educators' experience, beliefs, and competence develop slowly during their professional growth based on their own research, delivering classes, assisting the students' school practice, theoretical studies, and co-operation with colleagues within the country and abroad.

**The goals of the research were:** a) to reflect on the outcomes of these activities in teacher education institutions of Latvia; b) to reveal the educators' attitude to their professional growth, and c) to define the main principles of TE's education to sustain their professional development. The article presents these goals integrated in the main principles of TE's education.

**The sample** comprises 232 teacher educators and participants of the teacher educators' courses. Qualitative analysis had been done to discover in what terms the educators evaluate their professional growth. Several items were considered:

- a) selection and development of productive experiences by teacher educators;
- b) the way innovative encounters are contextualised with the national cultural values and local experience;
- c) changes in teaching/learning at tertiary level and educators' attitude, as well as their students' responses to the innovations;
- d) attempts towards sustainability of education, its principles.

For the background of this research several principles of teacher educators' professional development had been defined, and their essence is presented in this article.

### **Dynamic and planned process of individual development**

Teacher educators' education and professional development should be considered as a component of life-long education. The above mentioned trends urge teacher educators to refresh their theoretical knowledge and practical skills and update their professional fitness. To help teacher educators succeed, a long-lasting project of pedagogical education had been launched in the early nineties at the Institute of Pedagogy and Psychology, The University of Latvia. Teacher educators of both pedagogical and non-pedagogical subjects attended the courses with the main aim to update their knowledge in theories and technologies of teaching/learning, Psychology, and Educational Philosophy. Within the life-long process of individual growth there are three consequent periods of assisted pedagogical education of the teacher educators from all teacher education institutions in Latvia:

- Early nineties – acquisition of Western theories of teaching/learning and educational practice at the universities of European countries, observation and hands-on practice followed by seminars at home to integrate the new encounters into practice;
- Mid-nineties – series of seminars for teacher educators at the University of Latvia with extensive participation of colleagues from different European countries (eleven in total), integration of the new encounters and the traditional practice;
- Late nineties and the beginning of the new century – co-operation and team work to improve curriculum according to the processes of globalization, information technologies, society of knowledge, to create teaching/learning strategies and settings appropriate for a society in transition. A programme for teacher educators' pedagogical and psychological education had been launched by the institute of Pedagogy and Psychology, the University of Latvia.

This initiative aims at preparing teacher educators for their successful mission at the institutions. They need to become pedagogically educated agents of changes in teacher education – define strategies of teacher education of all school subjects, constantly improve the curriculum, and disseminate the most effective experience. TE's planned and assisted professional development is of special concern during social changes and reformation of education (Stephenson, 2000). Globalization processes make transition even more complicated, and teacher's professional knowledge and skills should be developed accordingly (Glumpler & Rosenbush, 1997; Socket, 1996; UNESCO, 1998; Swanson, 1995).

The programme is designed to empower the educators and meet their particular interests. The principle of planned dynamic development comprises a sort of formal stages (singular stage), quantitative aspects of education to facilitate appropriate personal development, and it distinguishes between particular groups of TEs who might improve their personal growth. Thus, the next principle deals with TEs' encounters.

### **Contextualised professional knowledge**

This principle comprises several aspects to be contextualized in teacher educators' professional knowledge and skills: local cultural peculiarities, a set of pedagogical subjects, integration between pedagogical subjects and subjects they teach, tertiary and school education, learning to teach and teaching to teach, and academic knowledge and practical skills.

The national educational system and local traditions show tendencies of development for the system of education with orientation towards the European Union influence teachers' education.

In-service training in different European countries is a very productive form of TE's professional development, though one should distinguish among the educational settings from which the new encounters originate – different national traditions, pedagogical theories, types of schools etc. These problems might be similar in different countries, though their appearances in a particular country is contextualised in a particular way. Differences in structures of education and types of schools, different categories of teachers share their experience (for different subjects, stages of education etc.), and sometimes very particular types of teacher education for

different categories of teachers, differences in teacher education programmes between and even within countries, make comparison difficult (Green Paper, 2000).

Pedagogical subjects are delivered by teacher educators who follow different philosophical and educational approaches, and co-ordination between them at least within one educational institution becomes essential. It is stated that teacher educators follow different theoretical and practical issues sometimes without clear identification of the approaches or philosophies these issues belong to.

There is still a contradiction between pedagogical and other subjects – such an integrated phenomenon as a subject matter might differ greatly in different cultures. Usually the discrepancy is based on the teacher educators' specialization (education) and beliefs: either students' learning or the subject matter, learning skills or the particular skills of the subject are in the centre of pedagogical process. Nevertheless, it influences teacher educators' action competence – being able and willing to perform professionally (Schnack, 1994).

Another context – tertiary and school education, education of future teachers for teaching at school – deals with a problem of age and level of education of their students as well as different types of schools. Subjects which the TEs deliver are to be contextualised to the students learning skills, academic knowledge and practical skills, development of TEs professional beliefs and skills of teaching – higher education for further school education.

Several levels of contextualisation should be distinguished (supported by the investigation during TEs courses at the University of Latvia):

- a) modern theory of education, pedagogical approaches and the way of their practical implementation in a national context, clear idea of further development of the national system of education (educational policy, particular type of school etc.);
- b) encounters from different sources, theoretical and methodological issues or practical settings should be analysed and classified according to its essence – what is common for any learner of a particular age or level of development and the variables (based on local educational traditions and school settings and, therefore, possible or effective in this context);
- c) clearly defined quality of education in a particular context, clear ideas of how to organize pedagogical settings to reach the desired (defined in programmes) aim (Vught, 1993) – it sets forward a demand for every TE to reach an expert's level in a particular field and be ready to act in a team with other experts;
- d) issues in education operate with non-pedagogical notions borrowed from marketing, production or other spheres; they are often used in a wrong way and are misleading, create the impression of simplicity of teaching/learning (Fjelds, 1998; Snoek, 2001) – thus TEs must be able to identify the corresponding phenomena in pedagogical settings, define them in pedagogical terms.

## Research-based teacher education and professional development

Transition first of all means changes and investigation of their outcomes and changed pedagogical situation. As to TEs, their education is investigated from the point of “about” (Rojas, 2000) or sociology of TEs (Ducharme, 1995). Teacher educators develop their professional skills mainly during or by their doctoral studies – this approach is overwhelming since there are a few publications on teacher educators’ education. Meanwhile the changes in this area of education are to cause changes in schooling and make these changes productive. Teacher educators are the agents of reforms and their education should be based on constant research – this is a view held by the TEs who participated in the above mentioned courses. It is even more important because TEs themselves are researchers (Hollingsworth, 1995).

At least three areas of research in TE’s education are of the major importance (for a society in transition):

- Research based curriculum development of university or teacher education institutions is a must since orientation of the society and needs of the individuals have changed, production is reorganized and enterprise education adds both to teacher and teacher educators’ professional development;
- Teachers’ professional qualities are to be developed during their studies, including professional ethics;
- Programme of TE’s life-long professional development, defined criteria (on the background of research) for qualitative changes in the specific context.

## Reflection as an expert’s quality and attitude change

At least three aspects of quality should be discussed – TE’s personal qualities and pedagogical fitness, qualities of the future teachers to be developed at the university or other teacher educational institutions, quality of the material basis of the educational institution for teacher education (to acquire appropriate theoretical knowledge and practical skills).

Quality is a specific function, it comprises content of activities, continuous organizational improvement, rhythm and speed of activities, involvement and culture of activities (West-Burnham, 1997). Quality in education also means realistic aims, appropriate organization of their fulfillment, non-stop professional perfection of both TEs and teachers, constant reflection on activities.

The criteria of quality (Harvey & Green, 1993) include:

- clearly defined, up-dated and contextualized aims of education, their specific and explicit content;
- theoretically based and practically reliable criteria of quality in education of all levels;
- reflection and research of educational practice, and vision of possible improvement;
- changes in TE’s personal qualities and ability to identify them – attitude and professional fitness in a changing system of education, position of a recognized agent of the reform, preserved qualities of professional ethics within dynamic and contradictory social processes, flexibility, expert’s quality in TE’s professional activities.

Both novice and experienced teacher educators have to face the specific phenomena of their professional growth in the society, which is still in transition. Consequently they pass through several stages of professional development (Berliner, 1995):

- novice or the one who has to acquire a new paradigm, approaches and practice to reach a new professional quality – paradigm change usually causes less difficulties to flexible educators. This is the stage when educators need planned assistance, they willingly join courses to learn more, to understand different pedagogical approaches;
- competent level for the experienced TEs appeared to be regained in the new social situation. In early nineties it became clear who were able to confirm this status. Previously mentioned courses assisted TEs in their attempt as well as in working out and clarifying the conception of higher pedagogical and university education. The main aims of their continuous learning were at least three – a) to up-date the ability to make conscious choice within a large number of new ideas and foreign experience as well as foresee possible consequences; b) to learn how to distinguish essential and important pedagogical phenomena from bright appearances of less important, unnecessary or harmful appearances; c) to preserve and enrich national cultural values in the context of common human values shared by different nations.
- every teacher educator has to reach an expert's level in a branch of their research or academic activities to share their competence with others and to guide development of this particular branch. The educators experts are characterised by colleagues and students as innovative, responsible, critical and self-critical, prognostic, knowledgeable.

Reflection and self-evaluation at each of the stages and planning of continuous professional development was mentioned by TEs among the most important preconditions of their professional development. Among the most complicated problems caused by political transition reflection was mentioned, as well as development of one's ability "to change a mirror for a window". TEs concluded, that "new encounters come easy, it is difficult to get rid of old habits and standards, to distinguish between valuable and secondary things" (from the reflections of teacher educators). It was difficult to refute from the predicted norms, following one ideology and instead of that accept plurality, and to find pedagogical means how to introduce plurality.

Knowledge and practical skills are very important, though they remain inactive if attitude to innovations is unchanged.

What makes a good teacher and a good teacher educator – "the ability to connect new ideas to existing knowledge or prior experiences, to engage students in learning, to organize content around clear, challenging standards, and to build on an individual's strengths and experiences..." (Owen, 2000). What guides the educators to do so is his/her belief, attitude toward innovations and personal professional qualities.

Attitude dynamics is characterised by several qualitative stages with their particular criteria: a) attitude depends on the situation and external support; b) attitude is based on TE's experience, mainly on practical skills; c) attitude is stable, based on self-regulated innovative professional action (Čopona, 1996; Žogla, 1998).

### **Agents to transmit cultural values**

This principle was mentioned by teacher educators as one of the most important, especially for the period of transition. Culture as a quality of social development is inherited from generation to generation by education (school, social activities, communication and contacts with people and nations etc). Every nation or even a part of it, though, keeps in contact with other nations, live in their natural and social environment with specific features of their culture, which is protected to some extent by education. Thus education aims at such values as survival, welfare, ability to create background for prosperous life of future generations etc. These are items for teacher educators' planned courses, a matter of their particular attention and discussion in a changing society.

At the same time education is a way cultural values are enriched by introduction of the cultural values of other nations, and the acceptance of values by people is measured by their actual need of identity.

The stronger the feeling of losing one's ethnic or national identity, the stronger is the desire to define particular educational aims to protect and preserve them – this statement is defined by TEs and suggested as a component of their further education planned at the university.

The activity of a cultured person is characterized by responsibility, therefore, teacher educators need a methodology for values education. International cooperation would be of great benefit.

Exchange of cultural values expands due to the rising global cooperation, and it is mentioned by teacher educators as an aspect which causes new problems – education should slowly introduce the idea of globalization to avoid destructive outcomes: beliefs need some time to be adopted or changed. Education can soften the process by the component of culture in the curriculum of teacher education and by developed and up-dated methodology acquired by teacher educators preferably in a team.

Teacher educators' cultural mission in a society claims to be supported by politicians; on the other hand, teacher educators themselves should be organized and demanding so that decision making in education is based on competence (at least in a country in transition).

### **Integration of theory and practice**

School-based TE's education means contextualization of the delivered pedagogical subjects with school practice where the future teachers are going to teach. It means a clear pedagogical value of the subject he/she delivers at the university.

The majority of the teacher educators consider that all educators of all subjects (not only pedagogical ones) should know the reality their students are going to enter: needs and orientations of the pupils, curriculum, problems, realities of the reform etc. Therefore, pedagogical knowledge and skills become of great importance and should be treated as a component of TEs' professional qualification (Ferrerres & Imberton, 1999; Alisch, 1995; Combe & Helsper, 1996).

It could be concluded in this way: the more elaborated the theory is, the more it needs to be supported by practical activities to reach its productivity and empower the teacher educators.

## Team work and co-operation

“Cooperation among teachers opens up doors to additional resources and may reduce workloads by helping teachers to avoid the duplication of effort that occurs when they work in isolation” (Owen, 2000). It is only one aspect of benefits. Actually there are several priorities recognised by teacher educators. First of all we have to distinguish between team-work within the institution and cooperation with their colleagues in other institutions or countries.

Team-work is recognized as the most appropriate form of partnership for curriculum development, research, teaching/learning and publications (Bezzina, 2000). Actually it is the only productive way to reduce workloads, reach higher quality of both personal development and teaching/learning, coordinate efforts, learn more about the students, integrate subjects – theoretical courses and practice (views of the TEs).

Cooperation among teacher educators and students allow the partners to sense a coherence in their academic programme and a consistency of expectations (Owen, 2000). It creates productive mutual relations, attitude, and serves as a sound background for evaluation and self-evaluation.

Cooperation with the other institutions and colleagues inside the country and abroad is treated as a necessity to share experience, evaluate and compare educational results. It is recognized by teacher educators as the most appropriate form for the society in transition and one of the most important preconditions of sustainable development of teacher education and educators’ professional development.

### Discussion:

- principles of teacher educators’ professional development;
- continuous professional development is a subject of special concern of the government, institutions and national professional and scientific associations as a dynamic component of a developing system of education;
- scientific and academic quality of the educators together with the teachers’ professional development constitute the most important supervised components of the system of education, it adds to its quality in general and sustainability in particular.

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# *The School Program as a Process*

**Detlev Lindau-Bank**

## **Abstract**

*The article focuses on an issue how to involve the teaching staff in work on a school program; how this work can lead to and be integrated in a process of the school development. The article resembles my experiences as an external consultant obtained in different school development processes. The most important insight is that school programs are as different as the schools are. This assumption indicates that a general answer to the question how to design a school program is quite difficult. So, the article is restricted to the description of the basic aspects and functions of a school program. Further it points out that it is impossible to support school development by placing an obligation on schools to design a school program. It is important to show the benefit of working on a school program as well as to get a new understanding of school program as a process. The efforts of a school staff to create a systematic program for the school lead to three strategies of developing a school, which will be outlined at the end.*

*Key words:*

*school program, working schedule, guiding principles, curriculum, staff communication, strategies of school program.*

In Germany there are no extensive empirical researches on the process of school development and its influence on the school program. It is not my purpose to add one more description to the already accessible resources (Krainz-Duerr, Krall, Schratz & Steiner-Löffler (Hrsg.), (1997); Landesinstitut für Schule und Weiterbildung NRW (Hrsg.), (1997); Bühren & Rolff, (1996)). On the basis of these different sources and the experience of my own I would try to describe the tasks and problems emerging if working on the school program should lead the school to the necessary changes and processes of the development.

It is not obvious, that guidelines provided by Ministry of education (or other external institutions), ordering the schools to start the work on the school program, would lead also to the mandatory discussions on the pedagogical attitude of teachers and optimization of the teaching process. This, of course, is not the official point of view in German Ministries of education, although, the formulation of the instructions could trigger the thought that there is a cause-effect relationship between the obligation to design the school program and actual improvement of teaching/learning quality. These relationships, surely, are possible, because the effective school program fosters the purposeful management of quality development in peculiar school.

## **Initiative from outside – leading from inside**

What gives the impression that guidelines of school program directed to the school administration and staff can at once influence the school's development? First of all, it has to be admitted that instructions for developing a school program force schools to move. The school principles and teaching staff have to take into

account the new rules, because the school law orders that. Anyway, the strategy of change always comes from outside: with a new colleague, a new principal, or by the new guidelines. This is how it works and nobody can really explain why. From this fact is often concluded, that reaction, development and changes, taking place in schools can be led by the detailed description of the type of development and with a help of compulsory parts of the program. For example, the guidelines of the school program provided in Lower Saxonia indicate that the school must have a working schedule and a plan for evaluating the successive school development as the compulsory parts of the school program. The program of work looks like the plans for the short-term project clearly reflecting what does the school, for instance, in a year, wants to do in order to achieve the aims set by the school itself. As a regularly reviewed collection of separate sheets this working schedule supplements the school program. The achievements should be regularly controlled and assessed. The guidelines of this kind, naturally, lead not to the developmental process, but in worse case to the counteraction or resistance. Though, there are plenty of discussions that organization development and related changes in people's behavior should not be interpreted as a mechanical model of the cause and effect, this model is still widely believed and accepted.

Avoiding from the concept of the school as a mechanism and treating the school as a living natural system and as a group of people, I would like to emphasize two problems, frequently appearing in discussions on the development of school program.

**Problem 1:** The development can not be regulated: the specific guidelines, with an aim to promote the school development by means of a working schedule can lead to a dissonance with the individual culture of school and teaching. From the point of view of the *gardener's pedagogy* development is a plant, which can be only looked after and cared about. Let's imagine that you are standing in front of a plant and conduct it presumably in the right direction. The plant, even after many years, will do what it normally does: it will grow. The natural system is guided not by the end product but by the things important for it's development and growth. The school program operates only to give an explanation of peculiar processes and to encourage the school to act in accordance with this explanation. The development can not be regulated and fastened, you can do this only with machines.

**Problem 2:** The development can not be measured and compared. The assessment as a component of the school program can lead to the wrong assumption that a process of development can be facilitated by regular assessment and, therefore, this process can be compared with any other. Quantitative measurement separates the things inherently connected and united.

This mechanical concept has led to the large number of great inventions from the steam engine to the computer. However, it also has confused our understanding of the processes and their meaning. Regarding to this, I would mention the concepts from the gardener's pedagogy again. The nature cannot be measured and compared. The nature follows the patterns, structures and limiting rules, and, in line with them, regulates the process of development. Nothing is perfect in the beginning of its growth, and development does not lead to the expected results and products perfectly. Taking time to comprehend it, it becomes self-evident that assessment and comparison are unnecessary activities in the process of development, as they abandon the significance of relationships and structures.

The assessment should be understood as a qualitative term, as a discovery of the developmental potential, as a desire to understand the essence of things, not the assessment of the achievements. Otherwise we are trying to fiddle with the schools and their learning processes without understanding them.

I have mentioned the concepts from the gardener's pedagogy so often, because in the guidelines of the school program I discern an attempt to avoid the mechanic understanding of school and curriculum. Many supporting activities provided by Ministry of Culture point to the fact, that administration does not want to force the development, but to promote it. The school administration shows some promising activities dealing with the hierarchy.

The hierarchy is a principle of order, which can be observed in natural systems, too. The living systems do not concentrate the developmental power around the one point of hierarchy. The understanding of this feature can be noticed in guidelines, which clearly state that schools themselves should determine the content and criterions of the development. The leading power should be placed where the development occurs, i.e. in schools. Existence of school's leading power can be demonstrated by the first reaction of the teaching staff and administration on the content of the school program guidelines. This reaction could be compared with a slamming of breaks, which leads to the full stop of the vehicle. The guideline encourages taking a new turn. However, this new way is not so familiar, so the decrease of speed is quite evident for me. The full stop is like a falling back on the old behavioral patterns. This can make sense, because the old strategies were productive up to now.

There is a need for a brief explanation, what the falling back on the old behavioral patterns do means, though, some specific forms (mostly perceived as a resistance) are already known. Falling back on the old behavioral patterns means the decision made by many schools to design the "façade" program. In the context of hierarchy schools interpret the encouragement to design the school program as an inspection. This leads to the specific attitude towards the school program, which could be articulated by the expression: "Let's make the best from this." The best usually means the most harmless. The harmless program means: do not change the routine, avoid the disorganization, useless work and overwork.

The decrease of speed is the first reaction of leaders and should be highly welcomed. This reflects the lack of overview and awareness about the usefulness of intentions. What does the school program really means and what kind of benefit school can get?

### **School program – turning points, stumbling blocks, and components**

The school program is the documented concept of the school development. Common leading educational ideals and specific intentions (work schedule) serving as the tools for the achievement of aim are listed and explained in the school program. The school program is alive only if it is grounded on a process common for all the school members having a concept of excellent school. The school program clearly points out the most important priorities of the school. This is a basis for the systematic assessment of achievements and it is useful for the school's public relations.

"The school program is a written summary and specification of school ideals. It contains the principal agreement on aims and strategic activities (for instance,

achievement orientation, management of the sporting activities, practice of the home assignments etc.) fixed in a written form of behavioral guidelines. This means the basic principles, self-definition, setting of aims, methods of work and the most important aspects of work, options, competence in the professional fields, potential, cooperation, social life and environment, structure of organization and culture, history of school, financing etc.” (Schratz & Steiner-Löffler, 1999, S.215).

The school program contributes four most important aspects to the school’s culture of work, which I would call the “turning points”. First of all, it is the cooperation of teachers. Cooperation should not be occasional and it should involve the whole teaching staff. Secondly, agreements and decisions have to be documented in a written form. Thirdly, there is the necessity of public relations and accounting. The fourth important turning point, to my mind, is that in order to set the aim and to make the intentions of the school program the regular assessment is required.

“The development of the school program stems from the two sources (...) and leads to the two products. The first source consists of persuasion about the current conditions in school. The development of the school program grounded only on the analysis of the current conditions, i.e. the general diagnosis, often does not work out, even if it is ingrained or considered so. If you are standing both feet on the ground, you can hardly move. Therefore, the first source – the reality – should be supplemented by the second source of fantasies and visions. The last source determines the perspective on a future integrated in a school program, which would take you off the ground (staying just as the vision), if the stream of ideas could not merge with the stream of analysis. The concept of stream neatly characterizes the developmental process of the school program. The stream or process of the school program development, of course, is endless; however, it should lead to products, more exactly, two products. To achieve this at least six to twelve months is necessary. The first product is the text of the school program issued by the competent commission. The second product is the implementation of the most important points of development and projects. Without the ideas about the implementation the school program would be just a piece of paper, although the process would create some movement in a teaching staff” (Philip & Rolff, 1999, S. 23 f).

Another turning point is the demand for a school model (in the sense of leading ideas), because this model emphasizes the identification of own activities. Motivation, orientation towards the future and joy of learning is the big issue. The school model is the brief summary and representation of the central values and leading aims important for all school members. The school model can be examined by observing the school’s current undertakings.

The ideal of the school is expressed also in the guidelines and visions of school. If a vision seems to be achievable, the productive tension between the reality and basic guidelines of the aim arises, stimulating the positive influence of ideal upon the school development.

Development of the school model should not lead to the situation that the norms and values of only one group are accepted. The variety of values in a large school is a natural. No one would refuse from own central issues without a deep understanding of the other ideas. If school does not want to exclude the part of teaching staff, leading ideals should clearly indicate that pupils are educated in an atmosphere of value diversity and opposition.

“The leading ideals as a quintessence of the school program should enable the communication in two directions, inside and outside the organization. Communication is possible on a subject formulated shortly and concisely. The short formulations are not only the more exact: in a complicated situation they can be differentiated. Therefore, the short leading ideals can be developed into the long explanations” (Philipp & Rolff 1999, S. 72).

Philip & Rolff objectively indicate the ability of communication. Detailed explanations hide discussions, arguments and decisions, turning the work into the learning process for all school members. School without the leading ideals is a school unable to communicate. This is a fundamental criticism especially for an organization where the initiation of learning and communicative processes has to be the daily concern.

Let’s discuss the definition of the school program from another perspective, from the point of view of a person not interested in changes, considering the existing educational culture to be good enough. This is the first stumbling block on the way to the school program.

The initiative of the school program is the harsh criticism of the existing order: there is a lack of collaboration at school, dominates the setting of the aims in own way and, therefore, the delivering of lessons in own way. There is a miss of systematic work at school, lack of transparency and trust, because there is no clear agreement and schools are refusing from competition with other schools. Before the development of a school program schools have to deal with a criticism of this kind.

Schools have been developed all the time and, probably, they would be developed without the school programs, just in another way. Previous attempts have to be clearly appreciated. It should not be too difficult, because the beginning of a developing process mostly is a stocktaking good school should not be afraid of.

The implicated criticism is a stumbling block if one wants to motivate the teachers to participate in work on a school program as in a process. A support in a form of relevant further training or help from the consultant of the school program likely will strengthen the implicated criticism and does not facilitate the search for solutions. Anyway, the staff has to answer the following question: Why does we need the school program? As it is shown in the Figure 1, the school program can perform the four functions relevant to the analysis of work in school:

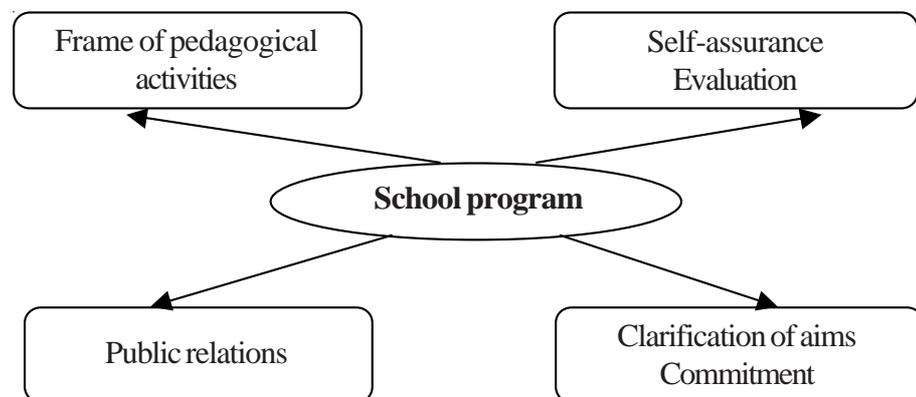


Figure 1. Why do we need the school program? (by Buhren)

Of course, it would be preferable, if the school program could perform all four functions simultaneously. Though, it does not seem to be achievable in reality. If a school program is designed for the public relations, it should have a positive appearance and it should serve for the advertising purposes. In this case the self-critical exposition of problems, shortage of resources and competence would have an opposite effect. Nevertheless, the critical assessment exactly is the foundation of evaluation. Discussion about the frame of pedagogical activities should reveal the diversity of concepts on up-bringing and didactical activities. The frame of pedagogical activities has to leave a space for controversies and individual experiments. Discussion on the common aims leading to the commitment to the priorities obligates the entire school to take a common direction and limits the frame of potential pedagogical activities.

This leads to the next stumbling block: functions of school program are controversial. Commencing a work on a school program one has to find out which functions have to be performed by the school program in order to coordinate the type of actions, the methods and results. In this way the school program should be looked upon as a long-term task of school development and at the beginning only one function has to be analyzed, i.e. the designing of the excellent brochure or articulation of leading ideals. Regardless of the emphasized function, the documented school program usually contains the statements on organization, educational and school culture as well as on cooperation. Following figure illustrates the several potential components of the school program:

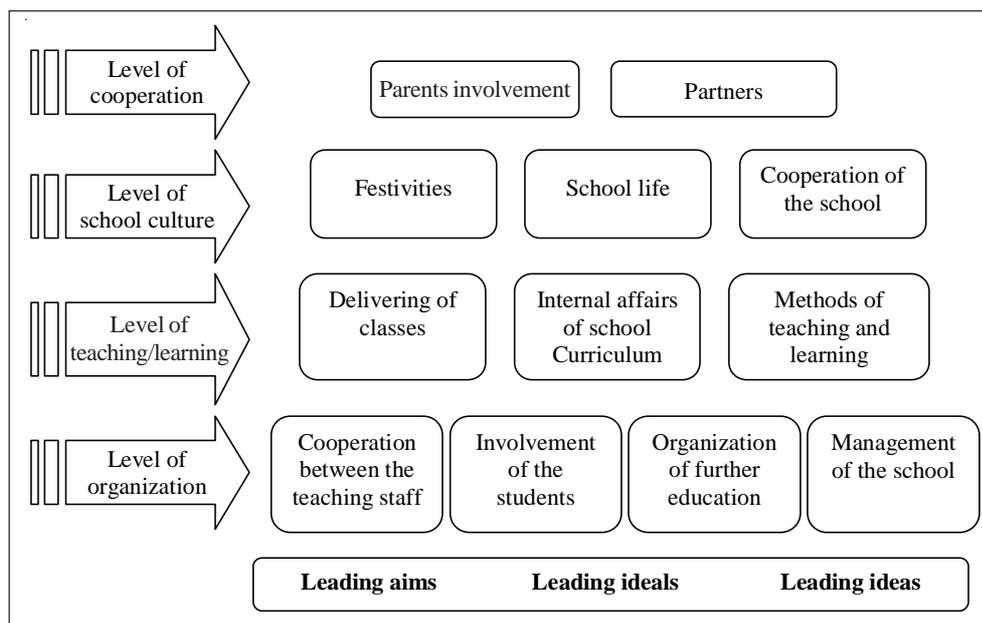


Figure 2. Components of school program (by Buhren & Lindau-Bank)

Important component of school program is the leading ideals. It is not a coincidence that in the Figure 2 this component is depicted as a fundament. Every school has it's own implicated leading ideals serving as a measuring point for all activities. Detailed summary of aims displaying the missing or expanded details clearly indicates the existing leading ideals. Coordination of specific details and people behind

them enables the testing of the coexistence of different leading ideals, unanimity of teachers and, therefore, explicit leading ideals, not documented yet.

Categorization displayed in Figure 2 is an attempt to present the school program as a concept embracing entire school. Another way could be to emphasize the didactics and teaching methods as a central aspect of school program. Ministry of Culture of Lower Saxony offers another way:

As a compulsory core of school program the following is intended:

- Statements on the following concepts and perspectives of pedagogical work:
  1. Concepts of learning, methods and social form;
  2. Fostering of social/value education and articulation of regulations regarding the school and classes;
  3. Principles of achievements' evaluation;
  4. Support for the special groups of students (i.e., underachievers and advanced students);
  5. Opening of school to the cooperation with the community partners;
  6. Orientation towards a professional and labour market;
  7. Involvement of students and parents and cooperation with the supporting institutions;
  8. Principles of assembling and conduction of classes;
  9. Planning of further training;
  10. Principles of school budget distribution.
- Work schedule for a next year;
- Suggestions on internal assessment indicating the terminology (Ministry of Culture of Lower Saxony, 1998, S. 14 f).

So far about the components of school program. But how to get the school program? The next chapter will describe the possible strategies of school program.

### **Strategies of school program development**

In this context strategy means the plans explaining the way how the changes will be implemented in line with a politics and culture of school, taking into account the interests, abilities and positions of school members. Strategies require a process which has to be planned beforehand.

If the design of school program is not the end in itself, school needs to create the reflexive feedback on the processes of school development (see Figure 3).

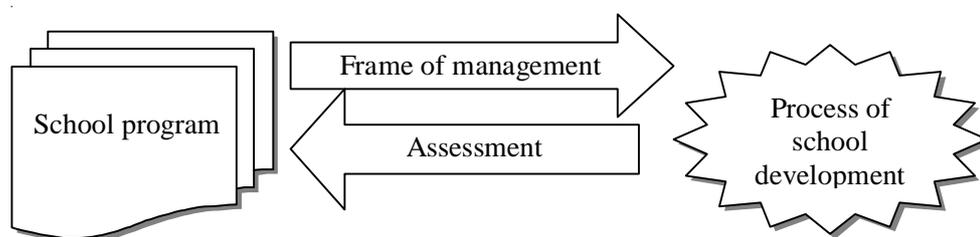


Figure 3. Impact of a school program

In this case school program is not only the assessment and accounting. It also determines the frame of management of a school development processes. It has an

impact on the different areas of school work. The aim is an effective school capable to face the modifying social challenges and to prepare its students for a future.

**D. Lindau-Bank**

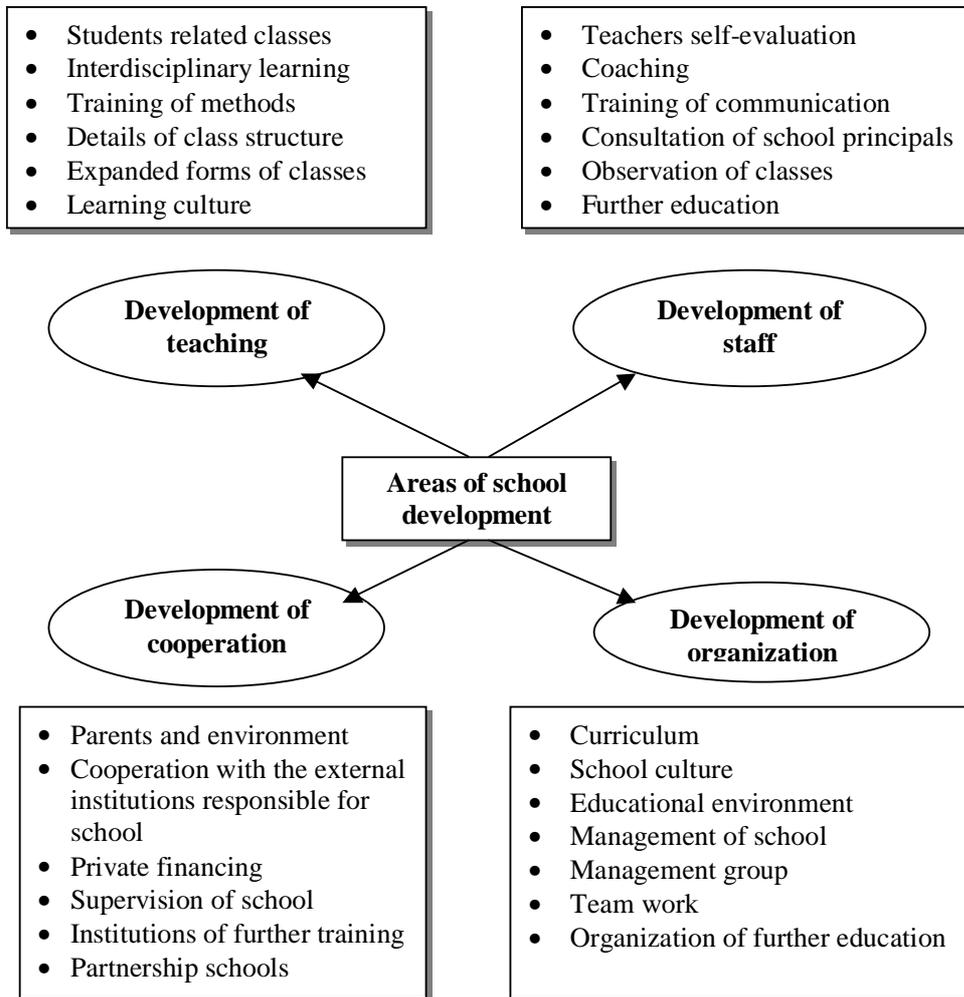


Figure 4. Areas of school development

School development, as it is shown in Figure 4, can be described as the development of curriculum, professional activities, enhancement of teaching staff satisfaction, development of school as the efficient organization, as well as the improvement of school relationships with its environment and external partners (cooperation).

Comparison between the school development areas and the components of school program clarifies the significance of school program embedded in the process of school development. In this case the school program becomes a step to the systematical development of organization. As a consequence, it causes the changes in the structure of school organization and this could lead to the possible conflicts with the school culture in the field of communication and planning. To avoid and relieve this kind of conflicts school should choose an appropriate strategy. Criteria for the selection of a strategy have to be determined by the teaching staff considering its' utility, necessity and acceptability.

### **First strategy – starting with the analysis of leading ideals**

This strategy envisages the principal discussion with an aim to make an agreement about the school regulations. The advantage is: school can deal with the essential pedagogical issues, which do not receive enough time and space in a daily educational process. In many schools this process is described as the necessary, motivating or liberating process. Second advantage: you can start easily with a conference and the whole teaching staff can participate in this process.

But this strategy is also the most complicated one. It only makes sense if it meets the needs of the majority of teaching staff to discuss the common pedagogical aims.

Hopes that the articulation of leading ideals could lead to the homogenization of value ideas of individual teacher are too much to expect from this strategy. Either the leading ideas will be articulated trivially, in abstract manner (i.e. for the well being of children), everybody will be able to discern own ideas or values, or the leading ideals will be accepted without the consensus of all teachers.

Therefore, the assessment of leading ideals emerging in different school projects is a way towards the discovery of leading ideals. All activities of teaching staff have to be investigated in the process of assessment. Afterwards, in a teacher conference teachers have to compare the different leading ideals, to review and discuss the common features and differences.

Struggles about these leading ideals, not the ideals as such are the driver of school development.

### **Second strategy – changing the curriculum**

Some teachers would prefer the development of school by means of practical changes in their classrooms.

They do not want to be impeded and burdened by empty discussions on the aims and values. They perceive the work on school program or leading aims as a hindrance of their daily work. In the second strategy the way is more important than the aim to write a school program. Teachers possibly wish to develop their skills and, first of all, to obtain the tangible results. Anyway, they try to implement new methods of teaching to break the routine. This strategy should serve as a background for leading ideals and school program.

Curriculum strategy often receives the reproaches as a strategy of doing things for the sake of doing things, allowing everybody to do as they wish. To detain the development of patchwork school there is the necessity for regular evaluation of new initiatives of educational process.

Summary of documentation provides the foundation of curriculum. Besides, the process of this strategy asks for the intensive coordination mediated by the school administration and a team responsible for the coordination of all activities. There is a need for the common clarification of future plans, which has to be supported; for the content and methods necessary for the development of educational process. Next stage of curriculum strategy is the documentation of the coordination processes. Ensuring this, in a few years given strategy could lead to the design of a school program. Advantage of this strategy is that not all the members of teaching staff have to participate from the beginning and that the school program does not develop simultaneously with the teachers' work at school.

It is important to notice that in Germany the regulations of school program establish the strict deadline for the submission of school program, but this does not mean that completed and flawless program are expected. Nothing starts from the complete growth.

### **Third strategy – developing a school program**

School program strategy is the ideal type of process. In this case the way is as important as the aim. School carries out the assessment of most important details of school program. Assessment stimulates the setting of aims for the further work in cooperation with the whole teaching staff, engaging the parents and students. Every single element of the school program important for school has to be expressed in the form of project ideas and then implemented. Documented components of school program are discussed in all relevant commissions. Operation program has to be designed as a collection of separate sheets revised and discussed in these commissions regularly.

Advantage of school program strategy is the orientation toward the common school development and participation of all commissions operating at school. Precondition of this strategy is a collection of school experience in the area of organization development and project management, as this strategy demands the high level of division and coordination of labor. I think, that this strategy is very appropriate for the small schools with an easy reviewed offer.

Negative aspects of this strategy: production of school program asks for the extensive financial resources, besides, daily concerns usually make to forget about this program. This is especially true in case of teachers who have not invested their efforts in the creation of this program. This also testifies the necessity to involve as many teachers as possible, as the end product becomes very important for them. If at last the school program is ready, it is just ticked off and does not play any role in daily work. School program strategy demands the constant efforts from every school member to recall the school program all the time, for instance, referring to this program in the discussions during the school conferences.

### **Result**

All three strategies of school program have been described as a typical. They all have one feature in common: they all have a sense only in case if majority of teaching staff agrees on them, if this work is based on regular assessment and the results of activities are documented. A school program as a process depends on how far a school has set up a structure of communication and cooperation, which enables the teachers to clear their different interests and needs. In the center of the process stands the teacher as a professional. Around it the process needs time and space to deal with problems and conflicts.

Further, the quality of a school program depends on the reflection and evaluation of teachers concrete work. Otherwise a school program is impracticable.

Finally, a school program has to be documented in a written form. This is a new demand in German schools. It strengthens the commitment of school quality development and points out the necessity of public relations and accounting.

School development is not only a matter of technical questions. Schools need more competencies in communication, evaluation and project management to design a process successfully. So, teachers, principals and administrators have to widen their point of view from the products of quality management to the process.

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# *Teachers' Views on the Aim of Education for Sustainable Development*

Ilga Salite

## **Abstract**

*A significant step toward the introduction of strategy for sustainable development was the New York summit in 1998. On that occasion the UNESCO Commission for Sustainable Development recognized the reorientation of teachers' education as a priority if sustainable development policy was to be implemented all over the world. In 2000, a UNESCO international project was commenced. Its purpose was to initiate and compare national investigations as well as to design propositions for a global reorientation so that teacher education worked towards the aim of sustainable development. The purpose of the action research described in this article is to identify Latvian teachers' and university students' approaches to how aims and principles of education oriented towards sustainable development may be defined.*

*The research under review presents one of the tasks performed as action research initiated at Daugavpils University with the aim of reorienting the teacher education towards sustainable development and extending understanding of anthropocentric and ecocentric approaches surrounding sustainability.*

*The article contains methodological considerations for the selection of case, peculiarities of the research method, as well as results and conclusions obtained within the case study.*

*Key words:*

*sustainability, sustainable development, anthropocentrism, ecocentrism, complementarity, aim of education in anthropocentric context, aim of education in ecocentric context, approaches to the aim of education, education for sustainable development.*

## **Introduction**

The need for education oriented toward the aim of sustainable development and the reorientation of teacher education toward communicating this aim should be examined in a wider context. This context can be constructed by examining what is considered in the introduction of the concept of sustainable development and by trends of how the subject is perceived in various fields of social actions and consciousness, particularly as they, explicitly or implicitly, influence changing practice in education. Canvassing definition of the context enables us to decide on what the essential aim of education orientated towards sustainable development should be and then turn to the search for adequate solutions in the field of education.

The concepts 'sustainability' and 'sustainable development' began their public circulation with "Our Common Future" or Brundtland Report (WCED, 1987). At that time, these concepts were described as a 'systematic, long-term utilization of natural resources ensuring the accessibility of these resources for future generations'. The interpretation of these concepts stressed the urgency to consider the

economic, social and political underpinnings of the problem. Following this, the Conference in Rio de Janeiro emphasized the significance of sustainable development in Agenda 21 (United Nations, 1992). This document introduced the principle of sustainability and declared the necessity to apply it to economic, social and environmental aspects.

Furthermore, the concepts of sustainability and sustainable development embrace the experiences collected in different fields of theory and practice. For example, in the studies of forest resources (Filho, 2000) during the 1970s, the concept of sustainable development was introduced in forestry, with a view of planning ahead for forest use by future generations. Initially, in education the issue of sustainable development was identified as one of the global problems and it was dealt with as a problem of relationships between humans and nature, recognizing the need for protection of nature, as well as the need to restrict the technocratic and egoistic aspirations of human beings. An ecological/environmental issue or even the present ecological crisis was perceived as the consequences of actions carried out by previous generations. These consequences occurred as a threat to the existence of the ecosphere and also as a convincing proof of the idea that the aim of human actions should be searched for outside the boundaries of egoistic interests of human beings and that this aim of human actions should be oriented to maintaining a healthy natural environment.

Since the Bruntland Report (1987) and Agenda 21 (1992), the interpretation of concepts 'sustainability' and 'sustainable development' have been marked by rather extensive diversity. A number of concepts have been used. For example, harmonious, coherent, caring, long-term, future-directed development, and other terms are still used as synonyms to denote sustainability and sustainable development. Also, as a basis for these different interpretations, mostly anthropocentrism and, very seldom, ecocentrism has been considered. Anthropocentrism exaggerates the significance of human beings in the biosphere and convinces us about the capability of human beings to understand and control natural processes in a desirable direction. On the other hand, ecocentrism is looking for ways of creating cohesion with human life and life-supporting systems, as complementary components within the ecosphere. A sense of attachment to the ecosphere provides the foundation for conviction and responsibility in the context of ecocentrism. Anthropocentrism and ecocentrism allow the discernment of two easily identifiable levels of study that search for solutions in education within the field of sustainability/sustainable development.

- *Energy connections between humans and the environment, including resource exploitation.*

On this level the focus is on the development of normative criteria for these connections, such as the monitoring of human actions, the calculation of the ecological footprint of human impact on nature and other quantitatively measurable interactions.

- *Psychological relationship with the ecosphere.*

This relationship makes it possible to undertake studies of the aims, values, attitudes and types of actions typical for human beings. Moreover, the psychological relationship with the ecosphere can be described as human attitudes regarding is-

sues of energy and resources exploitation. It may even be considered as the psychological link to the ecosphere in coherence with its evolutionary nature. This type of connection, by analogy with the previous one, can be called the ‘footprint of human attitude’ on the evolution of an ecosphere. This measure can be used to characterize and evaluate the quality of human groups interacting with their environment. The attitude footprint on the evolution of ecosphere can be described within the perceptions of ultimate goals and values as well as within the selection of action types, learning approaches and learning styles.

Both levels of seeking solutions for problems of sustainability/sustainable development have been gradually adopted and developed in the curriculum worldwide. Currently, they can be discerned as typical approaches to education. When energy connections and resource exploitation are studied, anthropocentrism becomes the dominating orientation in education and constitutes the foundation of curriculum. When the psychological relationship with ecosphere is examined, the basic aspects of curriculum are searched for in anthropocentrism and/or ecocentrism. Therefore, within the curriculum, the aim of human actions and education for sustainable development can be derived both from anthropocentrism and ecocentrism. Regarding genuinely sustainable development, its aim should be derived from the context of ecosphere as it is more extensive and sustainable in its essence than by taking a purely anthropocentric view.

### **Changes of attitude to anthropocentrism and ecocentrism**

Discussion about the role of anthropocentrism and ecocentrism in the escalation of global environmental problems started in the 1960s. Anthropocentrism was admitted as a reason for the development of global problems. Since the 60s, devotedness to the anthropocentric view has gradually diminished. More often, the inconsistency of anthropocentric assumptions and the need for a transition to a new understanding of ecocentrism have been emphasized in literature (Barry, 1988, 1999; Fox, 1995; Gang, 1989; Salite, 1998).

Furthermore, the evolutionary trend in the development of cognitive and mental structures has been broadly examined and discussed, featuring a gradual shift from ecocentric to anthropocentric thinking recognizable both in the development of humankind and the consciousness of an individual. Recently the mission of education to provide a learning environment that ensures coherence between individual consciousness and the evolutionary essence of ecosphere as well as the disengagement from the anthropocentric biases has been frequently admitted (Neville, 1999; Siliņš, 1999; Barry, 1999). To protect anthropocentrism, attempts to add ethical aspects to this view have been made, however, sustaining a purely anthropocentric view tends to perpetuate the problems caused by this trend (Rowe, 2001). In addition, the exposition of several fallacies connected with interpretations of the concept of sustainable development and consciousness of ecosphere (Filho, 2000; Rowe, 2001; Hutchinson, 1998) increased, consistently bringing evidence that, in the consciousness of society, anthropocentrism and ecocentrism play mutually complementary roles. More scrutinized analysis of the introduction of concepts of sustainability or sustainable development shows that these concepts actually have been suggested on the grounds of anthropocentric assumptions.

In a mean time, the recognition of ecocentrism has gradually been increasing. Although, the early stages of exposition, discussions of ecocentrism were considered unworthy and unscientific, currently it is applied in holistic theory within education as one of its contexts and tools. Ecocentrism was gradually introduced and has found its place in holistic ecology (Odum, 1950). From point of view of deep ecology, ecocentric views have been included in ecophilosophy, and initiated the development of ecopedagogy and ecopsychology. Even though ecocentrism implies respect, humanity, responsibility and care, it does not necessarily have an antitechnological orientation. Ecocentrism features the discovery of the deepest foundations of sustainable development in the context of evolutionary processes of humans in the ecosphere. As a result of these cosmological processes the Earth, ecosphere, diversity of species, human beings as a species among the species were created. Processes of cosmological self-development and self-organization have changed and currently they have taken a new direction: toward the development of consciousness and spirituality manifested in the ability of human beings to create and to sustain the diverse relationships with other species.

Altogether, these changes in perceptions have determined the challenge for a pedagogical theory to produce new curriculum that is not grounded solely on anthropocentrism.

It could appear that the shift toward ecocentrism has been initiated. However, a deeper look into the evolutionary and historical experience of both trends encourages the observation that the principle of complementarity is the main point. Many argue that anthropocentric thinking has to be included into aims of higher levels of learning or that possibilities to complement anthropocentrism with the ecocentrism have to be looked for in educational programs. In this regard Rowe (2001) suggests that the “law of levels” articulated by Feibleman (1954) should be considered. It should be assumed that the aim (in this case it is an aim to educate for sustainable development) has to be derived from the higher level, within the context of the ecosphere (from ecocentrism), but the mechanisms of realizing the aim have to be searched for in anthropocentrism (lower level).

This suggestion helps to leave behind the dominating anthropocentric view or, at best, anthropocentrism is improved with ethical assumptions. It has been further suggested that education has to take care of two kinds of needs derived from the context of ecosphere. Firstly, there is the need humans have to learn to satisfy themselves in the status of human beings as a species among other species. Secondly, there are the needs human beings have to learn to satisfy to survive as a species (Barry, 1999; O’Sullivan, 1999).

Both kinds of needs are essential and their coordination is the task of contemporary education, which reaches for the goal of sustainable development. Therefore, if the aim of education is perceived in the context of anthropocentrism, we can understand it as a wish to develop a human being toward the certain results: traits or types of action. These may include knowledge or the ability to analyze and control processes and situations essential for the satisfaction of the seemingly endless needs of human being as a species. This is the orientation to the growth of competitiveness, increasing implementation of new technologies and scientific discoveries, as well as the monitoring of the state of environment and the conviction that human beings are able to control all the processes in the world.

Analysis of the aim of education in the context of ecocentrism shows that the main precondition for the existence of all types of life and human being is the psychological coalescence with the ecosphere.

Education that adopts ecocentric views stimulates people to join in the ecosphere, and fosters the development of human being as the spiritual dimension of ecosphere. Such education also promotes the actualization of human capacities and encourages the evolution of consciousness in the Universe (Whitehead, 1967).

Given the definitions and discussions mentioned above, the action research to be described was initiated to discover approaches Daugavpils University students may take to define the aim of, and their assumptions regarding, education for sustainable development. The case study was selected as a method to obtain a picture on the approaches of university students (full-time and part-time) to the definition of aim of education, and the most typical values and principles offered as a basis for the education for sustainable development.

The research tasks selected consider the gradual changes in attitudes to anthropocentrism and ecocentrism as they have developed in the last decades.

### **Methods and assignments of the case study**

The research sample group consisted of 259 part-time (in-service teachers) and full-time students enrolled in preschool and primary school teacher training programs. These were divided into 49 work groups.

The case study was intended as one of the tasks within the action research initiated with the goal of reorienting teacher education towards the aim of sustainable development in Daugavpils University.

The assignments were included in practical classes of the study course named “Environmental Education”. The students received two assignments to articulate the aim of education for two different tendencies. In the third assignment the students were asked to choose the principles for “education for sustainable development” (without the concept being explained before the exercise). In Latvia the initial translation of concept ‘sustainable development’ was closer to the concept of coherent development and only the recently this meaning has been transformed into the ‘long-term development’. Therefore, the concept as it has been used internationally is not habitual in the public circulation and school curriculums have not introduced this concept yet.

The assignment was completed through cooperative work in groups, within the methodology of a workshop. The reports submitted by the groups provided the data for the qualitative analysis. The reports contained the most essential definitions created by the groups according to the instructions.

### **The content and instructions for group work**

In the first two assignments the students were asked to answer the question “What is good education?” The answer was to be found by defining the aims, principles and expected results of this education.

Each assignment was supplemented by different instructions determining the search for the aim of education.

The instructions of the first assignment asked to focus merely on one essential feature sustained by education, i.e., on the ability of human beings to create and maintain a diversity of social relationships such as individual to group; group to group; and different groups to global society.

The instructions of the second assignment asked to define the aim, principles and expected results of education conceived in a wider context of cosmological processes of self-development and self-organization.

By means of these assignments the students engaged in the research become acquainted with the two different views on the aim of education. These views conditionally can be called: education for “the human beings as a species, emphasizing the context of social relationships,” in the first assignment and education for “the human beings as a species among the species” in the second assignment, stressing the context of ecosphere. As the titles for the cases, terms suggested by O’Sullivan (1999) were adapted.

### **Results**

The analysis of results was performed focusing on the:

- 1) distinction of approaches to the definition of educational aim;
- 2) determination of the most essential views implied as arguments for the interpretation of each approach;
- 3) detection of the most typical views on education for sustainable development and its features.

For the purposes of evaluation, the context of anthropocentric and non-anthropocentric assumptions was introduced. This was a point of reference for the different approaches to the definition. Several groups of views featuring the specific approaches were obtained. The following exposition will provide a brief summary of results acquired within each approach.

#### ***Approaches to the definition of aim of education for the “human being as a species”***

As it was mentioned above, the groups of respondents were asked to elaborate the common view on the aim of education considering the essential feature of human species: ability to create and sustain the diverse mutual relationships.

Analysis of results indicated three specific approaches to the definition of the aim of education:

- 1) orientation to the indication of the preferable result;
- 2) orientation to the creation of environment for development;
- 3) orientation to the distinction of dispositions imperative for education.

**Approach 1 – ORIENTATION TO INDICATE THE PREFERABLE RESULT**

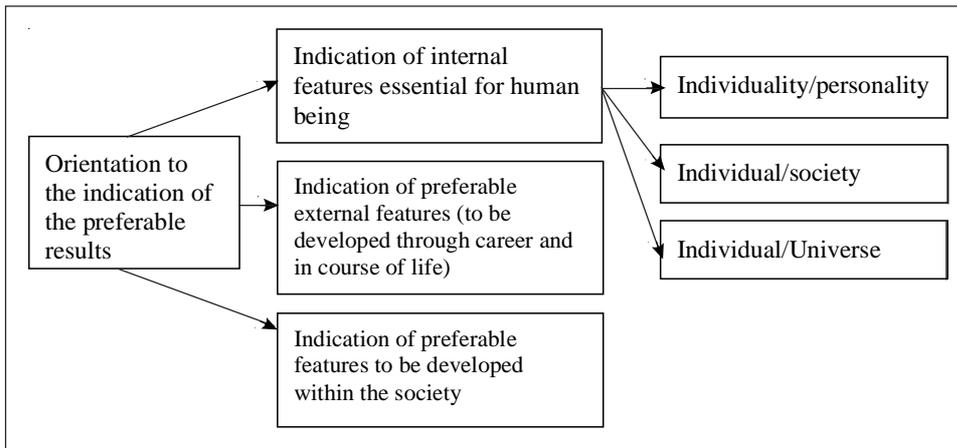


Figure 1. Range of answers obtained within the approach “orientation to the indication of the preferable result”

Obtained types of answers suggest that as a background for the definition the anthropocentrism and egocentrism were sought. Only one answer enhanced the context, mentioning the links with the Universe, and, therefore, complemented anthropocentrism with a cosmological context.

**Approach 2 – ORIENTATION TO THE CREATION OF ENVIRONMENT FOR THE DEVELOPMENT**

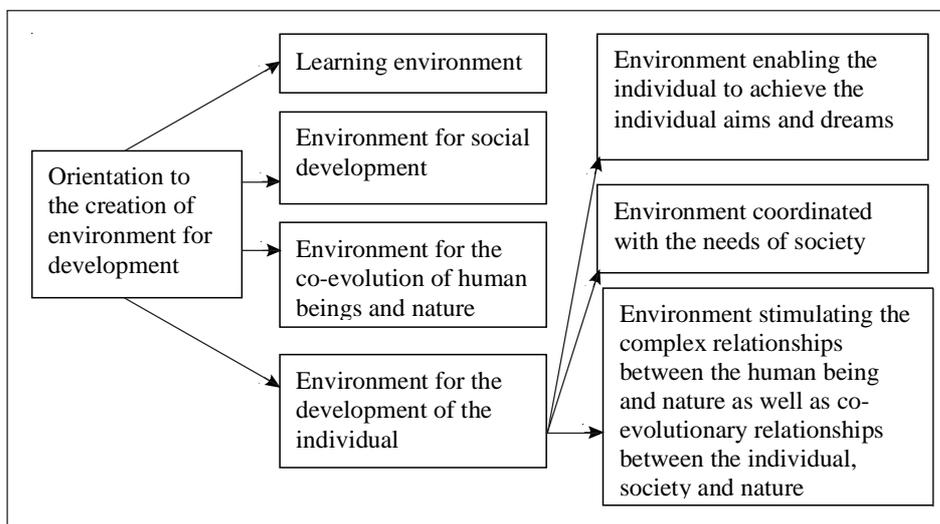


Figure 2. Range of answers obtained within the approach using “orientation to the creation of environment for development”

Within the second approach the definitions were articulated in the context of environment created for development. These definitions are more ecological and sensitive to the coevolution of human/nature or to the ecological anthropocentrism.

**Approach 3 – ORIENTATION TO THE DISTINCTION OF DISPOSITIONS NECESSARY FOR EDUCATION**

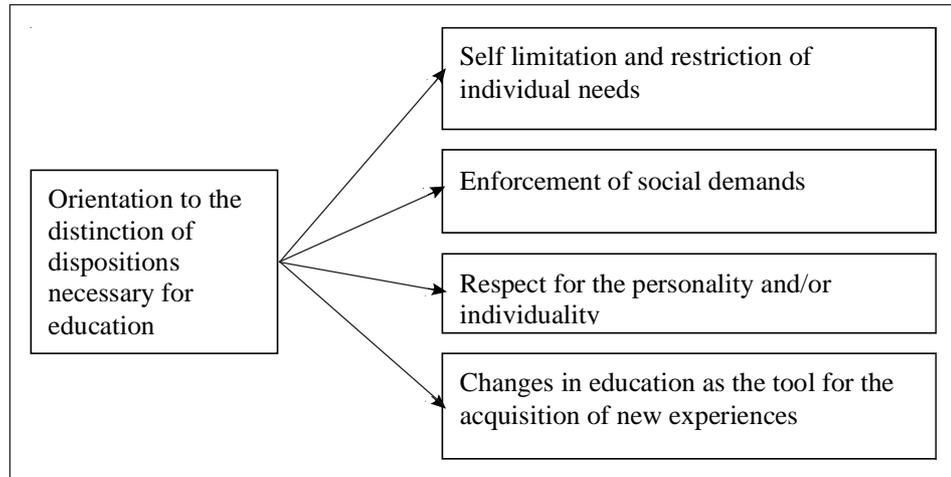


Figure 3. Range of answers obtained within approach “orientation to the distinction of dispositions necessary for education”

Within the third approach the responses of groups were oriented to the standards both individually accepted and determined by the interests of society. These standards were proposed as the anthropocentric suggestions with a tendency towards a limitation of anthropocentrism.

***Conclusions about the types of approaches to defining the aim of education for the “human being as a species”:***

- Qualitative analysis in the context of anthropocentrism or non-anthropocentrism showed that the anthropocentrism and egocentrism were used as a background for the definition within the three main approaches to the definition.
- The views grounded in a broader context, which included connections between the human being and the Universe as well as limited anthropocentrism were also observed.
- Interpretation of aim focused on the creation of environment for development was more oriented toward the co-evolution of human being and nature or ecological anthropocentrism. These interpretations were more ecologically oriented.

***Approaches to the definition of aim of education for the “human being as a species among the species”***

In this case, the groups of respondents were asked to elaborate the common view on the aim of education, while considering the essential feature of human being as a species among the species maintaining the ability to create and sustain diverse relationships with other species in the ecosphere.

Analysis of results identified four specific approaches suggested by respondents:

- 1) orientation to the indication of the preferable result;
- 2) orientation to the creation of environment for development;
- 3) orientation to the distinction of dispositions imperative for education;
- 4) orientation to the character of activities in pedagogical process.

Suggested features were evaluated in the context of anthropocentrism and non-anthropocentrism.

**Approach 1 – ORIENTATION TO THE INDICATION OF THE PREFERABLE RESULT**

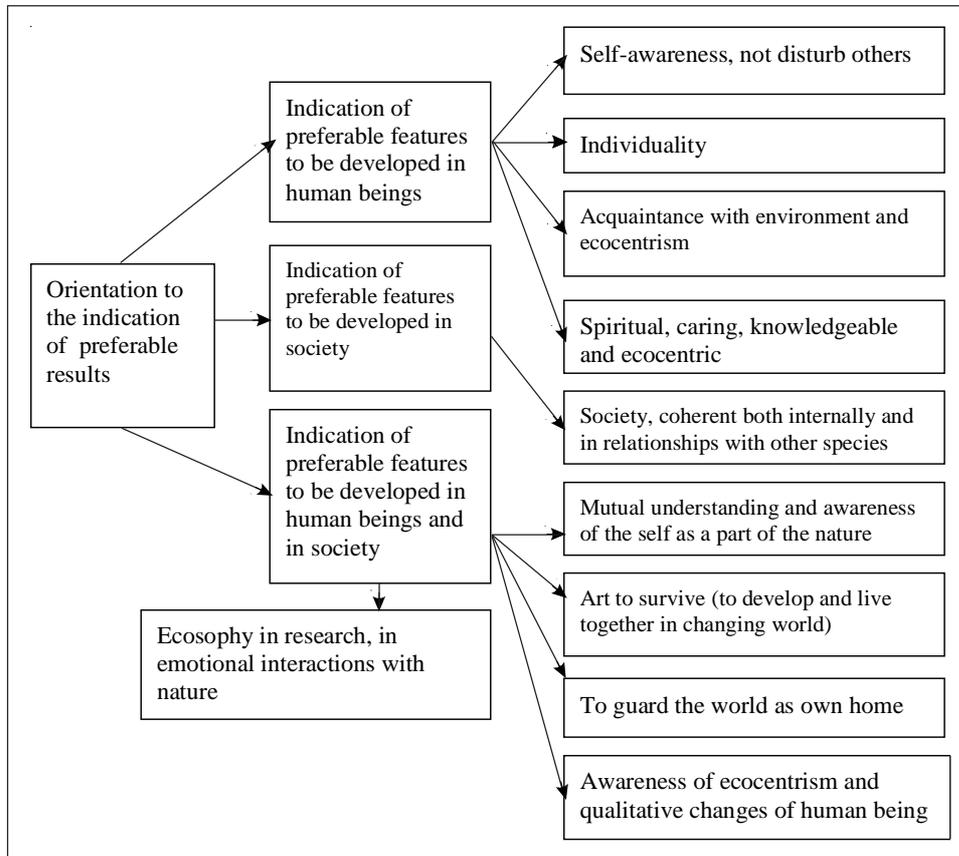


Figure 4. Range of answers obtained within approach “orientation to the indication of the preferable result”

Student answers reflected in Figure 4 contained articulation of aims within the boundaries of anthropocentrism and interpreted this aim through the features of ecocentrism and anthropocentrism.

**Approach 2 – ORIENTATION TO THE CREATION OF ENVIRONMENT FOR THE DEVELOPMENT**

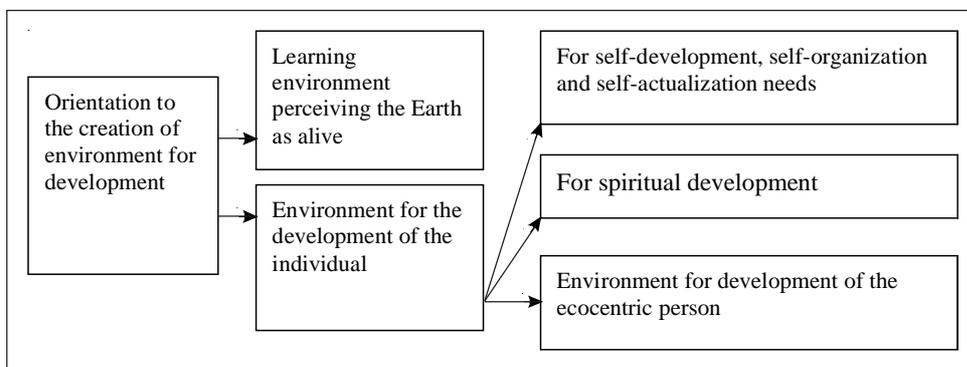


Figure 5. Range of answers obtained within approach “orientation to the creation of environment for the development”

As a background for this approach the principles and features of the distinct ecocentrism were implied.

**Approach 3 – ORIENTATION TO THE DISTINCTION OF DISPOSITIONS NECESSARY FOR EDUCATION**

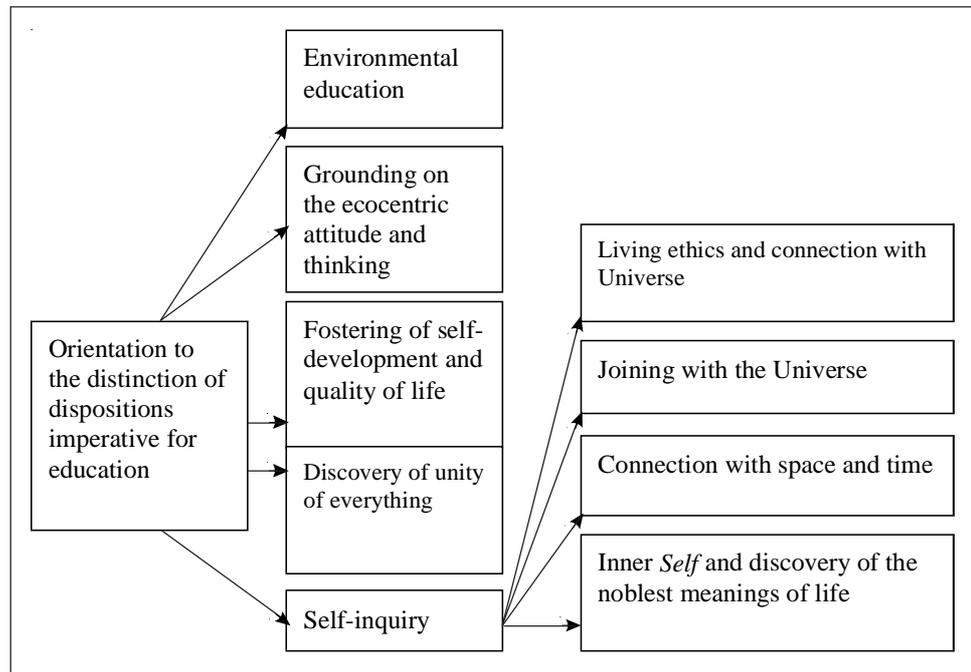


Figure 6. Range of answers obtained within the approach of “orientation to the distinction of dispositions necessary for education”

Within this approach to the aim of education, the extended anthropocentrism and the foundations of ecocentrism were utilized.

**Approach 4 – ORIENTATION TO THE CHARACTER OF ACTIVITIES IN PEDAGOGICAL PROCESS**

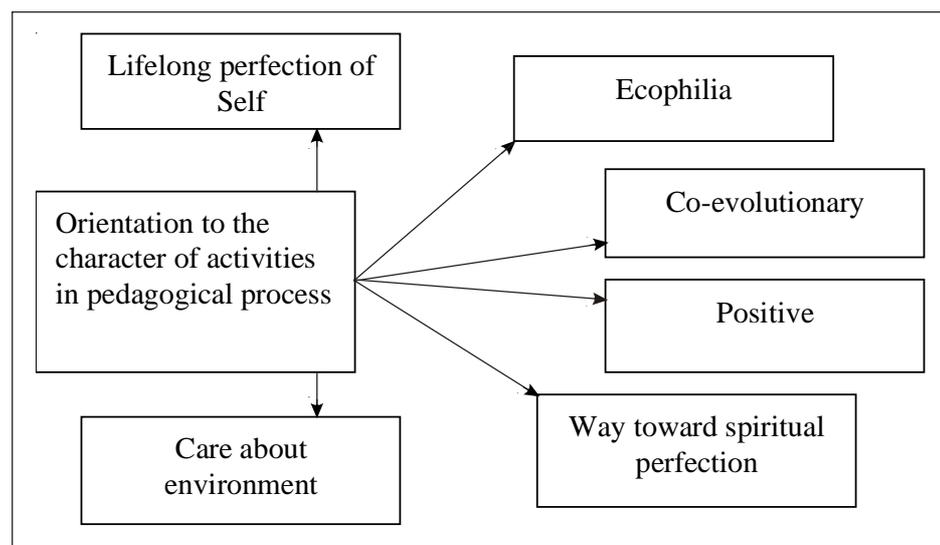


Figure 7. Range of answers obtained within approach “orientation to the character of activities in pedagogical process”

Implementation of anthropocentrism and ecocentrism is related to certain complex phenomenon (process). The tendencies towards co-evolutionary interactions, complementarity of anthropocentrism and ecocentrism, spiritual and lifelong perfection have been discovered in the answers.

***Conclusions about the types of approaches to the definition of aim of education for the “human being as a species among the species”***

- Qualitative analysis in the context of anthropocentrism and non-anthropocentrism showed that ecocentrism was used as a background for the definition in those cases where the aim was comprehended in the context of spiritual development of human being or human kind. Formulations of aim implied that interests broader than the interests of human being as a species were grounded in the joining of anthropocentrism and ecocentrism.
- Approach to the definition of the aim of education “orientation to the creation of environment for the development” was more promising as it involved the deeper and wider context of ecosphere, in this case being based directly on ecocentrism.

***Selection of the most typical views on the education for sustainable development and its features***

Data obtained from the reports of 49 work groups (N=259) provided the general picture of three well discernable approaches to the selection of principles of education that aims for sustainable development.

- 1) Frequent and diverse references to anthropocentrism were observed. In all cases where the principles for education for sustainable development were grounded on anthropocentrism, the different varieties of anthropocentrism, endowed with the various features including ethical, holistic, tolerance, care, respect, spirituality, biocentrism, emotions were used. The views in this group of answers were mostly orientated toward the implementation of cultural potential, development of individual features, as well as the connection and succession of generations. In the rich diversity of features and varieties of anthropocentrism the range from egocentrism to biocentrism can be discerned. In the cases where education for sustainable development was perceived as being grounded on anthropocentrism, the most typical features of ecocentrism were not employed.
- 2) The references to anthropocentrism and ecocentrism for the purposes of interpretation of education for sustainable development were less pronounced. The comments for this group included terminology such as ecocentrism, ecology, living ethics, connection with the Universe, coevolutionary character of development, culture and identity, awareness of the bounds with other species, spiritual development, care and the task of nurturing of ecological human being. Within the wide collection of features, an attempt to strive towards ecocentrism, though not entirely consistently, was noticed. These interpretations feature ecocentrism as a stable feature, as the supplement to anthropocentrism.

- 3) The references to ecocentrism were observed in three interpretations of education for sustainable development. The aim of education is grounded on the context of ecosphere embracing the ecological “self” as an ecological identity complemented with an ethnic identity.

### Summary

Qualitative analysis of the results obtained in the first two assignments shows that the different instructions determined the tendencies toward the different views.

Approaches that focused on creating an environment for sustainable development provided the deeper ecological context. In the first assignment it was interpreted by ecological anthropocentrism. In the second assignment this approach was applied in the context of ecocentrism and comments were made from the point of view of ecocentric features.

These approaches to the aim of education can be viewed as general structures applied by the participants of action research to articulate the aim of education. The investigation of the foundations of these structures in the context of anthropocentrism/ecocentrism can help to evaluate the ecological potential of these structures.

The approaches to the aim of education, determined through this analysis, can be applied in further tasks of action research. These approaches can be subjected to critical evaluation by individuals to help them distinguish their own deepest ecological values in the context of education for sustainable development.

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# *An Inquiry-based Model of Professional Development for Environmental Education*

**Carol Fortino**

## **Abstract**

*This paper describes the pedagogy and praxis of a two-day Environmental Education workshop held at the University of Daugavpils, Latvia, in August 2001. Current training models ask participants to “sit and get” information about standards-based curricular topics, such as water. A better model for adult personal development is to foster inquiry into a topic while participants build a professional community. Project WET (Water Education for Teachers) is a non-profit, international, supplemental environmental education program for K-12. The workshop features water-based activities that have curricular links to science, mathematics, health, language and culture studies. Topics range from water’s chemical and physical properties to ecosystems and human management strategies. Benefits for participants include: connections with a local cohort of environmental educators; meeting someone more experienced who can become a mentor; becoming part of an international network through the Project WET website; and acting as future leaders for environmental education.*

*Key words:*

*environmental education, professional development, inquiry, mentoring, curriculum*

## **Introduction**

This paper argues that an inquiry-based model of professional development can help foster future leaders for environmental education. It describes the pedagogy and praxis of a two-day Project WET (Water Education for Teachers) workshop held at the University of Daugavpils, Latvia, in August 2001. Project WET is a non-profit, international, supplemental program for K-12 that is predicated on the understanding that Environmental Education is a field requiring not only awareness and knowledge, but eventual action. Our current models of professional development often ask participants to “sit and get” information about timely topics, such as water, which is a curriculum area required for content standards in many countries. A better model for adult personal development is to foster inquiry into a topic while participants build a professional community. When these self-activated participants return to their educational setting, they will be able to encourage their students in the processes of inquiry. Importantly, they will have built for themselves a professional network to support them as they lead their students to responsible action. The water education activities are hands-on, easy to use and fun. A Project WET workshop invites participants to inquiry into the topics that have curricular links to science, mathematics, health, language and culture studies. Topics range from water’s chemical and physical properties to ecosystems and human management strategies. Upon

completion of the workshop, participants are connected with a local cohort of environmental educators; they may meet someone who can become their mentor; and they can become part of an international network through the Project WET website.

### **Background**

I met Dr. Ilga Salite, the Dean of Pedagogy and Psychology from the Daugavpils University, Latvia at a 1995 International Environmental Symposium hosted by Dr. John Fien in Brisbane, Australia. We continued our contact when I became a professor of science education at the University of Northern Colorado, USA. This led to an invitation to present a Project WET (Water Education for Teachers) workshop in August 2001. The workshop was conducted in English and supplemented by written materials. Without the generous and careful work of my translators Dr. Anita Pipere and Ilze Buķbika, I could only demonstrate activities about water. However, with their help, more authentic group communication could take place about the pedagogical and philosophical underpinnings for learning and teaching about this environmental issue.

### **“Sit and Get” Workshops**

There are several choices for designing a workshop. One of these features the “expert presenter” model of staff training which has become equated with professional development. The facilitator selects the objectives, learning activities, and training. The goals for this type of workshop typically include awareness, knowledge, and skill development, while the outcomes are related to changes in attitude and transfer of training. In order to accomplish this model, “executive control” needs to be kept by the facilitator while participants explore theory and demonstrate practice.

These kinds of workshops “can be either very fulfilling or disparaged as ‘sit and get,’ ‘roundup’ sessions that leave people feeling overwhelmed with information or given too much theory and not enough application (Sparks and Loucks-Horsley, 1989)”.

### **“Inquiry-based” Workshops**

A preferred choice for planning a workshop involves a model where educators are allowed to follow a process of inquiry, either individually or in small groups. They identify a problem, in this case – water education. They consider data from research or classroom-based action research, analyze the activities, and come to logical conclusions about the best course of action. The model rests on the assumption that the mark of a professional is the ability to take reflective action (Eisenhower National Clearinghouse, 1999).

### **Building a Community of Learners**

An inquiry-based Project WET workshop can accomplish many of the vital signs for group professional development according to criteria adapted from Hunter, Bailey, and Taylor (1995). This pedagogy posits that teams, partnerships, and col-

laborative enterprises like workshop groups can be fragile structures. This is especially true, if the group's participants range from pre-school teachers to university professors as it was at Daugavpils. This section will endeavor to explain how the Latvian Project Wet Agenda met several of these criteria during the inquiry-based workshop.

- A. *Sense of Purpose. The group has clear goals and the group members are committed to achieving them.*

The Project WET workshop began with the theme *WATER EDUCATION INVOLVES A VARIETY OF TEACHING STRATEGIES* and two activities called "Water Log" and "Idea Pools". The first activity engages the adult learners in recalling their own special relationship to water by drawing their favorite place, then by drawing an idea they feel is important for their students to know. This duality of thinking is important. If one is engaged in an idea as an individual, it is easier to excite one's students as a teacher.

The second activity asks teachers to list on sticky notes several ideas about water that they know students must learn while in their class. These notes are then arranged on a poster board by content similarity with circles drawn around them to form "pools" of ideas. These ideas typically are appropriate across grade-levels. Participants generate titles for these larger groupings and list them on the poster. Although the "expert" facilitator has a planned agenda, it is important that it is not set in stone so that the audience's goals for inquiry can be incorporated into the workshop.

- B. *Powerful vision. The group can express its vision for teaching and learning in words, art, or music. The vision serves as an ongoing inspiration to group members when the going gets tough.*

A variety of activities need to be presented during a workshop in order to honor the various learning styles of the audience. Some may need a personal buy-in to understand why this professional development workshop is important for them. Others may only want facts and figures, which they will process abstractly. A third type of learner may need the hands-on aspects of inquiry that are more than a technician's role that only requires following a set of directions with a pre-determined outcome. A fourth type of learner may already be thinking "what if?". These learners are planning ahead for their own teaching ideas while concepts are still being formulated within the workshop. According to the 4-Mat Learning Styles (McCarthy, 1995), these four different types of learners are important contributors to the group's vision, each bringing an important and needed perspective. This pedagogical approach matches well with Project WET's goal "to accommodate diverse learning styles with activities that are not only practical but also thought-provoking and engaging".

The Latvian workshop allowed educators to inquiry about important water themes. They could then express their learnings about various activities using their own language, music, art, and creative dramatics. The agenda included:

*WATER CONNECTS ALL EARTH SYSTEM*

"The Thunderstorm" – simulate the sounds of a thunderstorm and create precipitation maps from collected data.

*WATER IS A NATURAL RESOURCES*

“Molecules in Motion”; “Water Cycle” – demonstrate molecular motion through creative dramatics

*WATER RESOURCES EXIST WITHIN CULTURAL CONSTRUCTS*

“Raining Cats and Dogs”; “Water Sayings” – discover how water proverbs vary among cultures and climates, including regional Latvian stories and proverbs

“Rainstick” – build a musical instrument that imitates the sound of rain.

- C.** *Clarity of roles and responsibilities. The group uses ground rules and designated roles to manage its meetings, and makes expectations and limits for work performance clear.*

It is important in adult professional development that enough time be given for educators to complete some work and not be rushed from activity to activity. This is why a two-day format is preferred. For example, on Day One participants inquired into the theme *WATER IS A NATURAL RESOURCE*. They then engaged in the activity “Water Address” to analyze clues to match organisms with water related adaptations. They personalized this learning by writing, in Latvian, scenarios about water, plants and animals. At the end of the day, one participant, a professor of Biology, collected all of the drawings and writings. That night he typed and scanned them into his computer and the next day participants went home with 25 ready-made, local examples. No amount of planning on the part of an expert facilitator can anticipate the goodwill of a cohesive workshop audience. This group took it upon themselves to come back the next day, not only with required materials, but also with additional books, stories and resources to share among themselves.

- D.** *Projects as a way of life. The group organizes its work around projects that bring diverse individuals together to achieve specific objectives.*

When working with a diverse audience, it is important that the whole group be allowed to reorganize around self-determined levels. This was demonstrated while inquiring into the theme *WATER RESOURCES ARE MANAGED*. The activity, “Common Water” demonstrated that water is a shared resource and included two story lines, one appropriate for pre-school and elementary and the other for middle and high school. The interactive stories describe the inhabitants’ use of water, while a bowl of water becomes polluted and depleted, thereby helping the audience to visualize the consequences. The grade-level groups discussed how this activity could become a springboard for extended research projects.

- E.** *Group Identity. Collaboration serves as a catalyst for forming a new identity.*

Beside the sampler of materials given out at the workshop, each participating school or university department received a complete Project WET book. It is hoped that this added resource would be a catalyst for a group identity of Project WET teachers in Latvia. If their enthusiasm for the materials and professional development grows, they could facilitate similar workshops for their colleagues.

- F.** *Communication. The group finds ways to work through conflict rather than avoiding it. Conflicting views are considered normal. People agree to communicate with each other even when it is hard.*

A facilitator can unintentionally forget certain details when working in a foreign country; this can be embarrassing or helpful depending on the way the group communicates. I was pleased to have a workshop participant point out that my water data was incorrect because I had used the American comma to separate millions and hundreds instead of the European decimal. The difference gave us a good laugh and opened the door for further audience participation.

Another highlight of communication occurred while doing two activities: “Adventures in Density” – an experiment with density and “H<sub>2</sub>O Olympics” – a cooperative game to investigate adhesion and cohesion. The professor of physics volunteered a quick mini-lecture to review the theme *WATER HAS UNIQUE PHYSICAL AND CHEMICAL CHARACTERISTICS*. This kind of spontaneous camaraderie and communication can only take place when a group of adults is engaged in inquiry rather than a formalized training session.

**G.** *Continuous Learning. Members of the group are continually learning – individually, in pairs or small groups, as a whole team. The group takes time to debrief its processes, experiences, and events. The whole group engages in program monitoring and evaluation.*

Many strategies were demonstrated in this workshop. However, a strategy is not the point of learning. A strategy is a tool, a systematic way of going about things, an artificial scaffold to help access material that would otherwise be inaccessible. It is assumed that at some point, the scaffolding can be removed and the brain will process the ideas efficiently, thus allow for making meaning.

It is the meaning participants make about water education that is important for Project WET. In order to evaluate this workshop a short questionnaire was administered and the feedback was helpful for planning future sessions. One question asked was, “Do you plan to integrate these activities into your curriculum?” The majority of teachers responded positively adding that the materials would “facilitate the visual thinking and abilities of students” and that the curriculum was useful for boarding school teachers or for student research. One university professor mentioned its use for biology demonstrations, especially at the end of the semester when students already have their grades but need to be engaged in interesting work.

However, most important was the list of contacts – addresses and emails for continued networking. Internationally, Project WET can be accessed through its website-<http://www.ProjectWET.org>. This communication link helps generate enthusiasm for further, more in-depth study of the topics introduced through the workshop activities.

### **Sustaining the Effects of Professional Development through Mentoring**

Mentoring has been found to be an effective way to encourage the professional development of leaders in the field of environmental education (Fortino, 1997). An inquiry-based workshop offers the time for community building so that mentor/mentoree contacts can be made (Zagumny, 1993). A personal and professional mentoring relationship can develop where the mentor has expertise, such as teaching about the environment, and a mentoree has pedagogy and praxis yet to learn.

No matter at which age or stage of one's career that he/she becomes a protégé, "mentoring is a powerful system for making progress" (Segerman-Peck 1991: 13).

An effective mentoring relationship can have a positive impact on a future leader's career in environmental education allowing him/her to debate and develop a philosophical approach to that career. A novice can grow professionally along side, and not subservient to, the mentor. It is important that teachers new to water education be personally nurtured and sustained as he/she continues to act in the field of environmental education which is known for its controversy. Research has shown that effective mentors and mentorees seek out one another. For the participants who attended the Daugavpils workshop, mentoring connections can be nurtured in several ways:

1. an e-mail list can be set up for participants to share their successes of Project WET activities and to show how the materials have been localized for their educational setting; advice can be sought and help can be given through the immediacy of internet exchange with the American facilitator, the University professors and new contacts on the international website;
2. those who indicated that they wished to become facilitators for Project WET can meet together with one of the university faculty to continue their training;
3. teachers who are new to environmental education may have met someone at the workshop whom they wish to emulate and they can seek further contact to ask advice, to find out about new opportunities, and to discuss their philosophical approach to teaching water-based issues.

In summary, a Project WET workshop can be the vehicle for inquiry into the vital topic of water. It can be an opportunity for professional development, which can create a community of adult learners. This setting can be a crucible for the meeting of mentors with mentorees who can develop into new environmental leaders. Project Wet themes and activities can engage students at the school, university and community levels. Because water connects living organisms and non-living systems as it sustains all of our Earth systems, it is a topic not only important in our educational curricula, but also in our personal lives. Learning and teaching about water touches our past, our present and our future.

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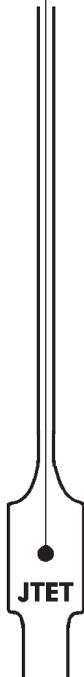
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# *In-service and Pre-service Teacher Training to Address Sustainability in Brazil*

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## **Abstract**

*The “ProAR” Project team is promoting in-service and pre-service teacher training to address sustainability through an issues based program that activates awareness and direct participation in local community health problems. Communication is the main strategy and interdisciplinarity is the main tool. The aim is to improve the teachers’ performance and working conditions through support of university researchers and Ph.D. teachers in order to enable the teachers to face the new tasks of Environmental Education for Sustainability, according to the recommendations of the Agenda 21 by UNESCO. The project was commenced in 1995 with the objective to promote the social awareness in order to change the air quality policy in the city of Curitiba/Paraná in Brazil. The project has activated teaching, research and extension in the Federal University of Paraná and the local community, involving undergraduate students, elementary school teachers, their pupils and families.*

*Key words:*

*environmental education, teacher training, sustainability, interdisciplinarity, air pollution, community awareness.*

Protection of the environment and preservation of ecosystems are usually considered a subject-matter of a few university courses like Biological Sciences and Geography, and they represent just a small part of the curricula. Traditional courses did not approach the environmental problems integrating social, economical and ecological aspects. Therefore, the task of greening the university is not easy, and neither is the greening of the city. Thus, the adoption of a project based approach is the starting point, and air pollution is the priority, because the municipal administration of Curitiba denies that there is pollution and such a policy is contributing to the damage of population health.

Communication and elementary school teacher training to address Environmental Education for Sustainability are the main strategies to rise the awareness of the local population of such environmental problems, to motivate them to participate in the environmentally correct actions, to improve living conditions, to preserve health, as well as to introduce the concepts and procedures of “sustainable development”. According to the UNESCO Programme of the Commission on Sustainable Development: Education, Public Awareness and Training and Chapter 36 of Agenda 21: “For formal education, the implementation of the recommendations contained in chapter 36 to ‘reorient education towards sustainable development’ coincides with a broad rethinking within many countries of their formal education systems, which

are no longer considered adequate to meeting the needs of today's society and the workplace" (Hopkins, 1996).

Environmental Education, according to the Brazilian national curricula and the PRONEA (*Programa Nacional de Educação Ambiental*), is not to be taught like a traditional "*discipline*" in elementary schools. It has to be introduced in the curricula as the "*transversal themes*", with interdisciplinary approaches and active participation of the pupils. However, the in-service teachers were not prepared or trained to do this. Their university programs were not oriented to environmental studies, sustainability or interdisciplinary approaches. And these approaches have not been effectively implemented in the teacher education courses of most universities up to now.

There is a gap in elementary school in terms of environmental topics and teaching of sustainable development. University teachers should be invited to fill in this gap by promoting in-service and pre-service teacher training. However, majority of postgraduate teachers are devoted to the studies of what are called pure sciences and the environment is not considered a relevant subject. Perhaps this is a sign that the university teachers are not prepared to face the environmental problems and sustainability, too.

On the other hand, there is demand for synchronized social, environmental and economical development. Progress is the most desired achievement of a city administration, which implies increasing the numbers of industrial plants, vehicles and, thus, increasing gas emissions and air pollution. Unfortunately, the population of Curitiba – Capital City of the State of Paraná, is not informed about the danger of air pollution or about the price that every citizen will have to pay for that progress in terms of health. The policy of local government is directed toward the attraction of more investments and is inviting more and more industries to build new plants here. Meanwhile, the statistics of the Secretary for Health Care reveal that respiratory system diseases are the first in the ranking of morbi-mortality statistics all over the city. Thus, the monitoring of the air quality is a positive context to promote the community awareness and cooperation directed to sustainable development.

### **Introduction**

The Project "ProAR" – Air Quality Monitoring: Evaluating & Educating" has developed a new and inexpensive methodology to promote Environmental Education for Sustainability by means of issues based strategy. Every year, since 1995, the program has been started with a teacher training course activating a cascade effect. The participants, elementary school teachers, are trained to work in an interdisciplinary setting, and to transfer to their pupils the new knowledge about the pollutants and their malefices to the human health and environment. In the next phase, the young students perform research or air quality monitoring in the schools for four weeks. Besides the teaching and research phases, there are some extensional actions, when the children have to multiply or to share the knowledge with the family. They take home a leaflet and teach their parents "what to do in order to reduce air pollution". The teachers also learn how to make use of communication strategies in order to inform and promote population awareness and change of behavior, by means of multiplying and disseminating the didactic material (prepared by the project coordinators), organizing seminars, fairs and other events, as well as undertaking some attempts to affect the policy of the local government.

The research studies developed by the “ProAR” team in 1995, 1996, 1997, 1999, 2000 and 2001 have demonstrated that Curitiba, like other capital cities with more than 1.7 million inhabitants, is contaminated by ozone, one of the most aggressive pollutants to human health and environment. When “ozone” is found in the low atmosphere, it is a sign that several other pollutants are also present, since the ozone is a secondary pollutant resulting from the sunlight interaction with a combination of nitrogen oxides and hydrocarbons.

According to international methodologies, the “ProAR” project team has adopted the ozone as an indicator of air pollution and is measuring its concentration for eight hours, during four weeks, usually in August. In several countries the evaluation of ozone (O<sup>3</sup>) concentration is used as a parameter for the air pollution measurements, and according to Mariano & Kirchhoff (1992) “the Brazilian legislation determines that the maximum concentration of ozone cannot surpass the limit of 80 ppb for one hour reading. Such recommendation is similar to the patterns of other countries and is not a limit of maximal concentration only, but implies that such concentration is maintained in time, during one hour. This concept considers that the human exposition to a toxic gas has to be measured not only for its concentration, but also for the integral concentration in time. Thus, it will have the same effect if someone is exposed to 100 ppb of ozone during one hour or to 200 ppb for half an hour”.

## Materials and Methods

A simple methodology with alternative devices enables the conduction of the air quality monitoring by the elementary school students supervised by their teachers. A wooden pedestal with the research kit is installed in each school. The kit consists of (1) the Eco-Badge monitor for the ozone concentration measuring, (2) a plastic bottle with a funnel to collect rain water to evaluate its acidity, using a color filter – pH fix, and (3) a bioindicator – a vase with a plant “*nicotiana tabacum*”, to observe the effects of particles deposition on the leaves, generating “*clorosis*” and “*necrosis*” (confirmed by amplified photographs of a reading/scanning process in the electronic microscope of the university). The alternative device to monitor the ozone concentrations is the Eco-badge (produced by Vistanomics, USA). It contains a paper filter chemically treated to react in the presence of photochemical oxidant (ozone). It changes the color and the graded hues of grayish-brown can be compared to a calorimetric table and values are attributed according to environmental patterns (in ppb).

## Research procedures

The research kits are usually installed in 30 places: 29 schools and one referential place in the university (Chemistry Department). The filters are exposed for eight hours, according to the prescribed methodology for four weeks. For example, in 1999 the monitoring was conducted from the August 9 to the September 3. The teachers and students are trained to collect data. Thus, after the exposition of filters from 8:30 to 16:30 o’clock, every day, they have to compare the color shown on the filter with the colormetric table and to register the corresponding number in the result tables. The “ProAR” team provides all the instructional/didactic materials, as well as the research kits.

## Results

The monitoring process conducted every year for four weeks, revealed some worrying results with the numbers growing every year, demonstrating that “ozone” and particles contaminate the air. Though the most important aspect is the awakening of the population awareness of the importance of clean air for health preservation. Continuity and perseverance of annual educational interdisciplinary activities since 1995 have activated the community participation in changes of the government policy and citizen’s behavior and procedures.

The results of monitoring have revealed a gradual increase of pollution, and a series of city photographs have confirmed this. However, we cannot use these results officially, because the monitoring process is performed only for four weeks and the method is not considered “official”: the Eco-Badge monitor is an alternative device, which is used here because it is the only inexpensive device available. Therefore, besides the economical problems, we have to also deal with political maneuvers. In spite of the natural evidence that the air pollution is significant and is damaging the population health, the city administrators do not want to accept the “ProAR” indicators and they do not reveal the results of their two monitoring stations installed in 1998.

In terms of educational results, the school teachers involvement in the “ProAR” actions is building their teaching capacities and offering them an opportunity to improve their performance in class. As they had not been previously prepared to teach the issues of environmental preservation, the extension course provided by the project is a unique possibility here.

Studies focusing on the effects of air pollution on human health have started recently in Brazil. Only a few articles in magazines of Medicine faculties of São Paulo have mentioned the negative effects of high ozone concentration, as well as their cumulative effects. Then, as a consequence of being pioneers, we have to face another controversy. The local government representatives have alleged that the ProAR numbers are not relevant because we are monitoring for eight hours and the national parameters stated by the CONAMA (National Coordination of Environment Monitoring) Resolution 03/90 just mention the limits for one hour monitoring (the limit is  $160 \text{ ug/m}^3 = 80 \text{ ppb}$ ). On the other hand, studies of the pollution effects conducted by the Faculty of Medicine of the University of São Paulo, as well as the recent publications of the Secretary for the Environment of São Paulo have emphasized that “...human beings exposed to ozone for 6 or 7 hours, even under low concentrations, have their lungs functions reduced, which generates inflammatory diseases in the respiratory system of healthy people...” (SMMA-SP, 1992).

The present methodology using the “ECO-Badge” monitor was tested and is still used by several educational programs at universities in USA: University of Massachusetts, University of Maine, University of California (at Berkeley), Georgia State University, US-EPA – Environmental Protection Agency, Wisconsin Department of Natural Resources, DEP of Maine, Texas Natural Resources Commission, Department of Environmental Protection of Australia, as well as by several industrial plants like Pepsi Cola, Coca Cola, Exxon Oil Co. and Chevron Oil Company. It is internationally known and has been recommended by environmental education specialists like Dr. Jack Hassard, Director of the Global Thinking Program from Georgia State University, who said: “... one of the topics of our project is ground-level

ozone, and we have used the ECO-Badge in Russia, Argentina, Spain, USA, UK, Czech Republic, Finland, Singapore, Australia in conjunction with our work. Through our project I think that many students and teachers have been educated on the problem associated with increasing leveling of ground level ozone and other aspects of air pollution” (Hassard, 2000).

### **Communications**

One of the communication strategies presented during teacher training is the earnest appeal to motivate the population awareness and a call for the citizens’ responsibility towards the air quality of the city. The slogan and the title of the main didactic booklet of the “ProAR” project says: “Health or Pollution: the choice is yours!” Several activities have been developed in schools simultaneously with the research, and the students’ families have been invited to attend seminars, science fairs, arts exhibitions, lectures and some other environmentally responsible actions promoted by the school teachers in their neighborhoods.

Consequently, the education and communication strategies are slowly and gradually affecting the policy of air quality in Curitiba. Though the main result of the “ProAR” Environmental Education process and multiplying effects of teacher training is the efficient induction of new attitudes, behaviors, and environmentally correct actions. But it is a long-term process, and we will have to go on educating the community, in spite of the economical difficulties. There is no financial support to help this educational project. Every year the “ProAR” team invites some schools and they have to pay a small amount as registration fee in order to attend the teacher training course and the research/extension phases, which enables the acquisition of the research materials. But, some schools of very poor regions can not pay that fee, and we would like to get some external support to give them the opportunity to participate, because they are usually situated in the most polluted areas.

### **Historical background**

In 1995, after testing the research methodology with the sampling devices installed in 40 residences of university students, the “ProAR” coordinator looked for a bigger audience, and succeeded in making a kind of partnership with the Municipal Secretary of Education, promoting in-service teacher training through the activities of research/teaching/extension. Thus, in 1996, the elementary school teachers were trained to involve their pupils in the Air Quality Research process, motivating learning and awareness, which was perpetrated by the children, who had to take home some educational leaflets transmitting the new knowledge to their families and neighbors.

In 1997, the multiplying research/teaching/extension methodology was improved and 54 teachers and about 12.000 students shared the results. But, in terms of “communication”, the national recognition of the “ProAR” efficiency came in 1998, when it was selected as a successful Environmental Education project by the National Coordination for EE of the Ministry of Education and presented by a TV network in a national teleconference “Environmental Education in the Air” to all Brazilian public schools.

In 1998, the university was on strike, and the coordinator went to São Paulo to develop a similar teacher training course. In 1999 it was re-edited in Curitiba and

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expanded, with the cooperation of a specialist in Chemistry, Dr. Orliney Maciel Guimarães, and specialist in Botany Dr. Yedo Alquini, who helped us to train 105 in-service and pre-service teachers. The research was completed and in collaboration with the students we carried out the successful monitoring of the ozone level, the acid rain and the pollution effects on plants (*bioindicators*). The project received international recognition and was included in the book “What Works” (Monroe, 1999) edited by AED (*Academy for Educational Development, Washington, USA*) as an effective process of Environmental Education. The coordinator of the project was confirmed as a member of the TEC (*Teacher Education Consulting*), a CSD- UNESCO committee.

In 2000, similar procedures and strategies were performed with positive results, and the project team was selected to test a new device – the “Zikua”. It is the ozone monitor test card reader developed by Vistanomics and the GLOBE Program in cooperation with NASA. The testing phase will go on. It looks really promising and we hope it will be quite useful in a near future. The “ProAR” team got a new collaborator, Dr. Airton Kunz, from the Chemistry Department.

In 2001, the growth of “ProAR” was really significant. Several colleagues, teachers at the Federal University volunteered to lecture about the complementary topics in the teacher training course, like “greenhouse effects & global climate changes” and geoprocessing system for data analyses. The team produced a new edition of the didactic materials, with some new and reviewed topics. The teacher training course has also been amplified to include 118 in-service teachers and 36 pre-service teachers (volunteer university students from several courses). A didactic CD-ROM will be edited soon in order to facilitate in-service and pre-service teacher training for distance education.

Therefore, we do hope that other similar community involvement projects will start some joint activities in the university. These activities will gradually induce the local government environmental policy to change for better, and the “ProAR” team will be able to carry on the integrative interdisciplinary educational process with financial support from any NGO or governmental institution. This support will ensure the involvement of some new participants in order to develop other educational activities and expand the in-service and pre-service teacher training process to address Sustainability. It will gradually enable the implementation of new strategies to motivate sustainable development in Brazil.

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