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Editorial

Journal of Teacher Education for Sustainability (JTEFS) welcomes the authors and Editorial Board on the publication of ninth issue of JTET/JTEFS.

Editorial Board for this issue of journal includes the representatives from 17 countries. I would like to express my sincere gratitude to all the members of Editorial Board and also to the language editors for their selfless work and devotion to the idea of teacher education and sustainability.

The 9th volume of JTEFS contains the contributions from Estonia, Nigeria, and Latvia. The articles represent the multi-perspective – both quantitative and qualitative view on the reorientation of teacher education or professional practice of teaching toward the sustainability and show still insufficient progress toward the implementation of the sustainability principles in education as such and specifically in teacher education in different countries.

The 9th volume of JTEFS starts with the investigation of the relationship between the contemporary humanistic ideology and self-perception of student roles by young people in Estonia. The author concludes that there is no any congruence between the currently desired image of education and the described role of student. Next article explores the present situation with the education policies and teacher education programs in Nigeria in light of the Millennium Development Goals cited in the 2000 United Nations Millennium Declaration. The data suggest that both teachers and school administrators are discontented with the lethargic policies and implementation of programs in meeting global standards. The article by the authors from the Tallinn University depicts the characteristics of sustainable changes for schools. A model of six characteristics of sustainable changes in schools has been introduced in the article and the changes concerning sustainable development in Estonian schools have been analyzed using qualitative research methods. Further, the researcher from Latvia analyses the didactical aspects of integrated natural science content model for secondary school education. The survey on teachers' attitudes towards integrated natural science curriculum and study of pupils' achievements reflects the possibility of promoting scientific literacy of pupils. As the data show, the application of a contextual and integrated approach in science teaching/learning essentially influences the development of high order cognitive skills such as pupils' ability to analyze, create, and evaluate. The next article of this volume is based on a quantitative research aiming to find out the number of left-handed pupils in different classes and the knowledge and skills of Estonian primary school teachers to teach left-handed children. The current volume of journal concludes with an article where the context of sustainable education is used to frame the research on the needs of teacher education with respect to career education in Latvia and to analyze the activities carried out within the National Program Project *Career Education Activity Provision in the System of Education* co-financed by the European Social Fund.

The reconstructed website of Institute of Sustainable Education www.ise-lv.eu is available now for a further acquaintance with *Journal of Teacher Education for*

Sustainability (see section PUBLICATIONS) and, as usual, it will keep informing you about the annual JTEFS conferences “Sustainable Development. Culture. Education”. The Institute of Sustainable Education invites you to follow the information about the next Conference in the NEWS section of website and to submit articles for the next volumes of JTEFS. The terms for article submission are December 15 for the spring volume and June 15 for the autumn volume of JTEFS.

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

STUDENT INTERPRETATIONS OF STUDENT ROLES: WHAT ABOUT SUSTAINABILITY?

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Abstract

The goal of this article is to investigate the relationship between the contemporary humanistic ideology and the student roles as perceived by young people themselves. First, the traditional humanist ideas of education as a relational term and its contemporary features are analysed. Theoretically, a good education today offers young persons positive experiences for developing and is dialogical in nature. After this discussion, the interpretations of young people from different school types and age groups on their perceived role at school and their relations attributed to that role are described. These young people see their role in a very traditional way, meaning that the most important goal is to behave in manner that best insures their receiving good grades. This paper shows that there is no congruence between the currently desired image of education and the described role of student.

Key words: *education; socialisation; student roles; teacher roles; school reality; habitus.*

Introduction

“Teacher, be a human being to us”, “and take us as humans too”. These appeals provide an insight as to how students view their school roles as being dehumanizing (Kuurme, 2004). At the same time, however, modern humanist ideas declare that the mission of an education is to respect and make a person more human. Is there an apparent contradiction between humanist teaching principles and perceived student roles?

The student roles are like an unavoidable tunnel that children and teenagers pass through as an obligatory means of socialisation. Roles have been considered by some to be the institutional foundation of society. They are understood as behavioural expectations related to a person’s social position that is based on the values and norms of the institution as well as the society. The student roles have their particular features; they justify institutional education, or, in other words, the intention of these roles is to call forth changes in the personality and to become independent (Antikainen, Rinne & Koski, 2000).

This article treats education from a broader perspective than the conscious intentional activities of adults in guiding children and supporting their developmental processes. Even though the concept of socialisation does not include the rich field of meanings related to human development and individuality, the present-day discourse focuses

much more on socialization instead of education. One of the current paradoxes is that despite many educational problems, contemporary education has largely managed on its own (Siljander, 2000; Vuorikoski, 2003).

The main school roles – teacher and student – presume the existence of a conscious educational intention, since being a student implies personal growth and individualism, not solely socialisation. At the same time, student roles imply a socialization process. The role of an individual is determined by the school. In other words, the teacher, student and observer all perceive classroom interaction differently. Also, the character of student roles is inseparably related to the characteristics of teacher roles.

As follows, we will focus on the humanising function of education, which is also represented by the discourse of sustainable education, and the changes in understanding education in recent decades. How do young people perceive and understand their role at school? How do they relate to this role? These questions are particularly important because of the growing public criticism and dissatisfaction with Estonian educational institutions, which are significantly influenced by school roles. The current article hopes to bring into focus the relationship between the well-intentioned educational conceptions and the reality of student roles in the Estonian educational context.

The double nature of education

The humane dimension of education in the meaning of different educational ideals has existed in the European culture for millennia. The teleological character of education has been received significant Modernist influence. The educational processes were designed to develop so-called mature adults who possessed a particular set of qualities. The individuals embracing these virtues would later take charge of society, meeting its challenges and insuring progress. On the one hand, the educational tasks were based on opening those noble qualities, which the human nature carries in it according to the humanist thought. On the other hand, human nature itself needed to be perfected in order to guide world matters themselves.

Educational thought was accompanied with a faith in human abilities and was expected to guide human potential. Education had to include the main dimensions of being human: senses, will, intellect, sociality, aesthetics, ethics, religiosity, and selfhood (Bruhn, 1968; Fromm, 1984; Hollo, 1927; Puolimatka, 1999; etc.).

One basic educational concept necessary in schools was *experience*. The educative nature of experience does not occur unintentionally, but presumes a certain pedagogical activity. From the anthropological viewpoint, the ability to learn from experiences is a characteristic of adulthood (Dieckmann, 1994). On the other hand, experience binds one with limited horizons and according to Bourdieu (2003) produces certain types of *habitus*, stereotypes of performing and thinking.

How can education free a person from self-imposed limitations? A human being's horizon of experiences becomes enriched through education and through offering new possibilities for experiencing and giving meaning. The idea of critical thinking is important both in pedagogical and educational thinking (Danner, 1981; Puolimatka, 1999; Värri, 2002). The discourse of sustainable education has emphasised the need to consider a more anthropological viewpoint of the educational process (Mandolini, 2007). To accomplish this, adolescents must experience their everyday school life in a way that helps them understand their own transformative power with respect to external world,

to act collaboratively and employ problem solving strategies, to share responsibility and develop critical thinking skills, to be more flexible and actively and creatively participate in daily life (Hopkins & McKeown, 2001; Mandolini, 2007). Mora and Prieto (2007) suggest a new model of educational process, the basis of which is identity and belonging. A student's everyday life should include shared responsibility, active co-operative learning, and diversity of identities. There should be space for the adolescents' need for self-expression, feelings, and sociability.

The individuals' different roles are also based on experiences which give meanings and cause people to ask: What does the role do to me?

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Education does not have an impact through what is talked about it, but rather how it has been *experienced*. A noble promise of a free, self-creating individual diminishes in practice into limitations, responsibilities, obligations, and power intentions. The cultural *habitus* directs the educational process into something stronger than ideals, and instead of being a liberator, education may become the taker of freedom. This unsolvable dilemma has also been called the paradox of education: becoming free elicits limiting freedom (Siljander, 2002). On the other hand there is the socialising task of education, in order to adopt the society's accepted norms. At some point the limit is crossed, from which on taking freedom does not liberate any more, but subjects, humiliates, and harasses. This can also be interpreted as one reason, why e.g. people who have become free from totalitarianism – without becoming free from its educational influences – tend to free themselves from education itself. Realisation of the so-called contra-life experiences (Miller, 2006) has created an anti-pedagogical orientation. Thus it includes also the double nature of a phenomenon called *student*: from one side there is the pressure for socialisation, from the other this phenomenon is inhabited by an individuality, who should actualise itself in its uniqueness, and this presumes education's humane dimension in respect to the person in that role.

There are two primary views of education: one that tries to *do* something with the person, to form him/her, to give him/her a desired shape (Hentig, 1996; Preuss, 1996) and the other is understood as receiving education as help to promote personal growth and development. These two views of education date to Aristotle's *praxis* and *poiesis* which today are talked about in the context of metaphysic and post-metaphysic culture. The metaphysic culture functions on the linear axis of aims and means, and is based on *techne*-thinking (Toiskallio, 1993), which holds a mechanical world-view and instrumental mind. *Techne*-thinking implies a simplified view of the educational processes and emphasises control and measurement. Preuss (1996) finds that this way of thinking originates from the consciousness that dates back to the dawn of humankind, where fear of natural forces made people seek means to govern natural and other forces. The prevalent approaches to education have traditionally viewed the child as an element of nature, as a primordial force that needs taming, of an imperfect nature (*Mangelwesen*) who can be improved through education. In our civilisation, a child learns that his/her needs and feelings are something unwanted that need to be suppressed. An especially cynical way to do this is through "science". Today education is governed by the terror of optimisation, quality, and effectiveness (Hinte & Preuss, 1996; Miller, 2006; Toiskallio, 1993; Uhle, 1993).

The idea of a perfect person in the future *versus* the idea of a favourable educational situation in the present

Paradoxically, the original noble aspiration for the perfect human contributed to diminishing the viewpoint of education serving human development.

The viewpoint that *a priori* presumes an aspiration for human development, and respects individuality, no longer asks what we want from an individual. Instead, it centres on what we *want* from a human being, determining how education should be like. Educational thought in the writings of many theoreticians has significantly changed, especially in the last few decades. According to Värri (2002), education should not be based on the vision of a good future, but of the present moment, since children and young people have the right of living a dignified present, and this should not be sacrificed for a perceived future or societal needs.

Contemporary views of a good education are primarily based on humanist views which maintain that human development is promoted by meaningful and valuable experiences; creativity and independence is vital for growth and meeting challenges and overcoming obstacles contribute to positive self image. Furthermore, a learning environment should provide indoctrination-free discovery, content should be directed by a child's holistic life and child's personality should be respected (Mollenhauer, 1994; Puolimatka, 1995; Värri, 2002).

The existentialist motives in contemporary educational science allow education to be interpreted as an existential encounter. Persons participating in the educational relationship are very tightly bound by their shared situation and it is difficult for them distance themselves from the educational process to objectively view what actually occurs in the educational setting. Although the dialogical relationship is a fundamental principle of education, a different mentality emerges here compared to the common *educator-habitus*: the world in which we live and interact with each other can be neither subjected nor avoided (Buber, 1983).

According to Buber, a new educational attitude that is open and respects the individual can emerge only by consciously evaluating and correcting one's mentality. Contemporary teacher should be a learning partner for the student, a guide to assist learning, a creator and an interpreter of experiences. Contemporary schools are in a constant dialogue inviting persons to live life; a place where a common base for values is created and everyday activities are designed (Tilus, 2004). Adolescents, in particular, should become co-authors of their learning processes, possess feelings of belongingness; integrate freedom and responsibility in creating school as a community. Socialisation in democratic principles combined with a learning process that enriches an individual's horizon presupposes public responsibility (Carleheden, 2006; Whitehead & Clough, 2004). Students would be natural partners in such an educational relationship. Thus, conventional school roles need to be evaluated within this conceptualization and the primary question is: What is the reality concerning student roles in the current educational paradigm?

Boundaries that influence student roles

What function do traditional student roles serve and for what reality does it socialise him/her? What is the educational intention hidden in the role?

The particular nature of student roles in educational thought suggests that the growing out of these roles implies becoming independent. Unfortunately, sociological analyses of what actually occurs in school indicate a different trend. Student roles form part of the rigid and conscientious societal power structure transferred to the school environment. This power structure reproduces societal hierarchies and reinforces already established structures. Many studies have described how schools function according to Modernist principles that actually openly contradict their written goals (Miettinen, 1990; Roggendorf, 2003). Schools are unable to function differently because they are prisoners of economics and politics (Rinne & Salmi, 1998).

The roles of teachers and students are traditionally considered to be asymmetric (Loser & Terhart, 1999). Classroom situations are governed by teacher and the student task is to produce so-called learning results, which correspond to teacher expectations (Sahlberg, 1998). The role of a silent listener and recorder forms the basis of obligatory education, while the role of creator and inventor is rarely seen (Ruus, 2000).

When describing student roles, the words *passiveness* and *consumerism* come to mind as students are seen as material given to teachers to shape according to institutional goals (Laine, 2000). Student roles are very traditional in that the transference of knowledge and societal norms, with a respect for power mechanisms, is the actual educational outcome.

The best-known unconventional ideas about school reality come from Foucault and his followers. Foucault sees the Modernist society as a society based on discipline and the modernist human as a product of control and shaping. Schools, instead of promoting freedom, equality and rationality, are characterised by assigning student roles that stress obedience and submission, while being productive to society. To become productive, individuals are measured, compared and subject to selection (Foucault, 1994).

Basil Bernstein (1975), though, sees important changes taking place regarding rigid school roles. The roles of teacher and student have become more flexible, less hierarchic. Apparently, children have more freedom and can create their own rules governing relations. Societal norms, however, control interpersonal communication and are based on unpronounced rules of the game. A big challenge is to make the rules visible. Ordinary shadow-education is changing into a self-directed shadow-education. Here one can find wider societal links with the so-called *quality tribunal* as described by Masschelein. The regime, which praises quality and makes one to aspire to meet its criteria, makes us govern ourselves as we submit to its criteria. We are called to observe ourselves and give evaluations in a certain prescribed way, to be obliged to account for ourselves (Masschelein, 2007). According to Roggendorf, manipulation can be considered to be the king of school subjects – a soft and friendly way of influencing, where the wish to experiment one's will and decisions becomes minimal, and where freedom to decide is taken away in an unnoticeable way (Roggendorf, 2003).

Bourdieu's concept of *habitus* (Bourdieu, 2003) expresses the long-term impact of being in the student's role concerning his/her individuality. Growing and living under the influence of certain social conditions creates certain attitudes through which unavoidable environmental changes can have an impact. Thus, a complex of attitudes, habits, and mentalities develops that suit the institution. In fact, one real result of education is to mould attitudes, intentions and personality traits in function of different student roles. Not being aware of the *habitus* experienced as a student might lead to

obedience to teacher authority and reinforce the traditional teacher role and behaviours without any questioning. In sum, traditional teacher and student roles may surpass sustainability and prevail over any humanistic aspirations.

The *habitus* of the student roles in education should receive more attention in different local contexts. It should be made more visible for teachers, so that they can think about incorporating humanist ideals in the classroom. We assume that the change of teacher internal attitudes towards a dialogic approach, in opening up to the Other, may better help him/her understand and overcome the habitual limits of the teacher's own role. The following is one attempt to make the student's voice heard.

Student roles as perceived by students themselves

Methodology

Experience expresses a relationship between a person and his/her situation, which in the present case are student roles at school. In the present case, the studied situation was limited according to the classification by Perttula's *reality of the form of living*, which is expressed in interpersonal rules, principles, ways and practices, on which societal life stands (as cited by Metsämuuronen, 2006). The aim was to describe the collective experiences of young people from different schools about student roles.

A semi-structured written interview was conducted with 185 students from five Estonian schools, including both 8th and 11th grade students. Since the aim was to compare the perception of student roles in different types of schools, the following schools were chosen: School A (a regular small town school with 38 eighth grade students and 23 eleventh grade students, respectively), School B (a well-known elite school with strict entrance exams to the language-biased class – 33 and 15 students, respectively), school C (an innovative private school for the wealthy – 27 and 12 students, respectively), school D (Waldorf School – 10 and 13 students, respectively), school E (a private school based on the Danish free school model – 14 eighth graders). The three last schools mentioned, work according to their own pedagogical concepts. The responses to the following three questions were analysed:

- *What kind of students does the school value?*
- *How do you rate yourself, compared to that student?*
- *What kind of an individual would you like to be at school?*

Student responses were categorised into units of meaning. The meanings were “translated” into the researcher's language, interpreted, and generalised. The differences between basic school (n=122) and secondary school students (n=63) and different types of schools were also considered.

Vision about the school's preferred good student

The short descriptions about how respondents perceive good student included many of the same answers: a good student has certain characteristics, studies in a certain way, behaves in a certain way and has a certain relationship with school and teachers. Categories were formed according to these four areas.

Personality characteristics. The following sub-categories were differentiated when describing personality characteristics: intellect, subjectivity, characteristics related to sociability, activeness, and traditional school related characteristics. The latter expresses those characteristics related to student roles, which are determined by societal consciousness.

Traditional characteristics of student were named most often (62 times): a good student is *diligent, hard working, studious, correct, conscientious, excellent, quiet, alert, obedient, punctual, persistent*. Conscientiousness, diligence, quietness and correctness were mentioned the most. These characteristics were mentioned significantly more by students from the language-biased state elite schools (11 out of 15 students).

Almost similarly (61) often mentioned characteristics related to sociability: *communication skills, sociability, friendliness, kindness, politeness, helpfulness, counting on others, respecting others. Cooperation with other students, a good sense of the collective, and selflessness* were mentioned only once.

Several intellect-related characteristics were mentioned less (43 times): *cleverness, wide knowledge, wisdom, natural intelligence, smartness, giftedness, logical thinking, open mindedness, openness, talent, good memory*.

Characteristics related to activity (32) were mentioned even less: *active, enterprising, vigorous, strong-minded, participates in everything, wilful, capable of making an effort, finds time for hobbies, is active in many areas*. These characteristics were tied to the image of a good student significantly more often by young people from School B.

Student's individuality and subjectivity appeared only a few times (17 times): *responsible for one's actions, persistent, manages things on one's own, knows one's aims, expresses one's opinion*. Waldorf-school youth found that *one has to have a sure opinion and courage to say it out loud and courage to ask and interfere in the course of the lesson from time to time*.

The students from Waldorf secondary school described students in terms of personal characteristics most of all. Seven boys out of 23 mentioned it, whereas they did not mention behaviour and study characteristics at all.

Eight grade student descriptions about their school's preferred student are even less connected to subjectivity-related characteristics, but they are mentioned somewhat more *activity*. In terms of other descriptors, they do not differ from their older colleagues. The students used more expressions displaying protest and irony. *Wisdom* was especially important for the language-biased elite school 8th grade students.

Studying. Here the field of meanings was narrow and limited to things being done in a prescribed manner and time frame. Studying to achieve good grades was most mentioned (96 times) by terms and phrases including: *best grades, good results, learns everything that the school has prescribed, keeps studying neat, studies for fours-fives*. Eight grade students stressed studying well and receiving good grades more often.

Furthermore, doing homework every time and doing lessons were also mentioned in phrases like: *sometimes he/she is able to learn a lot of things by heart, studies all the time every day*.

Behaviour. Here too the spectrum of meanings was narrow, but significant differences appeared between 11th and 8th grade students, as well as between free and state school students. Secondary school students wrote little about behaviour, only 20 students mentioned it. Also following school order, being present and absent, listening in

the lesson and working together and being quiet were named. Among eighth graders, 78 mentioned behaviour. Demands for correct behaviour were the same everywhere:

Does not defy teacher authority, attends school regularly, is excellent, is not absent without a reason, is not late, does not violate school order, does not disturb the class, does not chat during lessons, does not swear, does not smoke or drink alcohol, takes study materials along, does not create trouble, does not deal with secondary things, follows school regulations.

School Relations. This field of meanings came up only in the texts of 27 respondents and was stated in terms congruent with school preferences: *takes part in school events and goes to competitions to represent school, organises events him/herself and brings honour to the school.* Moreover, especially the responses of big state schools included: *follows school regulations, attends school regularly and does not do things that could ruin the reputation of school* (8 respondents).

Relationship with the teacher. This was a significant theme in the writings of 15 students who primarily come from two big state schools. Their responses detail the undisputable relationship of submission: *follows teacher's orders, obeys the teacher, does not argue with the teacher, and does not defy authority.* Four students mentioned *knows how to sneak.*

Four students of School B mentioned self-respect in their relationship with the teachers: *one does not adulate teachers, respects teachers and fellow students, does not argue with teachers, but also does not let them to use him/her.*

Summary. Students who responded along school preferences represented a rather narrow spectrum of characteristics. This shows a model of socialisation that suits the institution, rather than a model that favours a more humanistic educational process. Such results can be explained by how young people understand learning. The absolute value compared to other things is given to learning, which is marked by the grade. Learning, for Estonian students, is a self-limiting and numbing task when observed externally. Few students mentioned a constructive or democratic relationship. Students also report behaviours that better serve the institution. One third of the respondents stress the value getting along well and having a relationship that supports others. Student's *self* has a limited value for the school. Distinguishable here was the Waldorf School, where it was valued more. The concept of *creativity* was not mentioned at all and *thinking* was mentioned only twice.

Vision about the self compared to the student as preferred by school

Student responses allowed us to categorise the self-evaluations into four categories: 1) identification with the student roles preferred by school; 2) lack of identification with the student roles preferred by school; 3) aspiration to student roles preferred by school, 4) opposition to student roles preferred by school.

Identification with the student roles preferred by school. One third of the students completely or partly identified with the student roles preferred by school. In the secondary school, this number was slightly less than a half.

In the case of basic school, so-called traditional characteristics were prevalent: *grades are more or less good, I do not cause disorder in the classroom, I follow the*

school rules, I am diligent, I obey the teacher, I do not argue with the teacher, I generally do my homework, my attitudes about school are good. A few also mentioned social qualities: I am polite and kind, I am active, I am helpful.

Secondary state school students repeat the same list as basic school students. A recognisable difference appeared in the descriptions of the private school and Waldorf School students, where the motives of accomplishing tasks and following school rules are surrendered:

I respect myself. I am open and I dare to ask if I don't understand. I think I am flexible (school C). I have quite wide knowledge. My achievements are my own, not schools business. Inevitably, I remain indifferent about some subjects, insofar as I want to specialise more on those that interest me. I have achieved my teachers' respect and I am especially proud that I go to this school (Waldorf School).

Lack of identification with school's preferred image of a student. Altogether, 81 students fall into this category. Of 122 basic school students, 57, or nearly a half mentioned this, whereas a considerable part (23) from school A. More than a half of secondary school students identified with such an image.

In case of basic school students, the already mentioned traditional features of the student image prevail, where students are the focus of negative self evaluations: *I do not study very well, I sometimes violate order, I am sometimes late, I chat in lessons, I am quite lazy, I do not always do my homework, I am not excellent, I am not very active. Being late, not doing something, and laziness* were also mentioned by secondary school students. The replies of 10 students from different schools refer to certain strategies and ask about the point of things:

I study what I need for exams. I do all essential homework to keep my grades up. I study selectively what is necessary. If the teacher would make lessons more interesting, I would learn more. I live my own life besides school. I do not organise events, since school seems to be rather pointless to me. I do as much as is useful for me. I am not sure about the necessity of some tasks. I go to school because of my friends. It would be boring if no one would be late or make jokes.

Aspiration to be an ideal student. Eight students from both school levels expressed this attitude. They try to *learn better, not to be late, do homework, be more active, etc.* One student expressed the following: *I try to make nobody feel bad at school (Waldorf School); I should improve my grades and be more open-minded (School C).*

Opposition to the school. There were 17 such students: five secondary school and 12 basic school students. Additionally, some of them claimed not to do the familiar things schools expect. Some examples of comments include the following:

Eighth graders: *I do not let anyone walk over me, pressure creates defiance. I would like to have more freedom, I use too much time for school. I have no wishes. I do not want to change in order to please a certain teacher.*

From high schools: *I resist because studying is not the most important thing. I have my own opinions. I would not want to be changed into a student who just keeps school levels high.*

Summary. Students tended to compare themselves to the school's ideal image of a student and school norms. The students, in particular, related how a school's ideal student should function, excluding attitudes and personal characteristics. Thinking about one's being and inner attitudes was found among few youngsters. Student roles remain an external shell for students with the only exception of some students from the two private schools. Opponents to schools perceived expressions of subjectivity, whereas some revealed that they possess their own personal strategies to respond to school demands.

Vision about self as a person and individuality or how one likes to see oneself at school

Analysing the meanings that appeared in texts, the following categories were distinguished: 1) I feel like myself at school; 2) I would like to feel myself...; 3) I do not feel I am an individual at school; 4) I do not relate to school.

Feeling like oneself at school. Altogether, 45 students claimed they felt like themselves at school. Of these students, 27 were from basic school and 18 from high school. Private school students generally felt this way more frequently when compared to their homologues from other schools. This means that these students are satisfied with their present state. Six basic school students mentioned that they wished to be ordinary students, not to be important or first in the class. In general how one feels at school depends on each individual:

I wish to be and actually I am myself. It is possible in our school because everybody is open-minded and caring. I wish to feel happy and it is possible since at the moment I feel so.

Four out of seven Waldorf secondary school students said that it is possible thanks to the school: *Here it is possible. Here they treat you like an individual. I feel relatively good thanks to this school.*

I would like to feel myself... Altogether 107 students wished to feel themselves different or wanted to have a different attitude toward them, of them 73 from basic schools and 34 from high schools. The majority of young people are not satisfied with how they are at school, and it concerns especially basic school students. More than two thirds of the youngsters from big state basic schools felt so. Over a half of all the students from school E and Waldorf School expressed a wish to feel themselves different. Secondary school students from school A (16 out of 23) most often wished to feel themselves differently.

How do students wish to be like? From one side the position among others and from the other side one's inner state, qualities, and being at school, were mentioned.

Position among others. Here two different types of motives were encountered, from one side – and so found a relatively big number of students (33) – one wishes to be respected, noticed, and taken into account by others, on the other hand some youngsters wished to be ordinary, modest, and unnoticeable (10). More than others, language-biased elite school B students (15) wished to be noticed and to dominate, both in basic and secondary schools. They wished to:

Feel important and be taken into account, to be someone who is respected, to have an impact when they say something, to have their wishes considered important, to have their opinions matter, to be well known in the entire school and speak with everyone, to have their proposals listened to and respected, to play a significant role, to be noticed by others, and to be popular.

Students from the same school saw themselves predominantly through the eyes of others, wishing not to be evaluated only with grades, but also to be a friend to others. Nobody from the Waldorf School wished to stick out. From every school, there were students who wished to stay ordinary and unnoticeable:

I am happy with who I am. There is no need to be important. It is not important to me. It is important for people to support me just as I am.

I want to be calm like I am at home and not have to care about my looks or what others think about me. At school I can not be like that.

Waldorf School 8th grade students especially wished to be better students and to be a model for others.

One's inner state. Here the word *freedom* appeared most often. Basic school and big state school students especially wished to feel free, but there were also similar responses from some students from private schools (altogether 16).

I wish to feel unafraid of speaking freely. It is very much possible because the only person who sets my limits is me. I wish to be bold enough to perform without panicking.

Other meanings referred to sociability, activeness, successfulness, being an easy going and happy person, practical, and equal.

It is important to note that only a few students mentioned that it is not possible to be in school as one wishes to be. Those who wanted freedom most often felt external limitations. Thus, they felt external dependence, but also realized that fulfilling their wishes depended mainly on their capacity.

Lack of feeling like an individual at school. Few students could be included in this category, and of a total of 12 students, only two of these students were in secondary school:

I wish I could feel free, so that I did not have to pretend to be someone else. I wish to feel free so that people did not try to control me all the time or tell me what to do. It is possible only outside the school. One can not feel like an individual when there are 36 students in the class; you become merely a name for the teacher.

Lack of relationships with the school. There were altogether only four students who responded as such: *School is not life. You only work at school for the sake of learning. It might happen that after school you are a completely different person.*

Summary. Despite the fact that student roles are narrow, a rather large number of youngsters feel that they can be themselves at school or they wish to change their position among others. Elite school students predominantly wish to be more noticed and respected; thus, to dominate. At the same time, there are students who do not wish to

be seen or prefer being ordinary students. This student role is perceived as their having to receive some harassment and is primarily about wishing to feel more freedom. At the same time, the majority of students find that it is predominantly their responsibility to become the people they want to be.

Discussion

We will try to relate the aspirations valued in the traditional humanist image and the above-mentioned accents of education with how students themselves perceive their role. How to evaluate the educational influence of student roles or, in other words, what school does to a person?

Looking at the role description perceived by students, taking school practice into consideration, the traditional student roles appear to be even more “sustainable” than humanist ideology. The subjectively experienced student roles are narrow, emphasising external behaviour and behaviour to norms. Furthermore, student responses express their vision of what schools expect of them.

School sees learning primarily as a normative ritual for students. What students learn, how they learn, whether they understand or not and whether any personal changes occur as a result of the learning process, does not appear to interest schools. Students speak mainly about grades and dealing with tests. Therefore, adopting and functioning to the system is more important to students. Student roles appear to result in a perception of external pressure, rather on their mobility, constructive use of time and activities that promote inner, personal growth. Importantly, students did not mention morals when describing roles. The character of student roles is determined to a large extent by teacher. Vuorikoski sees the teacher roles changing with the introduction of new liberal ideologies. At the same time, the strong normative aura of the profession remains, although with a stress on the instrumental (Vuorikoski, 2007). This, however, strengthens the traditional understanding about the student as an obedient follower of orders.

Sociability is important for the students. Being part of the collective is important, not teamwork, cooperation, common responsibility, mutual understanding and dialogue. Personal qualities, views, ethics, attitudes, and wants are not stressed in students perceived image of their role. This reflects the perception that schools are not interested in these factors and does not play a significant role in their development. Loser and Terhart found similar tendencies in German students. The requirements of school and private life are held apart (Loser & Terhart, 1999). Thus, there is no reason to speak about experiences that widen developmental possibilities, individual creativeness and independence, stimulation by rich studying environment, or provision of surroundings that enable discovery and individuality. However, there is hope for change as many students hold an opinion that school values also include activeness, openness, initiative, courage and awareness of objectives.

The teacher is an external power, a task master who has to like you and who has to be flattered. Students do not report suffering a lot because of this aspect, but report, in general, that they can feel and exhibit their individuality fairly well. If a person wishes to be different, it is generally allowed at school. Obstacles are generally internal. Students seem to accept this part of their role and consider it something inevitable; a rule of nature. There is no reason to argue about this point since most students adapt to this aspect in a more or less satisfactory manner. Role related demands are allowed into

one's personal worlds in a discrete way – or not at all. No energy is invested in contradicting the role. One just states calmly: I am somewhat different from what they want me to be.

The main concern in relation to student roles is how they grow out of them to become a responsible adult and a life-long learner, especially valued in postmodernism. This research reports a shocking truth; there are few attitudinal differences between eighth and eleventh grade students enrolled in public schools. The only students who reported different attitudes were students enrolled in the Waldorf, where eleventh grade students viewed their role as thoroughly positive, presuming better personality characteristics, and a personal, grounded relationship with studying. The ordinary student roles thus rather create premises for remaining a student – someone who obeys and passively receives knowledge. The nature of the role did not merit further critics by most students – since the role has become something mechanical. Many young people have accepted responsibility for their roles as students. They consider it to be their own fault if they do not manage to the person or individual at school they wish to be. This may reduce the will to change one's being from within in an effort to be as the school wants them to be. A relationship to studying and the possibly developed student-*habitus* refers to the amazing sustainability of old role and life models, which might not, however, develop into sustainability of cultures and societies. Yet, there was a distinguishable group of students who had a creative and critical approach to their roles and who related to them according to their own objectives.

When thinking about the hope for a full and holistic human life, which is expressed in the multilevel interpretations of the concept of education (e.g., Mandolini, 2007), one should ask, what will not be studied due to traditional student roles; what will not be experienced, done, or realised. Mandolini makes the statement: "Education is responsible for the creation of the life of the world" (p.9). Traditional student roles do not promote a new world-creating force. At the same time, there is hope because students appear to accept their roles in rather superficial terms. The roles do not harass students excessively. The predominant feeling is being true to oneself, which leads one to believe that responsible dialogue is possible with students.

Fulfilling humanist ideals at school and real sustainability implies changing teacher roles. Finnish researcher Lauriala argues that the teaching profession has acted significantly to professionalize teaching. This means teacher has greater autonomy and freedom than just a generation ago. The increased autonomy of the teacher, however, implies greater responsibility. A good teacher is empathic and sensitive to children's subjectivity, interpretative spirit, and need for understanding. The most important question for teachers is how to act in a way that is pedagogically right (Lauriala, 2002). Nevertheless, such autonomy cannot simply be provided by state directives – it must emerge from the teacher's own consciousness. Thus, student reflections regarding their roles provide insight for teachers about their roles and ultimate influence.

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**EDUCATION POLICIES AND TEACHER EDUCATION
PROGRAMS: MEETING THE MILLENNIUM
DEVELOPMENT GOALS**

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Abstract

This paper explores the present situation regarding the education policies and teacher education programs in Nigeria in light of the Millennium Development Goals (MDGs) cited in the 2000 United Nations Millennium Declaration. The MDGs declaration helped awaken nations to the need for structural features that empower education policy makers and planners in creating effective educational systems. A survey was used to gather data from teachers and school administrators in Nigeria. The data suggested that both teachers and school administrators are discontented with the lethargic policies and implementation of programs in meeting global standards. In particular, the empiric data could be useful for education policymakers, planners, administrators, and researchers who need information that might help them to improve their activities and deal with the controversial issues.

Key words: *education policies; teacher education programs; sustainable development; MDGs; Nigeria.*

Introduction

The eight Millennium Development Goals (MDGs), which range from halving extreme poverty, halting the spread of HIV/AIDS to providing universal primary education and eliminating gender disparity in primary and secondary education, preferably by 2005, and at all levels by 2015, form a blueprint which has been agreed by 189 countries. They include the world's leading development institutions. These goals galvanized unprecedented efforts to meet the needs of the world's poorest. A monitor was developed (The MDG Monitor) as a one-stop-shop for information on progress towards the MDGs, globally and at the country level. It is intended as a tool for policy makers, development

practitioners, journalists, students and others interested in learning about the Goals and in tracking progress toward them (United Nations, 2007a).

Education and training are prerequisites for moving society toward sustainability. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (ESD ToolKit, n.d). Sustainable development strategies and experiences provide for implementation of the MDGs. In today's world, the vital role of education has become even more significant since the galvanization of the MDGs. Education has an immense impact on human society in reducing the mortality rate among children under five by two thirds and the maternal mortality ratio by three quarters. It is an absolute necessity for the economic and social development of any nation.

Given the diversity in the tiers of government, conflict of interests among them is inevitable. So it is hard to identify policy choices that could serve best the whole country. The way forward typically will involve tradeoffs among competing ends. Managing these tradeoffs effectively is therefore a key mission for decision-makers in the education sector (Mingat, Tan & Sosale, 2003).

However, a newly published brief notes that to achieve these tradeoffs at the mid-way point between the adoption of the MDGs in 2000 and the 2015 target date in Sub-Saharan Africa is not a realistic option. Although there have been major gains in several areas and the Goals remain achievable in most African nations, even the best governed countries on the continent have not been able to make sufficient progress in reducing extreme poverty in its many forms (United Nations, 2007b).

The main focus of this study is to discuss the policy aspects of the education sector and the role of teacher education and its impact on the arrangements for effective education service delivery. It looks at teachers' and school administrators' perceptions of education policies and teacher education programs. The objective is to show how effectively policy issues in education are managed. This quantitative study can make a significant contribution to the discussion amongst policy and decision makers, planners, teachers and administrators in education. In the education sector, developing a shared understanding of the problems and a strategy to address them is critical for achieving results, because such consensus encourages cooperative and synergistic action by the stakeholders who typically play a part in implementing policies in education (Mingat, Tan & Sosale, 2003).

Review of literature

Nigeria's national policy on education

After independence from Britain in 1960, Nigeria's federal government had little influence on education matters at the primary and secondary school levels because that was the constitutional responsibility of the states. This resulted in a multiplicity of educational policies and practices and varying standards of education. Prior to the coming of the British, various Nigerian people had their own education system, as is the case in other countries of the world. According to Fafunwa (1974, 1991), the young were taught how to conform to the social customs and traditions of the community and trained for a trade or vocation to make them good citizens. Such education was aimed

at maintaining continuity in various vocations (especially in medicine, arts, and crafts) and culture by transmitting to successive generations not only accumulated knowledge but standards of beliefs, norms, and values.

However, the turning point in the Nigerian education system was the contribution of the United Nation General Assembly in 1979. Since then, the Nigerian government has pursued education policies aimed at shaping the individual into a sound, useful, and patriotic citizen of the country. The UN General Assembly proclaimed 1979 as the International Year of the Child, which among other things called for free and compulsory primary education, secondary education accessible to all, and the accessibility of higher education. This declaration considerably supported and encouraged the less developed countries of the world to embark on educational development in their countries through diverse educational programs and policies (Ololube, 2006b).

Consequently, a national policy on education was fashioned. The National Policy on Education (NPE) is as much a policy statement as it is a curriculum document. It sets out the goals and aims of Nigerian society, from which are derived the goals of education and subsequently the objective of each level of schooling (Akpe, 1991). The policy document addresses the issues of imbalance in the provision of education in different parts of the country with regard to access, quality of resources, and girls' education. The NPE, popularly known as the 6-3-3-4 System, was introduced in 1977 and revised in 1981 and 1989 respectively (Federal Republic of Nigeria, 1981, 1989). It marked a radical departure from the British system of education that Nigeria inherited at independence in 1960. Nigeria adopted the American system of 6 years of primary education, 3 years of junior secondary school, 3 years of senior secondary school, and 4 years of university education.

The 6-3-3-4 system of education as copied from the United States was adopted in order to achieve or at least further the following national goals:

- The inculcation of national consciousness and unity;
- The inculcation of the right type of values and attitude for the survival of the individual and Nigerian society;
- The training of the mind in the understanding of the world around it;
- The acquisition of appropriate skills, ability and competencies, both mental and physical, to equip the individual to live in and contribute to the development of his society (Federal Republic of Nigeria, 1989: 8).

This underlies the phenomenal expansion of education at all levels and the vigorous experimentation in all aspects of education within the last two decades in Nigeria. In support of this, the government provided educational opportunities for all citizens at the primary, secondary, and tertiary levels. The government placed emphasis on the quality of education and established nationally acceptable standards and practices in order to ensure even progress and development throughout the country (Federal Ministry of Education, 1995). For example, new policies contained in the NPE (2004) proposed a system of education that would be cost-effective while simultaneously making students more marketable by equipping them with ICT skills for a wide range of employment opportunities (Ololube, 2007; Oduolowu, 2007). The implementation of these objectives became problematic due to the need to achieve uniformity throughout the country, lack of capacity for planning and management, and lack of the necessary resources. The system in general faced a teacher shortage problem, particularly with regard to teachers who possessed the appropriate qualifications, expertise and experi-

ence to teach effectively. These difficulties have been most pronounced at the foundation levels of education. Both the primary and secondary school levels have been negatively affected. The basic infrastructure in schools, such as classrooms, laboratories, workshops, sporting facilities, equipment, libraries, were in a state of total decay. Thus the physical condition of most schools is reported to be pathetic (Moja, 2000; Ololube, 2005a; Yusuf, 2002).

Teacher education and training

The need for an effective education policy is not new, but the demand for it has been growing in recent years. Attending to outcomes is consistent with everyone's concern about the ultimate objective of investing in education and teacher education to produce literate citizens and skilled labor adequate to match demand in the labor market (Mingat, Tan & Sosale, 2003). More importantly, an effective teacher education policy and teachers' roles in the educative process are central to basic education. The teaching force is the foundation of quality and relevance of education at all levels (Oduolowu, 2007). The best way to enhance instruction in order to meet the MDGs target of 2015 is through effective teacher education programs, which are key to understanding both teaching and learning. Such programs are meant to help individual teachers grow and develop as teachers, provide them with the skills and professional abilities to motivate children to learn, and to assist them in acquiring the right understanding of the concepts, values, and attitudes needed, not only to manage classroom instruction but also to contribute to the society in which they are born, grow, and live. Thus, teacher education is designed to produce a highly motivated, sensitive, conscientious, and successful classroom teacher who will handle students effectively and professionally for better educational achievement.

In Nigeria, reasonable preparations have been made to improve teachers' professional development through the establishment of colleges of education, both at the federal and state levels. Institutes of education and faculties of education in various universities have also been established to provide effective and professional teacher education programs. In such institutions, students receive training that will help them become teachers capable of shouldering responsibilities, showing initiative and being good models for their future pupils (Ololube, 2006b, 2007).

The objective of Nigerian teacher education as contained in the NPE (Federal Republic of Nigeria, 1981) which was revised in 1989 is as follows:

- To provide highly motivated, conscientious and efficient classroom teachers for all levels of our educational system;
- To encourage further the spirit of inquiry and creativity in teachers;
- To help teachers to fit into the social life of the community and society at large and enhance their commitment to the national objective;
- To provide teachers with adequate intellectual and professional background for their assignments and to changing situations, not only in the life of the country but also in the wider perspective;
- To enhance teachers' commitment to the teaching profession (Federal Republic of Nigeria, 1989: 38).

It is interesting to note that the aforementioned aims and objectives of teacher education in Nigeria are meant for all levels of education and sound very promising in moving the country forward.

The NPE (Federal Republic of Nigeria, 2004) Section 9, sub-section 65 states that at the Nigeria Certificate in Education (NCE) and degree levels, teacher education programs will be expanded to cater for the requirements of vocational, technical, and commercial education. The sub-section also recognizes the problems with Nigeria's education system and the federal government's promises to implement the commission's recommendations by providing physical facilities and qualified staffs in schools. Sub-section 67 acknowledges the federal government's willingness to direct the universities to work out a program to make it possible for suitable qualified holders of the NCE to complete a degree in education at the university in two years instead of the present three years. Sub-section 73 states that teacher education will continue to recognize changes in methodology and curriculum and promises that teachers will be regularly exposed to innovations in their profession; in-service training will be developed as an integral part of continuing teacher education. The NPE further argues in sub-section 74 that

Regardless of efficiency of the pre-service teacher training, there will necessarily be areas of inadequacies. In-service education for teachers will continue to fill these gaps. For instance, library service education, evaluation techniques, guidance and counseling, etc. will be systematically planned so that successful attendance of a number of such courses will attract incremental credit and/or count towards future advancement (p. 51).

Even with all these statements and programs in place, little has been achieved. However, the goal for which these moderate preparations were intended has had no meaning because we have always expected that the products of teacher education institutions will be employed to handle the instructional processes in the Nigerian schools for which they have been trained. Yet, incompetent teachers are still employed to carry out teaching. Educators in Nigeria (e.g., Adigwe, 1991; Ololube, 2005b) have argued that the falling educational standards can be attributed to the use of teachers who are unqualified for instructional purposes, which include those with general education (academic) qualifications, such as BSc., BA., MSc., and MA degrees, etc.

Impediments to effective education policy and teacher education programs in Nigeria

There are several barriers to the successful implementation of education policies and teacher education programs in Nigeria. We shall limit ourselves to a few:

Political

Politics cannot be divorced from education, culture, society, religion and economics. Education policies will be difficult to implement without political will and considerations. Over the past decade, Nigeria has been plagued by frequent political unrest. This political instability has had negative effects on the education system. Although education had been in crisis for many years, the situation has recently been made worse by

frequent strikes staged by students, faculty, and teachers (Moja, 2000). For instance, the past civilian president (Chief Olusegun Obasanjo) forced university students to stay at home for one academic session for fear that they might disrupt his third time political agenda.

The majority of education institutions in Nigeria are influenced by the political environment that has created a crisis in the academic community. Appointments of friends and relatives into sensitive positions without due qualifications has adversely affected the educational system. This is made worse during the past two decades, which witnessed a huge turn out of graduates from the education system into the labor market. Dozens of university graduates lined up for a single opening, and many more for less specialized positions. Under such conditions, preferential treatment, ethnic and family favoritism, and bribery flourished in employment decisions. The overwhelming influence of politicians in recommending persons for appointment into faculty positions makes such a situation even more frightening, as merit does not guide staff recruitment and selection.

Obiakor, Maltby, and Ihunnah (1990) outlined some political problems that impede education policies and their implementation in Nigeria. These problems include, but are not limited to the following:

- There is less emphasis on national interest/patriotism;
- Foreign nations set the tone in their development aids and transfer of technology;
- The tribe or religion is given more consideration over political manifestos;
- The frequency of transitional government;
- Political leaders find it difficult to hand over power without causing bloodshed;
- Political accountability of the ruled is not considered;
- There is incessant politicization of educational, cultural, societal, religious and economic matters;
- Political corruption or structural failure;
- Lack of trust for politicians.

Economic

Much of the difficulty faced by education in general and the teacher education sector in particular lies in the weak economic situation of the country. Embezzlement (theft of public resources by public officials), corrupt practices and serious neglect are the order of the day in the economy including the education sector. Thus, academic standards have fallen tremendously over the years. Educational achievements amongst students are purely self-development with a little assistance from some sincere teachers. Presently, almost all the instructional materials that aid teaching and learning, i.e. textbooks, classrooms, laboratory equipment, access to the Internet (computers) and other ICT equipment, etc. are in short supply. To make matters worse, inconsistency in economic policies and the provision of electricity have hampered the growth of education in Nigeria (Ololube, 2006b).

Another formidable obstacle to the use of information and communication technology is infrastructure deficiencies. Electrically powered equipment and instructional materials are made to function with other infrastructure such as generators under “controlled conditions”. For the past fifteen years Nigeria has experienced difficulty provid-

ing a stable and reliable supply of electricity country-wide. When electrical supply is not stable and constant, it is difficult to keep high-tech equipment such as computers functioning, especially under the extreme weather conditions found in Nigeria. The high levels of dust during the dry season also shorten the life spans of electronic equipment (Aduwa-Ogiegbaen & Iyamu, 2005).

A good number of teachers/lecturers are now either contractors supplying goods and services to schools or engaging in commercial business within and outside the school to the detriment of their academic calling and purpose. For example, some of them have turned their offices into commercial centers either offering typesetting services or engaging in buying and selling petty goods. Some of them argue that they have had to resort to this “moonlighting” to augment their salaries, which are meager and irregular. The education institutions that are established to promote intellectual excellence, good virtues, etc. have deviated from their traditional obligations of teaching, research, and development of manpower. We are faced daily with reports of students caught in armed robbery, rape, assassination, etc. A majority of these institutions have seemingly forgotten their goals and have instead allowed social and political factors to create crises in their academic communities. It is a known fact that no segment of the education system gets its entire approved annual budget (Olujuwon, 2003). Thus, researchers and commentators (Ololube, 2006a,b; Ololube, 2007; Lawal, 2003) persistently argue that Nigerian public schools at all tiers are experiencing dwindling standards in the quality of education as a result of poor quality education policies and programs, and the graduates of these institutions are unemployable and are treated as such both internally and globally.

Financial

Education funds refer to budgetary allocations that are readily available or that are going to be made available at a stated time by governments or institutions for the purpose of paying salaries, allowances and benefits, and the building and provision of educational infrastructures to aid teaching and learning. Education funding in Nigeria has gradually been on the rise culminating at an increased allocation of 11% (N166bn) in 2006. The total allocation for 2007 was (N186bn) up from N166bn in 2006. This represents a growth of 12%. The bulk is targeted at human resource capacity building, the upgrading of facilities in educational institutions and bold new reforms to improve the quality of and access to education. This figure excludes intervention through the Universal Basic Education Commission, which provides additional resources of N35bn to state and local governments to support basic education. These additional resources are to be used to upgrade infrastructure and teaching facilities in primary schools across the nation and to fund other initiatives (Africa Research Bulletin, 2006). Thus Nigeria is struggling to meet the 26% allocation recommended by UNESCO as a means of attaining quality education and education for sustainable development from 2005 to 2014. Despite improved budgetary allocation to the education sector in Nigeria, the condition of education remains worrisome. Conditions of facilities are still a far cry from acceptable basically due to past under-funding and systemic corruption (Ololube, 2007; Ololube, 2006c; Samuel, 2006).

In spite of the federal government’s specification in the National Policy on education that “teacher education will continue to be given a major emphasis in all our

education planning because no education system can rise above the quality of its teachers” (Federal Republic of Nigeria, 1989), education has continued to be grossly under funded. Inadequate financing from both federal and state governments militates against the progress of the colleges of education and teacher education generally, and this indicates that professionalism is a very remote possibility (Lawal, 2003). Equally, according to Odenigbo (n.d), financing educational ventures in Nigeria, especially since the newly created states, has been very poor, to say nothing of training the teachers/tutors at all levels of education.

Overall, government funding of education has been inadequate. The funding of education is shared among different levels of government and supplemented by funds from other sources such as business, community organizations, and levies charged to parents. The revenue collected through fees constitutes an insignificant proportion of the revenue of the institutions. Inadequate funding of education has been one of the most significant causes of the low quality of much of the education offered at all levels. Funding allocations have been in flux during the last two to three decades. On the whole, there has been a drop in the funding level of education.

Methodology

Research hypotheses

The aim of this research is to identify the Nigerian teachers’ and school administrators’ perception of the education policies and teacher education programs for effective education service delivery towards meeting the MDGs. Specifically, the study addressed three null hypotheses:

- H_1 . There are no statistically significant differences between the perceived impact of education policies realized in Nigeria and the MDGs;
- H_2 . There are no statistically significant differences between the perceived impact of teacher education programs implemented in Nigeria and the MDGs;
- H_3 . There are no statistically significant differences in the opinions of research participants based on their background information (gender, age, specialization, status).

Participants

The research sample for this study consisted of teachers and school administrators (principals) drawn from 20 secondary public schools out of the 146 in Rivers State of Nigeria. A total number of 205 respondents, which were randomly selected, were engaged in the research. The majority of respondents (68.3%) were male, while 65 (31.7%) were female. Regarding the age, 47 (22.9%) of the respondents were 25-30 years old, 84 (41.0%) were 31-40 years old and 74 (36.1%) participants were 41 years old and older. Considering the specialization of respondents, 159 (77.6%) of them had specialization in the science and social sciences, while specialty of 46 (22.4%) respondents was the humanities. At the same time, 170 (82.9%) of them were teachers, while 35 (17.1%) were school administrators (principals).

Research instrument

This study employed a survey research design. The survey was designed following the characteristics of a good questionnaire: relevance, consistency, usability, clarity, quantifiability, and legibility (Nwagwu, 1997: 93-94). The contents of survey were validated by colleagues experienced in designing research surveys. The respondents were asked to determine the impact of the different factors on education policies and teacher education programs in Nigeria using a four-point Likert-type scale. The scale anchors were 1 = strongly disagree to 4 = strongly agree. The survey consisted of a set of items, all of which were considered as having approximately equal "attitude value" and to which subjects responded with a degree of agreement or disagreement. The survey included three major sections: (a) the respondents' background information, (b) respondents' perception of education policies and the factors inhibiting the movement toward MDGs, and (c) respondents' perception of teacher education programs and the factors inhibiting the movement toward MDGs. The data were gathered on two occasions between February-March and September-November 2006 through direct contact with the respondents to explain the aim and objectives of the research. The coherence and reliability of items in each section was examined by Cronbach's alpha: background information (9 items) $\alpha=.85$, education policies factors (7 items) $\alpha=.92$ and teacher education programs factors (8 items) $\alpha=.88$. Statistic analysis (mean, standard deviation, ANOVA) was conducted using the Statistical Package of the Social Sciences (SPSS) version 15.0 software program (N-205) (Bryman & Cramer, 2001; Saunders, Lewis & Thornhill, 2000; Okeke & Kpolovie, 2006).

Results

Perception of education policies and teacher education programs

Statistical analysis for this study began with an analysis of mean and standard deviation for the respondents' answers. Table 1 shows the mean value and standard deviation for variables of education policies and teacher education programs. The respondents' answers showed that the education policies and teacher education programs of Nigeria are not making any impact towards meeting the MDGs. One sample t-test was used to test hypotheses 1 and 2. The analysis led toward the rejection of hypotheses 1 and 2.

Table 1. Mean, standard deviation and one sample t-test analysis of variables

Variables	Mean	Std. D.	t	df	Sig. (2-tailed)
Education Policies Factors	3.09	.58	62.9	204	.000***
Teacher Education Programs Factors	3.15	.46	69.7	204	.000***

*Df= N-1, *** $p < 0.001$*

Opinions of participants determined by their background

To test to what degree differences exist between the respondents coming from different backgrounds a one-way-analysis of variance (ANOVA) was set at $p < .05$. There were no statistically significant differences in respondents' opinions based on gender, age, area of specialization, and status. Thus, hypothesis 3 was accepted (see Table 2).

Table 2. Analysis of variance for participants' background information

Participants' background information		n	(%)	Mean	SD	F ratio	Sig.
Gender	Male	140	68.3	3.11	.73	1.68	.196
	Female	65	31.7	2.98	.33		
Age	25-30	47	22.9	3.09	.58	1.30	.274
	31-40	84	41.0	2.99	.77		
	41-above	74	36.1	3.15	.46		
Area of Specialization	Sciences & Social Sciences	159	77.6	3.02	.64	1.45	.262
	Humanities	46	22.4	3.24	.57		
Status	Teachers	170	82.9	3.07	.64	.95	.325
	School administrators	35	17.1	3.09	.61		

Discussion and conclusions

The study discussed the policy aspects of the education sector and the role of education and teacher education and their impact on the arrangements for effective education service delivery. It looked at teachers' and school administrators' perceptions regarding education policies and teacher education programs and the factors that militate against them in meeting the MDGs specifically in Nigeria.

The empirical results point to the fact that the respondents are greatly dissatisfied with the insufficient funding, embezzlement, absence of infrastructure and ICT equipment and the slow pace of the integration of ICT into education and teacher education programs, ineffective administration and planning, politization of policies and programs along with student teacher selection processes, which drastically affects the standard of education and teacher education programs. The outdated curriculum is cause for concern. Likewise the respondents are dissatisfied with the recruitment and selection processes in general. They are also not pleased especially with the implementation, evaluation, and control stages of policies and programs. The empirical evidence provided shows that the education policies and teacher education programs fell short of meeting internationally accepted standards. No significant differences exist in the respondents' opinion considering their age, gender, specialty, or status. The findings in this article reinforce the previous studies on the standard of education and teacher education in Nigeria (e.g., Obiakor, Maly & Ihunnah, 1990; Lawal, 2003; Ololube, 2006b, 2007; Oduoluwu, 2007).

The NPE of Nigeria could be strengthened with quality regulatory roles, increased enrolment into the education and teacher education programs with quality training, improved funding, reviewed curriculum contents to include new ones in line with glo-

bal demands, effective education administration and planning, continuous evaluation of policies and programs, innovative approaches of teaching and proper adherence to policies and programs implementation. With this in place, the entire education system would benefit from coherent national policy development rather than piecemeal reforms. The revision of education policies is being considered as a long-term goal, due to other pressing needs. Successful implementation will depend on the availability of adequate resources and the sharing of responsibility amongst different levels of government (Moja, 2000).

Developing countries spend much of their time debating on causes of their perennial socio-economic and political setbacks. It is unfortunate that leaders dissociate the fate of democracy from the quality of intellectual leadership by pigeonholing talented specialists, blaming colonial dominance and world powers for endemic socio-economic problems and acting as tribal/regional leaders rather than national leaders. In Nigeria, policy establishment negatively correlates with policy and program implementation. Education and teacher education policies intended for national development are not well implemented. Therefore, Nigeria and many developing countries need to continuously evaluate their education policies and teacher education programs. According to Obiakor, Maltby, and Ihunnah (1990), continuous evaluation of education policies and teacher education programs will enable policy and program planners and evaluators to:

- Detect how well the policy has helped in restructuring and formulating a new society;
- Discover how well the policy affects the culture, society, economy and politics of the people;
- Detect if the policy promotes democratic ideas which emphasize (a) the importance of the individual, (b) social responsibility, and (c) freedom and liberty;
- Find out how the policy reflects the education, training and complex organization required by modern technology;
- Put the blame where it belongs, i.e, in the hands of policy/program administrators;
- Influence curriculum change and planning to highlight (a) objectives, (b) subject matter, (c) methods and organization, and (d) evaluation (p. 13).

Moreover, since Nigeria is in dire need of development, Nigerian education and teacher education programs are so important that all avenues should be explored in order to increase the soundness of the nation's education system at all levels. In order for a nation to develop, its education must be based on a solid foundation and all facilities needed for enhancing any educational program must be provided. These include the recruitment of professional and academically qualified teachers who are interested in the educational development of the nation. A country can only develop significantly and attain greater heights in the committee of nations through comprehensive education and teacher education programs. The education sector should assume a more active social role in producing research, in debates and in teaching, as this will promote the development and general appreciation of the education system. All teacher education and training must include content that helps teacher trainees to interpret and influence current phenomena in society, economy, culture and working life. Prospective teachers must also gain an awareness of the ethical responsibility intrinsic to the teaching profession not only in theory but also through experience. The models assimilated during education constitute a crucial basis for future work.

According to Yusuf (2002), the main objectives of education are to develop awareness, knowledge, attitudes, skills, evaluate ability and encourage full participation in national development. Thus, the most effective strategy for making steady and sustainable development toward the MDGs is to serve the goals of education and teacher training in an integrated way. These conditions will create level playing ground thus giving education institutions incentives to adopt new and sustainable technologies that will diversify graduates who have higher-value education. Policy action and increased investment in the critical arenas of sustainable education policies and teacher education programs will be essential for responding effectively and responsibly to reach the MDGs.

Implication for research and practice

This research has both practical and conceptual implications that would facilitate a broad understanding of the issues surrounding education policies and teacher education programs in line with meeting the MDGs. The presented unique study both provides support for researchers and practitioners and adds to the emerging body of knowledge regarding this domain of study. In addition, the findings of the study suggest that studies involving the effectiveness of education policies and teacher education programs in the developing world need not stop at this stage. However, there are limitations to this study as the opinion of 205 respondents out of thousands of teachers and school administrators in Nigeria cannot be considered all-inclusive.

This study also has implications for government, administrators and policy makers as well as instructors and other entities that are involved in effectiveness, quality improvement and development of education in Nigeria in particular and Africa in general. In closing, a successful inclusion of proactive decision and policy implementation of education can make an important contribution to achieving the MDGs, by establishing sustainable positive incentives for educational policy production in developing countries.

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CHARACTERISTICS OF SUSTAINABLE CHANGES FOR SCHOOLS

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Abstract

The article discusses some aspects of the concept of sustainable development and its educational manifestation – education for sustainable development. The concept of education for sustainable development is broadly accepted, but less attention has been paid to the extent to which innovations or changes are sustained over time, what characteristics or factors support their sustainability. The article introduces a model of six characteristics of sustainable changes in schools and changes concerning sustainable development in Estonian schools have been analyzed using qualitative research methods. The model consists of the following characteristics: depth, endurance, justice, diversity, conservation, and capital. According to the model, the positive changes in Estonian schools have been about the national curriculum, internal evaluation system as the basis for autonomy and self-management. The areas requiring greater change are justice or interdependence, diversity – respect for other people and the connections between formal and non-formal education as well as between schools and teacher training institutions.

Key words: education; sustainable development; school; values; teacher training; sustainable changes.

Quality of education in today's world is somewhat superficial. While globally the importance of sustainable education is stressed, locally the main focus is on passing tests, hitting targets and obtaining the knowledge deemed essential in the context of a modern economy. In general, children have not been taught deeper values, partly because there never seems to be time for such things, partly because many educators themselves consider information, skills, and training to be the sole or dominant purpose of formal education (Quince, 2006). Spiritual matters have been left out, as they cannot be factored into the economy. These trends have raised the question of necessity of changing education. But we should not be changing education to fit the modern world, but changing the modern world to reflect the values contained within an enlightened and sustainable education (Quince, 2006). These changes require much wider networks – the sectors of formal, non-formal and informal education working together.

The process of implementing changes in schools is a complex one. On one hand schools are densely populated, actively constructed, finely balanced and continuously changing units. On the other, they are stable, subject to the head's authority and the

influence of a peer groups controlled by faithfulness to shared beliefs and values (Shallcross et al., 2006). Therefore only holistic approaches based on collaborative, active cultures have the potential to overcome these apparent contradictions but this requires the clear concept of continuing development.

The concept of sustainable development

The fundamental concepts which underlie powerful paradigms are usually relatively straightforward and easy to grasp. In the area of social science, ideas which affect millions of people and guide the policies of nations must be accessible to all, not just to a variety of elites (Selby, 2006). The growing awareness of challenges to traditional development thinking has led to the increasingly wide acceptance of a new concept that has also become a new paradigm – sustainable development. It is a development that encourages us to conserve and enhance our resource base, by gradually changing the ways in which we develop and use technologies (McKeown, 2002). The challenge of sustainable development is to put this understanding into practice (Steinemann, 2003), changing our unsustainable ways into more sustainable ones. The social component has been recognized as the essential part of the new paradigm (Selby, 2006).

As sustainable development is a concept that has ethical, moral, and spiritual connotations – it requires attitudinal and behavioral changes. The success of sustainable development will ultimately depend on the decisions individuals and groups make regarding their own behavior and the bottom-line of these decisions is their value system (ARIC, 2000; Mang, 2005). But changing someone's value system is a task that is largely based on education. As discussed above today's education is more knowledge-based than based on spiritual development of children which in turn requires reorienting our education. The first two priorities of educational manifestation of the concept of sustainable development – Education for Sustainable Development (ESD) – are reorienting existing education and improving basic education (McKeown, 2002; Selby, 2006).

Study design and data collection

The research for the current article is based on the second phase of the study carried out in Estonia from 2004-2007* (the results of the first phase of this research have been introduced in many articles, see Lukk, 2005a, 2005b; Lukk et al., 2006; Lukk & Veisson, 2007). The second phase was a qualitative component of the survey – a small-scale follow-up study to the first quantitative phase (self-report questionnaires for all stakeholders: school leaders, teachers, students, and parents) with the focus on more in-depth insights. The sub-sample of the study was composed according to the typology of schools based on the results of the first phase (the cluster analysis was used). The sample of the qualitative part of this research consisted of five schools. Full anonymity was guaranteed for all participants (both individuals and schools in general).

The central point of the second phase was to study the school climate. Qualitative research methods were utilized: interviews (both with teachers and parents), observations (all class sessions of 7th grade students were observed for a week in one school) and document reviews (developmental plan of the school, class registers) were conducted to discover how different aspects of the school climate were related to children's coping. The interviews with teachers embraced different aspects: students' coping, rela-

tionships (both students and teachers level), school management, curriculum, physical environment and educational policy. The main analysis method was content analysis.

The article focuses on changes in Estonian schools, discusses different characteristics regarding sustainable development in schools. Among other questions on educational policy and curriculum changes in school the questions about ESD were discussed in two schools – an urban and a rural school. Teachers expressed their opinions about sustainable development in general and draw some examples of education for sustainable development in their school.

The characteristics of sustainable changes

Despite the growing body of knowledge about reorienting education, implementing changes and special education practices of ESD, less attention has been paid to studies about the extent to which innovations or changes are sustained over time, what characteristics or factors support their sustainability (Sindelar et al., 2006).

Combining the characteristics of lasting changes in education (Scherer, 2006) and the principles of sustainable development (ARIC, 2000; McKeown, 2002; UNESCO Education Sector, 2005) a model of six characteristics can be formed for assessing sustainable development and sustainability of these changes in school:

- Depth: the keyword – *values*;
- Endurance: the keyword – *balance*;
- Justice: the keyword – *interdependence*;
- Diversity: the keyword – *equity*;
- Conservation: the keyword – *intergenerational links*;
- Capital: the keyword – *synergy*.

These six characteristics must be analyzed, examined and discussed, especially their essence in the framework of ESD.

Depth. The depth of teaching process at school involves both the content and the organizational side. Success in ESD will take much longer and be more costly than single-message public-education campaigns. It is not possible to change something in school using just one course or one student-conference. Education for sustainable development cannot be based exclusively on knowledge. It is the matter of everyday values that run through every program (Mang, 2005). To become permanent, changes associated with values to address sustainability must occur throughout the programs, practices, and policies of a school system.

Concerning the structure and place of ESD in the curriculum each country faces a fundamental decision. They must decide on a method of implementation – whether to create another subject, (e.g., Sustainable Development, Environmental Education) or to reorient entire education programs and practices to address sustainable development (McKeown, 2002). It is important to distinguish the concept of teaching *about* sustainable development from teaching *for* sustainable development that means changing the goals and methods of education to achieve sustainable development.

Estonian national curriculum stresses teaching *for* sustainable development but comparing the ideas of the national curriculum with their practical implementation – curricula of schools, it appears that schools are stressing more teaching *about* sustainable development. Most of the schools have included different subjects of sustainable

development rather than reorienting their programs. The teachers express their opinion about ESD:

We have heard a lot about sustainable development. Our school even added three courses teaching sustainable lifestyle – they are separate parts of Chemistry and Geography courses.

Even in schools having environmental studies as one of the main study branches of the school, teachers connected sustainable development only with the students attending those classes:

Sustainable development is valued in our school. The students of environmental classes have many subjects about that topic; they organize camps of sustainable lifestyle, etc.

Planning for change is an essential ingredient of success. Analyzing the developmental plans of schools showed that none of them had the ideas of ESD in their vision or mission for the next three years.

Another important point in assessing the depth of teaching is the group of students the majority of resources is targeted on. Teaching to the test or concentrating primarily on lifting up only those students who are just below the proficiency line are short-term strategies (Scherer, 2006). Instead, schools should concentrate on teaching for understanding and connecting to all students – a strategy that has been a very difficult to implement in schools. Teachers indicate:

Although we have a special system at school to support the children with special needs – it is normally meant only for those whom we cannot keep up with the others. So, all the energy goes to helping them and we really cannot find the time for gifted children – they normally manage themselves and therefore they are not a “problem” for the school.

Schools that undertake reforms slowly and persistently produce longer lasting effects than those trying to get immediate returns (Scherer, 2006). Adding some courses in the curriculum gives quick results by increasing knowledge but achieving the true meaning of sustainable development requires long-term strategies of changing the values.

Endurance. Balance is one of the keywords of sustainable development. A sustainable development is democratized, decentralized, and pluralistic process where creation of resources has to be balanced with their distribution (Selby, 2006). A reasonable balance between the desired goals and the available means and resources must be established to assure the endurance of the process.

The concept of sustainable development involves three aspects: economic, environmental, and social aspect. The aim of sustainable development is to balance economic, environmental, and social needs (Harris, 2000). The goals of these three elements are clearly multidimensional, raising the issue of how to balance objectives and how to judge success or failure. It is instructive to examine the problem from different disciplinary perspectives that draws up the next keyword – participation of all stakeholders in order to balance the different perspectives by exploring their internal logic and understanding them.

Estonian educational system has implemented the idea of internal evaluation process as a basis for development. The internal evaluation of school is the process that has

been introduced in most of the countries in Europe – although in some countries it is only recommended (not mandatory as it is in Estonia since 2007) – for example in Belgium, Ireland, Austria, Great Britain, and Hungary (Õppeasutuse..., 2006). The model used in Estonia is based on European EFQM Excellence Model (Õppeasutuse..., 2006).

The process of internal evaluation includes the requirement of studying the opinion of all stakeholders. That change, which came into force in September 2007, has remarkably increased the partnership with stakeholders in schools. Every school in Estonia has to present their first official internal evaluation reports by 2010. But some positive changes can already be noticed concerning partnership with all stakeholders. Teacher's opinion:

The current year [2007] brought big changes into our school-life. Now we officially have to develop our own self-evaluation system. I...I. The biggest change for me personally is the communication with parents.

When all stakeholders are working together it definitely helps to balance the objectives and increase understanding which in turn supports the endurance of changes (Szilagyi & Szesci, 2005; Smith, 2006). To make change last over time requires that reforms not be linked to one person. To assure the continuity, the leadership must be distributed to many (Wagner et al., 2006).

Justice. Sustainable development recognizes the interdependence of environmental, social, and economic systems and promotes equality and justice through people's empowerment and a sense of global citizenship (Harris, 2000). The same keywords can be expanded to a broader meaning. As part of a system, every school must consider its effects on every other school. An ethic of competition does not improve matters for all. Partnership and collective accountability can drive schools to work together.

Schools are interconnected systems. One school's mission may send it to the top of the charts – but end up crippling a neighbor (Hargreaves & Fink, 2006). The fates of schools are increasingly intertwined. What leaders do in one school necessarily affects the fortunes of students and teachers in other schools around them. As exemplary or high-profile institutions draw the most outstanding teachers and leaders, they drain them away from the rest. The more school systems run on the market principles of competition and choice, the tighter these interconnections become (Hargreaves & Fink, 2006).

Although many discussions about the harmful effect of market principles on school development have been held it is still an inevitable trend among Estonian schools. As long as the only variable for comparing schools are the points of state-exams and some schools are recognized as elite ones getting most of the local resources, it is very hard to implement the principle of interdependence as an important part of sustainable development in Estonia.

Diversity. Recognizing the importance of diversity can help one to focus on humanity's capacity to work together to meet the enormous environmental and social challenges (Hudson, 2005). Unity in diversity – the phrase connected with the ideas of equity and social justice. In the context of sustainability, the term 'equity' has to do with fairness – whether all people have similar rights and opportunities.

Social justice is another realm of study that involves values. Social justice that is considered a central part of ESD in most countries includes meeting basic human needs and concern for the rights, dignity, and welfare of all people. It includes respect for the

traditions and religions of other societies and cultures, and it fosters empathy for the life conditions of other peoples. Ecological sustainability and resource conservation are considered part of social justice (McKeown, 2002).

The research results revealed deep problems of equal rights and dignity and also having respect for other people among Estonian schoolchildren. Harassment is definitely a characteristic that should be discussed. According to the children's answers:

- At least some form of harassment was observed in 43% of schools studied;
- 25% of students had suffered harassment during the last 12 months;
- The most common form of harassment is verbal;
- 89% of pupils admitted they had harassed somebody during the last 12 months (mostly verbally);
- 5% of pupils are constant victims;
- Most of the acts of harassment take place at school (Figure 1).

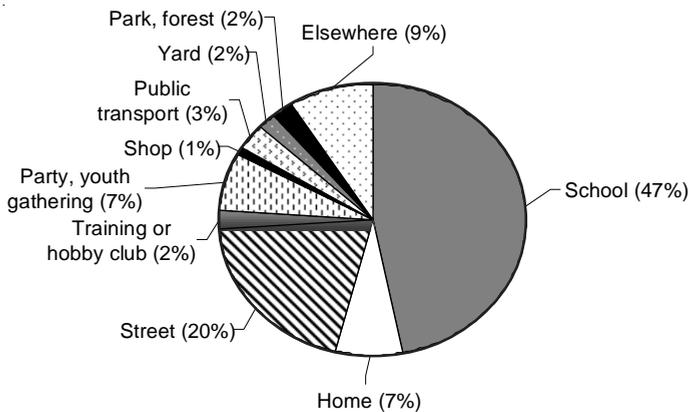


Figure 1. Places where children's harassment occur

These results show the lack of a real understanding of sustainable development in schools and prove that teaching knowledge does not support sustainable changes. Valuing and having a respect for other living creatures, for environment, for everything surrounding us, – this is the core principle of ESD that it is essential to obtain.

Conservation. In 1987 when the World Commission on Environment and Development presented their report, *Our Common Future*, they sought to address the problem of conflicts between environment and development goals by formulating a definition of sustainable development: “Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (Selby, 2006).

The links between generations are necessary to assure the sustainability of changes. These links carry the role of intergenerational mentoring in disseminating messages about sustainable lifestyles (Shallcross et al., 2006). Our actions today are the basis for changes tomorrow. Interdependence that was discussed above as a horizontal characteristic between schools has its vertical dimension as well – it exists across both time as well as space (ARIC, 2000). Past, present, and future are inextricably connected. We are directly linked back in time by the oldest members of the community and forward nearly

a century by those born today. It is important to appreciate that both continuity and change have fundamental influences during the courses of our lives. Understanding the concept of interdependence will assist us in recognizing our responsibilities for the future.

Capital. In the context of sustainability, communities have different types of capital that need to be considered – natural, human, and social capital (Quince, 2006). All of these types of capital are necessary for communities to function and they need to be managed by a community. A community that is living off the interest of its community capital is living within the carrying capacity (ARIC, 2000).

Capital as a characteristic of sustainable development in school involves describing of *synergy* between all stakeholders (Hudson, 2005) – the ideas of democracy, participation, involvement, holistic approach; and broadening the meaning it leads to embracing stakeholders both in formal, non-formal, and informal education.

For a community or a nation, implementing ESD is a huge task. Fortunately, formal education does not carry this educational responsibility alone. The non-formal educational sector (e.g., nature centers, nongovernmental organizations) and the informal educational sector (e.g., local television, newspaper, and radio) of the educational community have to work cooperatively with the formal educational sector for the education of people. The influence of all sectors that are combined in implementing ESD creates a far larger effect that would be the sum of the influences these sectors could have working separately – a phenomenon of *synergy* occurs (Hudson, 2005; Szilagyí & Szesci, 2005).

The synergy-based holistic approach to sustainable development in schools implies that schools practice what they teach (Figure 2) by using the sustainable knowledge and values taught in the formal curriculum also in activities of non-formal curriculum (Juniper & Moore, 2002; Shallcross et al., 2006).

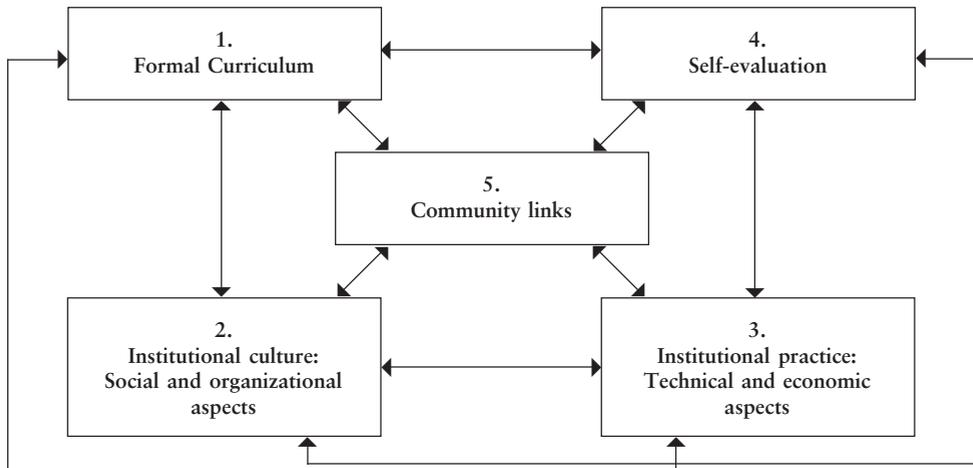


Figure 2. The main strands of a holistic approach of sustainable development in community (adapted from Shallcross et al., 2006)

The synergistic effect of formal and non-formal sectors influences families to promote a sustainable worldview through the actions of their children. Our research examined how children spend their free time and one of the parents described it:

There is an environmental club [a non-profit organization]. My child spends most of his free time there, doing some projects and research; they have camps and excursions. He has been a member of that club for two years now.

Increasing public understanding and awareness is the third priority of ESD (McKeown, 2002) and both formal and informal sectors play an important part in achieving it. The synergy of formal and non-formal education, between cognitive, affective and active, are also relevant in the promotion of sustainable development in universities – in faculties of education where future teachers are being trained (Shallcross et al., 2006). Teachers need to be proficient in interpersonal skills and knowledgeable about group processes such as communication and conflict resolution. This whole school agenda places great responsibility on teachers, and by extension, on teacher education institutions as moral agents (Higgins & Kirk, 2006). Teacher education institutions must strive to be organic learning organizations by practicing collaboration, participation, and adopting democratic leadership styles. Therefore the most important changes must be in teacher education programs that should carry the idea of educating students to become educational agents in the process of influencing transformative social and ecological change.

During the research period, different models of teachers' in-service training appeared as possibly connected with the development of holistic or whole school approaches:

1. Centralized model (the most common): courses delivered by a higher education institution (teacher training college) or government (the courses to introduce the process of internal evaluation in schools).

This kind of approach sees the changes as externally driven and does not equip teachers with the skills to manage change within their own schools. One teacher's report:

I remember attending the course but not exactly what was taught there. Some facts – yes, I do remember, but in general I could not get the whole picture of it. I hope somebody knows better and explains me the things we have to do now [concerning the changes with the new internal evaluation process at school].

2. School-based model: courses delivered by school staff – often untrained and used ready-made external training pack. The people who were chosen to run the course had an attitude of knowing everything instead of guiding the participants onto the right track.

3. School-focused model: special persons are trained to become the “agents” of change to run professional development sessions in their own schools – a training the trainers approach. It requires collaboration with other schools, external advisors, and resource bases. In short, support networks are required that will assist schools in their way through change. If schools are granted greater autonomy, significant reforms can occur within schools, classrooms or communities, rather than being directed from national or district levels (UNESCO, 2005), but schools need the skills and resources to manage this autonomy.

Conclusions

The growing awareness of a new paradigm – sustainable development – has brought many changes in every sector of our society. It is understood as a development that encourages us to conserve and enhance our resource base, maintaining a reasonable balance between the desired goals and the available means – this is the way the endurance of the process can be established.

Education for sustainable development is the educational manifestation of the concept of sustainable development and it faces a difficult task to put the principles of sustainable development into practice.

The concept of education for sustainable development has been broadly accepted by now, but less attention has been paid to the extent to which innovations or changes are sustained over time, what characteristics or factors support their sustainability. A model of six characteristics of sustainable changes in schools is one of the ways to describe sustainable development in schools. These characteristics are: depth, endurance, justice, diversity, conservation, and capital.

According to the model, the positive changes concerning sustainable development in Estonian schools have been the national curriculum supporting the ideas of ESD and also introducing the system of internal evaluation as the basis for autonomy and self-management. The areas requiring deeper changes are justice or interdependence (to diminish the role of market principles in schools), diversity – respect for other people and tighter connections between formal and non-formal education as well as between schools and teacher training institutions.

Transforming the concept of sustainable development into reality is not a short-term process – producing greater lasting effects requires long-term strategies that would support changing the values of the whole community.

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THE DIDACTICAL ASPECTS OF INTEGRATED NATURAL SCIENCE CONTENT MODEL FOR SECONDARY SCHOOL EDUCATION

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Abstract

The main aspects of democratic system of education are a humanistic approach, individualization, and differentiation. Ongoing discussions focus on the best way to teach natural sciences for pupils in humanitarian, social or vocational education programs in the context of sustainable development. For these types of programs, the natural science curriculum should provide all learners with the opportunity to achieve scientific and technological literacy (STL) that is to develop pupils' capacities to function as responsible citizens in the world increasingly affected by science and technologies. This paper highlights specific guidelines for the development of science curricula that are both interdisciplinary and socially relevant. The author emphasizes the context of interaction between human beings, society, and environment. These aspects are introduced in the new school science curriculum of Latvia. The survey of teachers' attitudes towards integrated natural science curriculum and study of pupils' achievements reflects the possibility of promoting scientific literacy of pupils.

Key words: integration; natural science; curriculum; contextual approach.

Science education in the context of sustainability

Social and educational realities of our times have caused many science educators worldwide to rethink science education and to propose a renewed culture for school science. The purpose of science education is not to train a tiny fraction of the population who will become the next generation of scientists. According to Wieman (2007), we need a more scientifically literate populace to address the global changes that humanity faces now and that only science can explain and possibly mitigate global problems, as well as to make wise decisions. Understanding of issues such as global warming, loss of biodiversity, evolution, implications of genetic research, and many other topics is essential, almost a requisite, for personal involvement in the context of sustainable development. Moreover, the modern economy is largely based on science and technology and for it we need technically literate citizens with complex problem solving skills.

Sustainability pertains to a balanced interaction between a population and the carrying capacity of an environment such that the population develops to express its

full potential without adversely and irreversibly affecting the carrying capacity of the environment upon which it depends (Ben-Eli, 2004). Sustainable Development (hereinafter SD) is an issue that affects everyone and ultimately the Earth itself. It calls for a fresh vision, a new dream and new approaches for shaping an evolving new reality. Therefore UN Decade of Education for Sustainable Development (DESD) seeks to integrate the values inherent to SD into all aspects of learning. New approach to promoting scientific literacy during science education in secondary school in the context of SD is described here.

Having considered a number of existing descriptions (Aikenhead, 1997; Bybee, 1987; Roberts, 1983; Solomon & Aikenhead, 1994), the OESD/PISA (2003) defines scientific literacy as follows:

Scientific literacy is the capacity to use scientific knowledge, to identify questions and to draw evidence based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity (p.133).

Developing of pupils' capacities includes not only acquiring the main scientific concepts, comprehending the nature processes from scientific viewpoint, their diversity and commonality, but focusing on promotion of cognitive, communicative, inquiry, and social skills, too.

According to Aikenhead (2005), only small number of pupils succeed in developing a scientific worldview. The group of pupils who do not see themselves as future scientists, engineers or science teachers do not think as scientists. They experience school science as a foreign culture (Aikenhead, 2005). Most often, traditional science content is not directly applicable in everyday situations, pupils do not see it as personally significant and their level of motivation is low. The traditional science instructor concentrates on teaching factual knowledge, with implicit assumption that expert-like ways of thinking about the subject comes along for free or are already present.

To promote pupils' scientific literacy, it is necessary to transform traditional science content: deconstruct and then reconstruct it into knowledge differing from traditional science, namely, to integrated science and find out relevant social and individual context. According to Solomon and Aikenhead (1994), the pupils strive to understand their everyday experiences. The pupils integrate their personal understandings of their social, artificially constructed, and natural environments and will need to understand the interactions between science, technology, and society. Teaching science through science-technology-society (STS) aims to help the pupils make sense out of their everyday experiences, and does so in the ways that support pupils' natural tendency to integrate their personal understandings of their social, technological, and natural environments. For future citizens, understanding the interrelationships of science, technology, and society in the context of SD may be more important than understanding the scientific concepts, facts, and laws. This goal, first of all, creates the necessity to find out new approaches to the design of science curriculum and, secondly, asks to ensure the professional development of teachers so that they are able to use a learner-centred and teacher-facilitated approach envisaging multidisciplinary links with science knowledge in daily life and it's importance in SD.

Secondary school natural science curriculum in Latvia historically has been dominated by discipline-based content and during past 50 years it was isolated from student

needs, interests, and experiences. The new democratic education system in Latvia has given students an opportunity to choose the educational program in secondary school. It allows educators to develop student's abilities and interests at their full extent so that they may gain experience for life in a contemporary society. Upon introduction of the possibility to choose the educational program at the beginning of secondary education in school year 1999/2000, the urgent issue was to find the best way for science curriculum implementation for pupils who have selected humanitarian, social, or vocational education programs. Some models such as the *Natural Science Education Standard Project* or recommended *Program* prepared by the National Centre of Educational Content and Examination were based on acquiring learning content – scientific concepts, facts, laws, some technologies, few theories, which describe natural phenomena. However, such learning content is not significant for young people today because traditional school science attempts to socialize them into a scientific way of thinking and believing.

Integrative and contextual approach to the design of natural science curriculum

Teachers must understand a large disparity between science as a way of cognition and scientific way of learning that pupils use at school. A scientist is an expert in one area of science who uses the scientific method to conduct research for giving answers to unknown problems from a rational, strongly scientific perspective. But the goal of science education is to develop pupils' capacities to function as responsible citizens in a world increasingly affected by science and technologies in the context of SD. A lot of cognitive research has stressed that people learn by creating their own understanding and need to develop these different ways of thinking by means of extended, focused mental effort (Wieman, 2007).

The difference between a scientist's view of nature and a pupil's view of the everyday world defines a fundamental difference between the traditional science curriculum and an integrated science curriculum. The principle of integration and systemic approach are the general conditions for designing a new composition of school science content aiming to achieve multidimensionality of scientific literacy in the context of SD. The principle of the integration is based on the principles of unity and diversity of nature. Only human beings fragment nature in their minds for cognition and awareness.

Integrative approach focuses on more general phenomena bringing their content together in order to create a view integrating interactive processes of ecosystem and spiritual principles (Salite, 2000). Spirituality is the dimension of education focusing on the development of intelligence/thinking/learning and creating the individuals' arrangements of context, space and time (Salite, 1998).

The role of context is emphasized by many researches. Campbell's and his colleagues (1994) argument to set science in context, has not to be seen solely as a means of motivating more students to study science. It also expresses a desire to provide students with a more authentic picture of science, and of its role in people's lives, and encourages them to connect science learning with the rest of their lives (Campbell et al., 1994).

Regarding "the importance of context and structure" Bruner (1960) has said:

... the curriculum of a subject should be determined by the most fundamental understanding that can be achieved by underlying principles that give

structure to the subject. Teaching specific topics or skills without making clear their context in the broader fundamental structure of a field of knowledge is uneconomical in several deep senses. In the first place, such teaching makes it exceedingly difficult for the student to generalize from what he has learned to what he will encounter later. In the second place, learning that has fallen short of a grasp of general principles has little reward in terms of intellectual excitement (p. 31).

Context is specific; science is general. Context is merely a tool, not the goal; it is the starting point of the learning process. In other words, the contextual approach stresses connecting learning with the real world. Psychologists – including Lev Vygotsky and his colleagues Alexander Luria and Aleksei Leont’ev – have argued that cognition does not exist outside the life process that in its very nature is a material, practical process. The reflection of reality arises and develops in the process of the development of real ties of cognitive people with the human world surrounding them; it is defined by these ties and, in its turn, has an effect on their development (Leont’ev, 1978).

Contextual Teaching and Learning (CTL) is based on situated cognition research which has found that constructivist processes such as critical thinking, inquiry learning, and problem solving should be situated in relevant physical, intellectual, and social contexts (Glynn & Winter, 2004). According to contextual learning theory (CORD, 2007), learning occurs only when students (learners) process new information or knowledge in such a way that it makes sense to them in their own frames of reference (their own inner worlds of memory, experience, and response). CTL is a constructivist approach to learning in that it focuses on knowledge that is highly contextualized and relevant to students. This approach to learning and teaching assumes that the mind naturally seeks meaning in context, that is, in relation to the person’s current environment, and that it does so by searching for relationships that make sense and appear useful. In such an environment, students construct meaningful relationships between their previous understanding, ideas, scientific concepts, and practical applications in the context of the real world, and SD. The contextual approach recognizes that learning is a complex and multifaceted process that goes far beyond drill-oriented, stimulus-and-response methodologies (CORD, 2007). The learners have an opportunity to select and transform information, construct hypotheses, and make decisions, relying on a cognitive structure to do so. This implies opportunities for authentic, inquiry-based learning activities in which the learner extracts meaning from experience. It implies the implementation of an integrated, systemic, and contextual approach for creating natural science education curriculum.

The science content integrates cognitive, personal, and social dimensions of education. The cognitive dimension includes experimental knowledge, hypotheses, scientific theories, laws, and empirical observations, as well as the values that underlie them (for example, accuracy, coherence, fruitfulness). The personal dimension encompasses the intellectual capabilities of each individual such as critical thinking, logical reasoning, creative problem solving, and decision making in daily life. The social dimension incorporates social responsibility in collective decision-making and presupposes the responsible action on issues related to science, technology, economics, and environment. General understanding of science is important for the development of economical and ecological thinking and awareness. Decisions and actions arise from both knowledge and understanding of values.

Conception and model of integrated natural science curriculum

The conception of integrated natural science curriculum is based on well-known hierarchical structures of physics – micro-world, macro-world, and mega-world. This approach allows integration of the main concepts and regularities of physics, chemistry, biology, geography, and astronomy in the context of interaction between human beings, society, technology, and the environment.

The integrated natural science curriculum was created gradually. As the first step, the author of article created an integrated physics curriculum for humanitarian and social education programs containing following units: 1) Introduction. Science as the experience of humanity; 2) Universe and gravitation phenomena; 3) Structure of matter and its properties; 4) Energy; 5) The concept of balance; 6) Waves; 7) Radiation (Ионане, 2000: 38). This experimental program was implemented in several secondary schools of Latvia since 2000.

During the second step the author acted as the expert for the EU/ESF project *Production of Educational Content and Promotion of Teacher's Qualification in Science, Mathematics and Technology* and participated in designing integrated natural science education standards and curriculum. The group of experts consisted of four physics teachers, four chemistry teachers, and three biology teachers. The discussions helped to select the concepts of physics, chemistry, biology, geography, and astronomy significant for every person and to structure them into integrated themes. The sequence of themes has been chosen in order to create a necessity to refer to the previously acquired knowledge, thus realizing the spiral principle.

During the third step the tasks for the simultaneous development of skills, attitudes and individual, social, economical, and ecological context of scientific knowledge were determined. Some examples of different contexts for creating attitudes as the main aspect of scientific literacy are shown in Table 1.

Table 1. Integrated nature science units and some context examples

	Integrated units	Some examples of social and individual context
Micro - world	Invisible living micro-world	Importance of cell research in medicine. Diversity of micro organisms, importance of biotechnology.
	Structure of matter	Importance of the discovery of radioactivity. Development and importance of nanotechnologies in the contemporary world.
	Non organic and organic substances	Importance of rational use of natural resources. Influence of technologies on the environment.
	Kinds of materials and their properties	Using different materials in daily life and their properties. Necessity of sorting out and recycling waste.

Sequel to Table 1 see on p. 50.

Sequel to Table 1.

Macro-world	Motion and interaction	Necessity of awareness of security measures and risk factors in the movement of carriers.
	Fluids in nature, household and technology	Necessity of awareness of the rules of work safety in the work with domestic chemical substances. Physical principles of water supply systems.
	Gases in nature and household	Using gases in household, food industry, and medicine. Atmosphere pollution.
	Factors influencing human health	Awareness of the influence of addictive substances on humans.
	Organisms and the environment	Awareness of the importance of protected nature objects in preserving the diversity of species.
	Evolution and genetics	Evaluating the role of modern technologies in the exploration of evolutionary processes. Influence of the achievements of modern genetics on humanity and their ethical aspects.
	Energy in nature and technology	Different ways of energy production and energy sources. The influence on the environment and perspectives for alternative energy sources. Work safety using electric equipment.
Mega-world	Radiation	Awareness of the influence of electromagnetic radiation on human health.
	Structure and exploration of the Universe	The notion about systems in the Universe. The role of investigation of Universe. Attitude towards astrology as a non-scientific discipline.
	Fundamental interactions	The evolution of scientific theories. The role of science in sustainable development.

During the first year of secondary school integrated natural science, the curriculum is focused on the main concepts characterizing the micro-world. The last theme “Kinds of materials and their properties” serves as a bridge between the micro-world and the macro-world and provides an opportunity to acquire the theme in strong connection with daily life. During the second year pupils can acquire the main aspects of macro-world. The curriculum for 12th grade comprises the main themes common for all natural science disciplines such as evolution, energy, and main aspects of the Universe.

Methodology of the study

The group of science teachers (N=22) was introduced to innovative ideas on aims, content, strategy and methodology for science education during seminars and encouraged to test the new approach in their classrooms. The seminars were organized within the framework of Project coordinated by the National Centre of Educational Content

and Examination. The participants of this group were physics, chemistry, and biology teachers with experience in pedagogical work. They were selected from secondary schools or gymnasiums from all regions of Latvia.

The purpose of the research was to explore teachers' views about a new approach for a science curriculum after two years of practice. The study solicited the teachers' opinions on their realization of the principles of integration and the contextual approach in science teaching/learning process, and their role in process of science education changes. The sample consisted of 16 teachers who had participated in the approbation of natural science curriculum in grade 11, and six teachers who implemented this curriculum in grades 10 and 11. Teachers were asked to fill out a survey consisting of seven statements, by answering *Yes*, *More yes than no*, *More no than yes*, or *No*. The teachers wrote their comments about each of the statement recalling their practice.

One of the most essential criteria of the quality of curriculum is the learning achievements of pupils. In spring of 2007, four classes from secondary schools and gymnasiums (n=93) who were taught natural sciences by an integral approach participated in diagnostic testing. The same test was performed by the pupils from three control classes (n=68) for whom the natural sciences were taught in traditional way. Teachers of natural science working with experimental classes were supplied with recommendations and practical suggestions how to use the contextual approach in order to master the curriculum of natural science.

The test contained integral tasks aimed to discover the level of pupils' knowledge, formal (algorithmic) skills and higher order cognitive skills (ability to analyze, create, and evaluate) (Zoller, 1995). The tasks – tools for measurement – asked for explanations of the natural and technical processes, the conditions of these processes and determining factors. The test measured students' skills for using verbal and visual information to create and use models. The tasks were aimed to test the pupils' skills in transferring their knowledge about natural sciences to new situations, and to show comprehension dealing with complex tasks. The pupils' achievements after two year's experimental work were analyzed considering six levels of cognitive competences according to Bloom's taxonomy (L1 – remember facts, concepts, and terms; L2 – understanding of scientific concepts; L3 – ability to apply knowledge, L4 – ability to analyze; L5 – ability to create; L6 – ability to evaluate) (Bloom, 1956). The test results were analyzed quantitatively using SPSS software.

Results of research

Teachers' survey

Table 2 reflects the distribution of teachers' answers on seven statements included in the survey on teachers' views on implementation of integrated science curriculum and importance of contextual approach during learning process.

Table 2. Teachers' views on the main aspects of integrated science curriculum

#	Statement	Yes (%)	More yes than no (%)	More no than yes (%)	No (%)
1.	For the understanding of nature and promoting scientific literacy, the integrated approach for science teaching and learning is more rational.	31	50	19	–
2.	Pupils' motivation increases when they learn socially important themes that are relevant to natural science.	63	37	–	–
3.	The pupils understand the content of science more deeply if it is logically generated by the daily life context.	38	56	6	–
4.	Tasks related to real life develop pupils' abilities to use their knowledge in daily life better than traditional tasks aimed to sustain the knowledge.	63	31	–	6
5.	Tasks related to real life and connected with humans develop responsibility in pupils.	31	63	6	–
6.	Every pupil can acquire the style of scientific thinking.	44	44	12	–
7.	Teaching integrated natural science is more difficult than teaching the familiar subject.	38	56	6	–

The teachers' answers were analyzed considering three aspects: 1) their opinions about the changes in organization of natural science content inferred from the practical implementation of this content; 2) teachers' opinions about innovative approaches to the organization of teaching/learning process; 3) problems concerning the implementation of integrated science curriculum and constructivist learning strategies.

1st aspect: changes in organization of natural science content. The majority of science teachers accept the concept of an integrated approach to science teaching/learning in humanitarian and social or vocational education programs. They distinguish the two main benefits of contextual approach: science education goals are related to SD and pupil's motivation towards meaningful learning.

2nd aspect: teachers' opinions about innovative approaches. The majority of teachers are aware of the necessity to introduce new learning strategies in order to reach the educational goals. Only few teachers would like to use traditional content-centred approach more often, because they have a rich experience with this approach and they are quite reluctant to introduce innovations. Traditional science knowledge itself is not a value for pupils. Referring to the experience of many teachers, pupils would like to see the significance of science knowledge in their daily life and its' applicability for real life problem solving. Therefore, teachers accept the necessity to choose and analyze pupils' everyday experience and socially important themes related to science. A contextual approach increases pupils' contribution to their learning about different issues. It is key

to acquire the main scientific concepts, cognitive and social skills, and to form attitudes. It creates the possibility to shape learners' responsible actions on issues related to science, technology, economics, and environment. All of these aspects are important to promote scientific literacy. The majority of teachers considered the necessity for pupils to acquire a scientific thinking style. According to Aikenhead (2005), the majority of pupils do not think as scientists. They do not want to think like a scientist, but they like to learn by using traditional scientific methods – observation, experiment, and inquiry. Probably for many teachers, *scientific thinking style* is associated with introducing learner-oriented and inquiry-based learning activities.

3rd aspect: problems associated with the implementation of integrated science curriculum and constructivist learning strategies. The survey shows that the teachers comprehend the necessity of reforming the science curriculum in order to promote the scientific literacy in the context of SD. The survey indicates the difficulties encountered by some teachers: there are many good initiatives in organizing science education, but to implement it, they must learn many things themselves. They had to evaluate all science themes and choose the most suitable teaching strategy, too. Some teachers had difficulties with finding out an appropriate context regarding pupils' interests, science content, and society's needs. The majority of the teachers indicate the necessity of qualitative teaching/learning aids.

Learning achievements of pupils

The results of pupils' diagnostic testing obtained in control and experimental groups revealed statistically significant differences on four levels of pupils' cognitive competence. The differences are confirmed regarding the pupils' knowledge of facts, concepts, and terms (L1) and creative or higher level cognitive skills (L4; L5; L6). However, there are no statistically significant differences in understanding of scientific concepts (L2) and ability to apply knowledge (L3).

Table 3. Experimental (E) and control (C) group independent sample test statistics

Group	Level	Mean	Max	St. deviation	t-test for equality of means		
					t	Mean difference	Sig. (2-tailed)
E	L1	3.78	5	0.81	-4.75	0.71	p=.000 < α =.005
C		3.07	5	1.03	-4.93	0.71	p=.000 < α =.005
E	L2	2.69	4	1.09	1.22	-0.18	p=.224 > α =.005
C		2.87	4	0.77	1.16	-0.18	p=.248 > α =.005
E	L3	1.61	3	1.12	0.70	-0.11	p=.488 > α =.005
C		1.72	3	0.84	0.67	-0.11	p=.507 > α =.005
E	L4	2.30	4	0.95	-4.67	0.74	p=.000 < α =.005
C		1.56	4	1.03	-4.72	0.74	p=.000 < α =.005
E	L5	1.55	3	0.81	-7.07	0.89	p=.000 < α =.005
C		0.66	3	0.77	-7.00	0.89	p=.000 < α =.005
E	L6	1.04	2	0.88	-3.64	0.44	p=.000 < α =.005
C		0.60	2	0.65	-3.48	0.44	p=.001 < α =.005

The distribution of the correct answers to the L1 questions in the group C corresponds more to the normal distribution in comparison with the group E where 66% of pupils have given four or five correct answers. In the group C such result is observed only for 35% respondents. It could be explained by larger number of pupils from the group E accurately repeating concepts and terms before the test.

The mean level of remembering facts and terms for the pupils from the group E is 75%, but for the pupils from group C – 61%.

The understanding of scientific concepts was measured by L2 questions, and ability to apply knowledge – by L3 questions. The mean level of understanding of the scientific concepts is 67% in group E and 72% in group C, ability to apply knowledge – 54% in group E and 57% in group C. The difference of L2 and L3 results in both groups is not statistically significant.

The pupils from group C show slightly better results in understanding and usage of knowledge completing formal tasks than group E. It means that the low order cognitive skills (to use knowledge in standard situation) are mainly developed by traditional science teaching/learning process since the level of creative or high order cognitive skills for this group is low. Keeping in mind that for group E creative skills have reached a higher level, the low order cognitive skills for this group is about the same as for the group C.

However, the large and statistically significant difference was found comparing the performance on creative tasks or higher order cognitive skills (L4; L5; L6): the mean level of performance in group E – 54.3%, in group C – 31.3%. The pupils from the group E were much more successful in formulating a research problem about risks of breathing when mountain climber goes up to mountain. They set the research hypothesis relevant for this specific situation, got information from the text and justified the changes of breathing processes dependent on height above sea level. The statistically significant difference between the two groups in learning achievements related to the application of creative skills dealing with tasks connected with their daily life leads to the conclusion that the application of the contexts fosters the skills of pupils' creative activities.

Science teaching/learning in different classes was organized by different teachers. The ANOVA test was applied to consider the influence of teachers' personality on pupils' learning achievements regarding all levels of cognitive competence in both groups of pupils. The results of this test are shown in Table 4.

Table 4. The results of ANOVA test

Group	Level	F	Sig.
E	L1	4.26	.017 > $\alpha=.005$
C		4.37	.017 > $\alpha=.005$
E	L2	25.5	.000 < $\alpha=.005$
C		0.23	.798 > $\alpha=.005$
E	L3	1.16	.317 > $\alpha=.005$
C		0.10	.908 > $\alpha=.005$
E	L4	5.53	.005 $\geq \alpha=.005$
C		0.40	.673 > $\alpha=.005$

Sequel to Table 4 see on p. 55.

Sequel to Table 4.

E	L5	1.22	.299 > $\alpha=.005$
C		0.28	.755 > $\alpha=.005$
E	L6	0.78	.461 > $\alpha=.005$
C		0.37	.690 > $\alpha=.005$

ANOVA test shows values of $\alpha > .005$ for five levels of cognitive competence in the group E and for all levels in group C. It means that there are no statistically significant differences between pupils' achievements in different classes in both groups. The teachers' influence to pupils' achievements is not significant. Only statistically significant difference was found out between the experimental group classes testing their level of understanding of scientific concepts. Probably, some of group E teachers traditionally paid more attention also to developing pupils' skills to use scientific knowledge in standard situation.

Conclusions

An integrative approach to the natural science curriculum for pupils who will not become professional scientists, engineers, physicists, etc. is a better way for acquiring scientific literacy. The goal of school natural science is to develop responsible citizens who understand the individual and social context of science and technology. It focuses on the development of each pupil's individual potential and understanding values, not the acquisition of only a rational view of reality from a strongly scientific perspective. Diagnostic test proved a lower level of pupils' higher order cognitive skills in control classes and higher level of these skills in experimental classes. The experimental classes were taught using a contextual and integrated approach for curriculum development and organization of learning. Constructivist strategies were also implemented. The *t*-test pointed out the significant difference between the experimental and control groups. Therefore, the application of a contextual and integrated approach in science teaching/learning essentially influences the development of higher order cognitive skills such as pupils' ability to analyze, create, and evaluate. These skills are important to develop scientific literacy and are significant for daily life cognitive competences – critical thinking, logical reasoning, creative problem solving, and decision-making. These competences are necessary and possible to develop and promote while learning science.

Teachers agree with researchers' conclusions about the necessity to select a context that is meaningful for the pupil and is connected with acquired knowledge in order to promote pupils' motivation at the first steps of learning. Other aspect of contextual approach is building understanding about interactions between society, technology, and environment and developing personal responsibility in collective decision making on issues related to science and technology. However, teachers are not always ready to find out relevant or thrilling contextual examples in order to generate a natural need to acquire basic scientific concepts or illustrate the role of scientific knowledge in understanding daily life's or global problems. For teachers this approach is more difficult than to teach separate subjects. Teachers are specialized in one or two traditional science disciplines – biology, chemistry or physics. They have very little experience in teaching integrated natural science subject in connection with needs of contemporary society and our world increasingly affected by science and technologies.

To raise the awareness of a necessity to change the science education goals, more time is needed. In connection with the educational goals, changes elicit a need to select more effective content composition including advanced interdisciplinary themes, to find new methodological approach to carry out teaching/learning processes, and to create sustainability oriented science textbooks.

There is an urgent need to reconstruct models of science teacher training and to think about new approaches towards updating natural science teachers' professional education. Science educators need to renegotiate conventional school science and replace it with a school science that develops responsible citizens who understand the social context of science and technology.

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TEACHING LEFT-HANDED PRIMARY SCHOOL PUPILS IN ESTONIA

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Abstract

At the primary school level, can children distinguished by their skills/abilities be sure that by acknowledging their differences they can be guaranteed a sustainable education? To what extent are they given equal treatment? The goal of this study was to identify the number of left-handed pupils in different classes of Estonian primary school and to discover what knowledge and skills are needed to teach the left-handed children. Results show that a significant number of elementary school children (9%) are left-handed, justifying a need to pay more attention to their uniqueness. In contrast, 46% of surveyed teachers report not having the necessary knowledge and skills to teach this population. While left-handedness has not been researched much throughout the world, including Estonia, it is necessary to recognize that a significant number of students are left handed and teacher knowledge about how to anticipate and prevent their difficulties in a school setting should be taken into consideration to guarantee the success of these children at school and in everyday life.

Key words: *left-handedness; primary school; teachers; knowledge; skills; learning difficulties.*

Introduction

The Estonian Republic as a Member State of the European Union has carefully followed the tendency to become a more competitive and dynamic knowledge-based country. In 2004, the European Council approved the document *Education and Training 2010*, which grounds the lifelong learning strategy of Estonia from 2005 to 2008. The strategy provides that study motivation and access to studies needs to be guaranteed to all target groups. It is hoped that implementing the strategy will provide people who are disabled or from risk groups access to a quality education. Officially, left-handed people in Estonia are not included in these groups, but in practical life and at school these persons may need special treatment, especially in the earlier stages of education (*Lifelong learning strategy*, 2004).

Today's world focuses on improving education. Teachers need new knowledge about educational life and self-education that can arouse their interest in educational activities and help them to cope with the increasing amount of information. To warrant

sustainable education, new educational programs need to be launched (Henno, 2006). Also, Estonian universities need to initiate new training programs and in-service courses for teachers to guarantee sustainable development of teachers in Estonia (Henno, 2006). Sustainable development of teachers assumes teacher professionalism and long-term planning of professional careers, which requires the restoration of a professional, public and advanced training course system. In addition to that, personal training could be added according to every teacher's individual needs (Koppel, 2005).

Presently, special attention is being paid to the transition toward a society where the pursuit of knowledge and lifelong learning are an important part of a teacher's professionalism (Hargreaves, 2003). It is important to provide for the development and improvement of teaching competence, the teachers' ability to notice individual differences regarding development and learning, as well as the readiness to analyse and develop oneself as a teacher (Fullan & Stiegelbauer, 1991; Kagan, 1992). Only when certain pedagogical skills have been acquired can teachers consider developmental differences among children. Becoming a competent teacher is a long process that requires necessary knowledge, skills and abilities in addition to continuous improvement (Sternberg et al., 2003). Effectively joining theory and practice encourages a future teacher to acknowledge a child's developmental and cognitive differences and permits her/him to evaluate the level of a specific child and select the appropriate teaching methods and techniques (Neare & Häidkind, 2007). At the same time, no university can provide teachers with the experience, teaching practice or the ability to solve all the possible problems that can occur in class. Professional skills come with work experience, additional training and cooperation with colleagues (Koppel, 2005).

The current article develops from the viewpoint that teachers do not pay sufficient attention to left-handed pupils. The urgency of the problem comes from the need to consider every child's need to fully develop, learn and be ready to cooperate, which is important to adapt and successfully participate in a rapidly changing world. In order to provide a sustainable environment for children, teachers have to consider certain peculiarities that are not always easy to identify. One of the most common peculiarities is handedness.

Estonian teachers acknowledge that the number of left-handed children has increased considerably over the past 20 to 30 years (Kula, 2004). This, however, does not represent a growing trend. Rather, it reflects a greater individual freedom that permits students to act in accordance to their preferences, individuality and inborn peculiarities. In the sixties and even earlier, left-handers experienced unpleasantness during the school years when writing with the left hand was strictly forbidden (Laaksonen, 1985; Meyer, 1998; Sovak, 1968). Today left-handed children do not experience any such restriction at schools and can freely choose whether to use the right or the left hand.

This article is based on a research aimed at determining the number of left-handed pupils in different classes and the knowledge and skills Estonian primary school teachers have in dealing with left-handed children.

The following issues are treated in depth:

- 1) What is a number of left-handers in the researched classes and in what activities do they need teacher assistance?
- 2) How do teachers assess their knowledge and skills in teaching left-handed children?
- 3) What kind of knowledge and skills do teachers need to teach left-handed children?

Theoretical background

Left-handedness as a phenomenon

Left-handedness is the preference and ability to use the left hand more efficiently than the right hand. The activity of the right and left side of the body is different due to unequal construction of the brain hemispheres that innervate the body functions. In case of the dominance of the right hemisphere, the left hand, foot, eye, and ear are more efficient; in case of the dominance of the left hemisphere the right side of the body is more efficient (Meyer, 1998). The dominant hand is more accurate and flexible; it also expresses individual and emotional peculiarities better. The choice of the left hand does not refer to the usefulness of this hand but very often shows that the right hand is weaker, which means that many left-handers also manage well with the right hand.

Psychologist Kramer (1970) calls a person a left-hander when he/she gets better results with the left hand, in addition to when she/he prefers the left hand in activities that need good coordination, strength and accuracy (Meyer, 1998). In case of the dominance of the right hemisphere of the brain, the left hand, foot and eye are more versatile (Gaddes, 1985; Gaddes & Edgell, 1994; Meyer, 1998). So, in case of left-handedness there are sensory and motor differences in behaviour, perception, and thinking. Mostly, both left- and right-handers have their speech centre in the left hemisphere of the brain but there are left-handers who have it in the right hemisphere or it spreads over cerebral hemispheres (Gaddes & Edgell, 1994; Sousa, 2006). This is a reason that makes left-handers so different from right-handers (Безруких, 2000).

In general, for the majority of people, the right hand is more versatile; for about 10-11%, it is the left hand. The number of left-handers depends on gender, age and cultural/genetic background (Bertrand, 2006; Meyer, 1998). There are 2-3 times more left-handed boys than girls in Great Britain, Germany, Finland, and Estonia (Harris & Carlsson, 1988; Kula, 2000; Leppik, 1994; Meyer, 1998; Paul, 2002). Annett's (1964) earlier research has shown similar results. Therefore, it can be assumed that females have stronger genetic heredity of right-handedness than males (Gaddes, 1985; Gaddes & Edgell, 1994; Harris & Carlsson, 1988).

Some researchers think that left-handedness results from genetics, light damage to the left cerebral hemisphere, neurological damage during the intrauterine period or environmental conditions (Gaddes & Edgell, 1994; Kansanen & Lauerman, 1993; Koik, 2000; Leppik, 1994; Meyer, 1998; Nielsen, 1988; Paul, 2002). Left-handedness that is not connected with neurological problems is called normal left-handedness.

For successful development of a child, inborn laterality should be kept, allowing a left-hander to write and act with the left hand. Changing laterality might cause serious disabilities in development of speech and personal character (Gaddes, 1985; Meyer, 1998; Paul, 2002; Sovak, 1968).

Teachers often do not recognize the peculiarities of left-handed children well enough and do not consider handedness as an important factor that influences children's possibilities to act, perceive and think (Meyer, 1998).

Learning difficulties of left-handed children

So far there is no evidence that left-handers differ from right-handers in their specific needs or intelligence quotient (IQ). Left-handedness is not an obstacle in mental development and not all the left-handers experience difficulties (Paul, 2002). Individual peculiarities of left-handed children are considered more remarkable than those of the right-handers (Leppik, 1997; Безруких, 2000). Left-handers learn foreign languages quicker and better, their visual memory is more developed, they are more creative and very often exhibit a fighting nature (Kopietz & Sommer, 1999). Very good spatial perception is mentioned by Kõve (1997) as a favourable factor of left-handedness in learning.

However, as research conducted in Finland shows, left-handers, more than half of whom are boys, experience more learning difficulties than right-handers. The neurophysiological development of boys is slower than that of girls. Boys experience slower development of the brain, especially the left brain hemisphere; therefore the development of brain hemisphere asymmetry is also slower. The central nervous system of boys is biologically susceptible to disturbances. This explains why most left-handers are boys (Kansanen & Lauerma, 1993). It is believed that some of the difficulties are caused by writing with the left hand and sighting with their right eye (Paul, 2002).

The difficulties of primary school students may be attributed to picking up and responding to notions expressing directions in space (the left and the right side, up and down), which, in turn, makes it more difficult learning to read, write, developing mathematical skills and orientating in the environment. These children have difficulties in comprehension and they might read backwards (Kõve, 1997). Undoubtedly, learning to write is the most complicated issue for the left-handers. In addition to age peculiarities of developing coordination, left-handers also have difficulties finding the correct direction when moving their hand and creating the reflected image of a letter (Kõve, 1997). A researcher of left-handers, Paul (2002), thinks that there are no standard systems to help left-handers and the statistics shows that left-handers have more problems in the classroom than right-handers of the same age. Left-handed children might have problems in behaviour if their difficulties are not noticed and they get no help. In primary classes it is important that the teacher notices the situations where problems occur at an early stage. Solving these difficulties will help avoiding learning difficulties later which, in turn, will help the child feel more secure at school and in everyday life and support her/his future academic development.

Method

Skills and knowledge in teaching left-handed children was studied in Tallinn and Harjumaa in the spring of 2004. The sample consisted of 28 classroom teachers from five schools, teaching children from 7 to 11 years of age in grades 1–4 in regular classes, remedial classes, in classes where English was taught more extensively and classes where music and dance were more advanced. Six of the teachers had the special education teacher and speech therapist qualifications and they taught in remedial classes. Other teachers had the classroom teacher certification.

The semi-structured questionnaire consisted of 25 (multiple choice and open ended) questions that were divided into thematic sections:

Section 1. Teachers were asked to name the total number of pupils in their class as well as the number and gender of the left-handed and right-handed children;

Section 2. Teachers gave their evaluations on the coping of left-handed and right-handed children while acquiring basic skills in reading in Estonian, in orthography, handwriting, mathematics and craft (in the school year of 2004). The evaluation was given on a five-point scale, where: 1, 2 – difficulties appear, 3, 4 – manages, and 5 – manages very well. Teachers were asked to point out the main difficulties acquiring learning skills upon providing their evaluations;

Section 3. Teachers evaluated their own knowledge and skills on a three-point scale (1 – have no knowledge, 2 – have some knowledge, 3 – need more knowledge) in teaching left-handed children.

In addition to what help left-handed children need at school, the following aspects were studied: how have teachers managed to help left-handed children; which skills have proven to be difficult to teach; which teaching skills and knowledge need further improving; what sources have teachers used to get information about left-handedness; which aids for left-handed children were the teachers aware of. Teachers could also add their observations concerning different aspects they have come across while teaching left-handed children.

In general, a quantitative data analysis method was used in the study. In order to code the answers for open ended questions, an overall frequency chart was formed to show the frequency different categories occurred.

Results of the survey

Percentage of left-handers in different types of classes

The analysis showed that the teachers, involved in this study, guided 615 pupils: 328 boys and 287 girls. Fifty-seven of them were left-handed which is 9% of all pupils. Thus, it could be claimed that every tenth pupil is left-handed. In every school of 300 pupils approximately 30 of them (one full class of pupils) are left-handed. The studies by Paul (2002) and Leppik (1997) confirm these results. In the current research there were 38 boys and 19 girls among left-handed children (6% and 3% respectively). This shows that there are approximately twice as many left-handed boys than left-handed girls. Several earlier researches confirm these results (Gaddes, 1985; Kula, 2000; Leppik, 1994; Paul, 2002; Sattler, 1995; Sovak, 1968).

The distribution of left-handed children in different types of classes points to their abilities, interests and success, which is very important to know for primary school teachers. Learning in a special class presumes higher interest, talent and skills in the field that teachers have to consider:

- In music classes 7.4% are left-handers (3.4% boys and 4% girls);
- In classes of English language 9.6% are left-handers (6.6% boys and 3% girls);
- In dancing classes 7.2% are left-handers (4.5% boys and 2.7% girls);
- In general classes 8.6% are left-handers (5.4% boys and 3.2% girls);

- In remedial classes 16.1% are left-handers (14.3% boys and 1.8% girls). This is twice as much as in traditional classes.

Thus, approximately 8.2% of left-handers study in music, dancing, general and English classes, 16.1% in remedial classes. It is evident that in general education classes with a large number of pupils the child may lack attention, thus the risk of being neglected might increase. Therefore a smaller class guided by a special education teacher might surely be beneficial as they have more experience of teaching left-handed children.

Activities of left-handers inviting teachers's help

The questionnaire gave an overview of how much teachers notice left-handed pupils at school, what help is needed, and how can teachers support such children. When analysing the teacher evaluation on the success of left-handed children at general school in grades 1–4, it became evident that 40% of left-handed children in general manage on their own, but 60% of the left-handers and 45% of the right-handers need teacher help.

The school subject that causes the most difficulties for left-handers is script technique: in grade 1 40% of the left-handers have difficulties with this, in grade 2 – 38%, in grade 3 – 82%, in grade 4 – 27%. In general, 49% of the sample show some degree of difficulty, proving that writing is the most difficult subject (skill). One reason for this is that teaching writing the teacher proceeds only from the methodology of teaching writing to right-handers leaving the left-handers in a position to manage on their own. This is significant because difficulties in learning script technique might contribute to learning difficulties in general.

Mathematics causes difficulties for 26% of the left-handers in the given sample. This might be because primary school age children have problems with spatial perception. One of the main difficulties is picking up and responding to notions expressing spatial perception such as “left-right” and “up-down”. In manual training 23% of left-handed children have difficulties that could be explained by the teachers showing the main techniques (of knitting, crocheting, embroidering) from a right-handed perspective. Left-handed children have difficulties cutting with scissors. Approximately 46% of the teachers think that they are not able to teach the most important manual techniques to left-handed children and 21% of the teachers know that when teaching left-handed children, it is wise to sit facing them. When the child sees the activity in reflection it makes it easier for him/her to follow. If the teacher is left-handed he/she usually knows the relevant techniques.

Reading skills are relatively low in grades 1–2 and they cause difficulties to 21% of the left-handed children. Sometimes a child can start reading words backwards or from the end of the line. So the child acquires reading skills indirectly using spatial knowledge and feeling his/her own body (left-right/up-down). Reading skills improve in grade 4 where almost no difficulties occur.

Various difficulties are mostly connected with perception of directions and handedness, which requires accuracy and coordination skills. Problems occur in script techniques, handicrafts, and art. In these subjects, a child needs individually adapted guidance.

The data show that left-handed children experience more learning difficulties at primary level than the right handers of the same age. Research by Gaddes and Paul confirms that left-handers have more learning difficulties and points out that left-handed children's brain hemisphere functions might develop later, which also explains the slower progress in elementary school (Gaddes, 1985; Gaddes & Edgell, 1994; Paul, 2002).

Knowledge and skills of teaching left-handed children

Teachers themselves are not satisfied with their knowledge of teaching left-handed children. Only 3.6% of the teachers claim that they have sufficient knowledge on this topic. About a half (46%) of the respondents need more knowledge in this field. A large number of teachers – 39% could not evaluate their knowledge.

Teachers were asked to name where they could find information about the topic. Twenty-five percent of the teachers said that they have no information about this topic and it was not dealt with during their teacher training. Twenty-one percent of the teachers claimed that they use their own teaching experience. Eleven percent of the teachers did not answer the question. A large number of teachers (43%) mentioned that they have received information from magazines, books, training courses, school, colleagues, doctors, and special education teachers. Teachers stressed that there is a lack of teaching materials to acquire information about the guidance of left-handers.

Thirty-two percent of the teachers think that the percentage of left-handers has risen, but 7% think this is because left-handers are no longer being forced to retrain. Teachers (14%) also were unaware of any special tools designed for left-handers. Twenty-five percent of the respondents knew about scissors for the left-handers and the exercise book *Preliminary Exercises for a Left-handed Child*. Sixty-one percent of the teachers knew only about the scissors. The lack of information about the exercise book is regrettable as teachers could get necessary advice on how to guide left-handers when teaching writing. Teachers also lack information about special three-faced quickly drying pens and the right pencil grip. It became evident that only a few teachers have directed left-handers to start using the right hand. In general teachers know that left-handers cannot be retrained.

The data show that 50% of the teachers pay attention to left-handed children. Teachers have tried to help/guide children when learning to write and to manage with other handwork activities. Children have needed teachers' help in learning letters, combining them, learning script techniques, using scissors, and realizing activities that require speed and accuracy (holding a pencil, knitting, and crocheting). Only a few teachers (3.6%) could explain how they have helped left-handers. The majority of the teachers lack these skills.

It became evident that teachers want for teaching materials that could provide instructions for teaching handicrafts to lefthanders. Teachers mentioned that they lack practical skills to teach knitting and crocheting, therefore they just do not teach them. If the teacher is left-handed, he/she has natural skills to show methodologically correct moves. Teachers have tried to help left-handed children with script technique, letter shapes, correctly gripping pen, using scissors, knitting, crocheting and woodwork.

The results are not final and further research is needed. At the same time the results show that improving teacher awareness of left-handed children and providing proper teaching should be stressed more.

Conclusions

According to the survey, 9% of pupils taught by the studied teachers were left-handed. There are twice as many left-handed boys than girls.

As the research shows, left-handed children in general classes succeed in learning foreign languages, music, art and have good results in sports. Kopietz and Sommer (1999) confirm the same saying that they are more creative and possess a better visual memory, which helps develop reading and mathematical skills. Most of the difficulties occur when these children learning to write. Left-handers who experience persistent learning difficulties are often sent to a remedial class.

According to the theoretical research of Gaddes (1985) and Paul (2002), the reason for persistent learning difficulties is slower mental development, which can be due to physiological peculiarities of a child whose brain hemisphere functions develop later. In traditional classes that are characterized by a large number of pupils, left-handed children are sometimes left without a proper attention and support, which might increase the risk of being neglected and harm their personal development.

Teachers claim that they need additional knowledge to better teach left-handed children. Knowledge and practical skills are needed the most when teaching writing and handicrafts (knitting, crocheting, and embroidering) to pupils. Currently, at the university level, the curriculum does not provide sufficient theoretical and practical knowledge/skills to teach left-handed children.

Elementary level school teachers have to cooperate with parents and explain the peculiarities of raising left-handed children. It is important for teachers to notice the difficulties left-handed children might encounter. Trying to solve the problems at an early stage will provide security for the child in his/her everyday life, help to avoid later learning difficulties, and support the development of the child in his/her future life. Left-handed child often needs individual guidance and proper teaching methods that should also be introduced to parents. Teachers cannot give any guidance to parents if they lack knowledge about left handedness and the development of these children.

The survey shows that teachers have insufficient knowledge and skills to support left-handed children sufficiently. Estonian teachers need practical training to better guide left-handed children. Furthermore, they require more pedagogically and psychologically grounded information concerning left-handedness. Teachers need to have competence to support a child's peculiarity and proceed from the actual level of a specific child in choosing study methods and techniques. Thus, contemporary teachers are in need of wide-ranging self-education, which is the basis for the professional development of teachers and the formation of teaching competences. The *Guidelines for Inclusion: Ensuring the Access to Education for All* (2005) published by UNESCO Educational Sector contain the Index of Inclusive Schooling that presents several items directly related to the sustainable education of left-handed children. For instance, such imperatives as "teaching and learning are planned with all pupils in mind", "pupils experience success in their learning" or "difficulties in learning are seen as opportunities for the development of practice" can provide the justification and framework for further work in this direction.

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CAREER EDUCATION FOR TEACHERS: REFLECTIONS ON ESF PROJECT IMPLEMENTATION IN LATVIA

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Abstract

In Latvia, the issues of career education are most often addressed by school teachers. In 2003, the Standards of Teacher Profession adopted by the Ministry of Education and Science of Latvia provided the list of teachers' duties, tasks, and specific skills. One of such skills is to help pupils to understand the professional activities and to teach them career planning. This issue is given insufficient attention in teacher professional education. The article aims to use the context of sustainable education to analyze the activities carried out within the National Program Project "Career Education Activity Provision in the System of Education" co-financed by the European Social Fund. The questionnaires were designed to determine the needs for teacher education in relation to learner's career education. The data were obtained from in-service teachers (N=228) involved in career advising activities for their pupils in all regions of Latvia and were analyzed both qualitatively and quantitatively. The results approve and elaborate on a necessity of integrating career education issues in the teacher education curriculum.

Key words: teachers; career education; general education; vocational education; educational needs.

Introduction

One of the directions stated in the *Basic Positions of Educational Development of Latvia for 2007-2013* to achieve the goals of education policy is the necessity to improve youth career education so as to motivate them to acquire further education and guide their career development. It has been planned to include career education in the long-term educational work program and facilitate teacher professional development for teaching career education in Latvia (*Izglītības attīstības...*, 2006).

The European community has expressed an intention to promote the formation of a Lifelong Career Support policy network. This initiative has been undertaken by 28 European states, including Latvia. By means of the open coordination, the network participants are to identify and define their common goals, apply the common indicators for measuring success, stimulate innovations, exchange the examples of positive practice, and develop mutual learning (*Jauns sadarbības tīkls*, 2007).

Since 2004, career education issues in Latvia have been in some way integrated in different stages of the educational system, initially as the requirements set forth in the normative documents of the Ministry of Education and Science. Hence, the section related to special professional skills of the Teacher Profession Standards (2004) adopted by the Ministry of Education and Science, describes the skills necessary for school teachers to provide career education at diverse stages of education. For example, at the primary education stage, the teacher needs skills to provide information on the possibilities of a profession and on career choices and ability to determine the pupils' aptitude and to enhance their talents; at the stage of general secondary education, the teacher needs skills to motivate pupils toward a conscious choice among career options. Furthermore, for vocational education teachers, the skill to cooperate with employers is emphasized along with the ability to reveal a link between career growth options and the acquired study program, thus binding the theoretical and practical components of the learning process (*Profesiju standartu reģistrs*, 2004).

The analysis of legislation and activities in the sphere of career (*Koncepcija "Karjeras attīstības atbalsta..."*, 2006; *Mūža ilgumā pieejamu...*, 2006) shows to the rapid growth of career education in Latvia; yet it is the teachers' responsibility to react to these changes and carry out the career education in practice. Though teachers are open to changes, the formal decisions are sometimes hasty and their practical application immature.

Standardization in education and career education generally ignores the multifaceted school context, disregarding the needs of learners and their teachers. According to Kincheloe (2003), it is necessary to help to develop the research skills of teachers so that they might become the initiators of change in education. It is also essential to assess the decisions taken on the national scale with respect to professional development courses and the associated higher education studies in order to help teachers prepare for their professional activities in the sphere of career education.

To implement career education, there is a need for qualified professionals and support from diverse institutions. Cooperation with community partners is of a major importance in career education; for instance, employers' opinions help to determine the competences necessary for the potential specialists.

Today education of any kind and, specifically, career education should entail the context of sustainability where the quality of education is measured according to the criteria of flexibility and adaptability; interdisciplinarity or transdisciplinarity; collaboration; experience; holism; local relevance; problem solving; future-orientation; action-orientation; learner-centeredness; system approach (Fien & Tilbury, 1996: 70; NSW EPA, 1996: 20, quoted by Institute of Environmental Studies, 1999: 16). Implementation of these criteria in career education would mean, among other that the content of the program would address both local and global needs. Nevertheless it is often rather difficult to adopt these criteria in formal education, because to implement the sustainable education, well-considered innovations in education policy, in educational documents and in teacher training programmes are needed in advance. Integrating the principle of sustainability in career education that entails planning and implementing solutions for future problems, the interaction of previous experience and social, economic, and environmental contexts also have to be considered (Grabovska, 2006).

In 2005, ESF National Program 3.2.7.1. *Support for Implementing Career Guidance and Career Education in the System of Education* initiated the project *Career Education Program Provision in the System of Education* (CEPPSE) aimed at

promoting the availability and quality of career guidance services and career education at education establishments of all levels and kinds in the context of life-long education by creating the system of career guidance professional qualification acquisition and development, improving the teaching and informative material provision in career education (ESF National Program Project CEPPSE, 2007).

The project was targeted at Latvian teachers and other education professionals involved with the activities of career guidance and career education and implemented from June 2005 to December 2007. The course and the results of this project are reflected in the four stages of project activities:

First stage of activities (July 2005 – September 2005) envisaged to (1) determine the needs of teacher/career guidance professional education in all regions of Latvia; (2) discover the difficulties teachers face in the process of organizing and administrating career guidance and career education activities for diverse age groups; and (3) design the recommendations for creating a structure of teacher/career guidance professional further education program for diverse age groups.

Second stage of activities comprised the elaboration of program and designing of teaching aids for teacher further education.

During the **third stage of activities** the project team implemented the teacher further education program and evaluated the results of this program.

Fourth stage of activities, characterised in this article in brief, envisaged the creation of informative materials as well as online and electronic project related resources involving the experts from comprehensive schools, vocational schools, and higher educational establishments of Latvia.

Thereby, the present article in its core reflects on the results from studying teacher education needs and activities in career education that in its turn provides a proposal for elaborating and implementing teacher further education program.

First stage of project activities: Determining the needs for teacher education

Research methodology

The project activity *Designing the Basic Course and Specialized Courses of Teacher/ Career Guidance Professional Education and Presentation of the Results* was supervised by academic staff from the Daugavpils University. Project team participants from all regions of Latvia were then involved in data collection. A questionnaire was completed by a total of 228 teachers and career guidance professionals from Kurzeme, Vidzeme, Latgale, and Zemgale regions of Latvia (see Table 1) involved in career guidance and career education activities for grades 7–9, secondary school, and vocational schools. Twenty-three questionnaire forms were clearly misunderstood by the receivers; therefore the research results reflect the replies from the remaining 205 respondents.

Table 1. Distribution of respondents according to the region and place of work

Region	Respondents' place of work				TOTAL
	Comprehensive schools			Vocational schools	
	Primary schools (Grades 7 – 9)	Secondary schools	Primary schools (Grades 7 – 9) and secondary schools		
Kurzeme	22	2	13	1	38
Vidzeme	31	14	14	7	66
Latgale	25	9	1	7	42
Zemgale	33	10	8	8	59
TOTAL	182	23	205		

The data were analyzed by dividing respondents in two groups – the teachers from the comprehensive schools (n=182) and vocational schools (n=23). The number of respondents in these groups was determined by the proportion of comprehensive and vocational schools in Latvia.

The questionnaire focused on the needs of respondents in the sphere of career education. It consisted of 12 statements as well as allowed space to express one's opinion and comments for enriching work in career consultancy. Therefore, the research data were analyzed both in qualitative and quantitative way. Respondents were asked to evaluate the importance of statements on a 3-point scale, where 1 point means *not important*, 2 – *difficult to say*, 3 – *significant*. The authors calculated the average and weighted average for the importance of each of 12 statements in different groups of respondents. While evaluating the expressed importance of stated needs, it was assumed that the average from 1 to 1.95 points to rather unimportant of unimportant needs, but the average from 2.05 to 3.00 means that these needs were considered as important. The average from 1.96 to 2.04 (2±0.05) indicates to the needs that were difficult to evaluate.

All statements from the questionnaire were divided into two content aspects: theoretical and practical. The former includes statements related to the necessity of more extensive theoretical knowledge for organizing career education activities (1; 2; 3; 5; 11). The latter includes statements related to the necessity of practical skills (4; 6; 7; 8; 9; 10; 12).

Table 2. Statements of questionnaire

Theoretical knowledge statements	Practical activities statements
(1) Knowledge on relationships between individual peculiarities and requirements of diverse professions;	(4) Skills to determine pupil/learner's professional interests;
(2) Knowledge on how to determine the professional compatibility;	(6) The ability to determine the compatibility of pupil/learner's motives with the profession requirements on the part of community;
(3) Information on pupil/learner's professional motivation;	(7) Skills to determine the specific requirements of professions;

Sequel to Table 2 see on p. 72.

Sequel to Table 2.

(5) Knowledge on the contemporary professions obtained from the manuals for different professions;	(8) Skills to design educational and diagnostic programs in the field of career education;
(11) Skills to create non-conflicting program (suggestions) to reorient vocational students for another, more appropriate profession.	(9) Skills to design career education program for diverse age groups;
	(10) The ability to foster the pupil/learner's conviction about the appropriate choice of profession;
	(12) Skills to assess the efficiency of career education activities.

In order to calculate the statistical significance of differences between two independent samples and two groups of statements (theoretical and practical) Mann-Whitney criteria were applied. Comments and recommendations of respondents were analyzed qualitatively evaluating the content of expressions.

Results

The analysis of data indicates that there is no statistical difference in respondents' answers among four regions of Latvia ($p < 0.05$), therefore all the obtained data was analyzed considering the specifics of the groups of respondents and the classification of statements. Answers of teachers from *comprehensive education* show that it is urgent to enrich their knowledge of determining professional compatibility (2.92 on average), develop skills to determine pupil/learner's particular professional interests (2.75), gain more extensive knowledge on the relationships between individual peculiarities and requirements of diverse professions (2.67), acquire more information on pupil/learner's professional motivation (2.47), develop the ability to form pupil/learner's conviction of an appropriate choice of a profession (2.36) (see Table 3.).

Teachers working in comprehensive schools found it hard to decide how significant for implementation of career education are the skills to elaborate diagnostic and educational programs (2.01), assess the efficiency of career education activities (1.97), and determine the specific requirements of professions (1.96). The respondents had an idea that the administration of diagnostic activities and the designing of career guidance programs are complicated and labour-consuming process. Respondents found it hard to assess their theoretical knowledge and practical skills.

The results show that teachers/career education professionals do not consider important the skills to create non-conflicting program (suggestions) to reorient vocational students for another, more appropriate profession (1.11) and skills to design career education program for diverse age groups (1.48).

Table 3. Average and weighed average of statements' importance

Average in the groups of respondents	Statements											
	1	2	3	4	5	6	7	8	9	10	11	12
The group of comprehensive school teachers	2.67	2.92	2.47	2.75	1.80	1.78	1.96	2.01	1.48	2.36	1.11	1.97
The group of vocational school teachers	2.74	2.87	2.66	2.58	1.99	2.02	2.01	1.97	1.51	2.38	2.43	2.04
Weighted average for both groups of respondents	2.68	2.91	2.49	2.73	1.82	1.81	1.97	2.01	1.48	2.36	1.26	1.98

The replies of teachers from *vocational education* were analyzed separately. Respondents' answers show that these teachers need more theoretical knowledge on determining the professional compatibility (2.87), relationships between the individual peculiarities of learners and requirements of diverse professions (2.74), they lack knowledge on the formation of professional motivation of learners (2.66). They also recognize the insufficient skills to determine the particular professional interests of learners (2.58) and to develop their conviction for having made an adequate choice of profession (2.38) (see Table 3.)

The comparison of the data coming from comprehensive education and vocational education demonstrates that the major needs in both places are: extending knowledge about determining the professional compatibility (weighted average – 2.91), skills to determine pupil/learner's professional interests (2.75); extending knowledge about the relationships between the individual peculiarities and requirements of diverse professions (2.68); and acquiring more comprehensive information on the professional motivation of learners (2.49).

In relation to the division of statements in the groups of theoretical knowledge and practical activities, it was discovered that there are no statistically significant differences between the importance of these two groups of statements ($p < 0.05$).

The data in the *theoretical content aspect* reveals the respondents' positive attitude towards extending knowledge on determining professional compatibility, pupil/learner's particular professional interests, information on the relationships between individual peculiarities and requirements of diverse professions, as well as pupils/learners' professional motivation.

The results in the *practical content aspect* suggest that majority of respondents are not oriented to the acquisition and improvement of practical skills in the sphere of career education. The most important skills mentioned by teachers/career guidance professionals are the ability to determine the compatibility of pupil/learner's motives with the profession requirements on the part of community and skills to assess the efficiency of career education activities. This may be explained with the sufficiency of the practical experience of the respondents, yet unsatisfactory theoretical knowledge in educational psychology.

Table 4. Importance of statements for two groups of statements and two groups of respondents

	Theoretical knowledge statements					Practical activities statements						
	1	2	3	5	11	4	6	7	8	9	10	12
Average importance of statements for comprehensive school teachers	2.67	2.92	2.47	1.80	1.11	2.75	1.78	1.96	2.01	1.48	2.36	1.97
	2.19					2.04						
Average importance of statements for vocational school teachers	2.74	2.87	2.66	1.99	2.43	2.58	2.02	2.01	1.97	1.51	2.38	2.04
	2.54					2.07						
Average importance of statements for both groups of teachers	2.37					2.06						

The analysis of statements' importance regarding the theoretical knowledge and practical activities indicates that for both groups of respondents theoretical knowledge is more important than practical skills. The significance of theoretical knowledge for teachers can be explained by teachers' strongly perceived lack of theoretical knowledge in the field of career development that would not allow them to develop their professional skills.

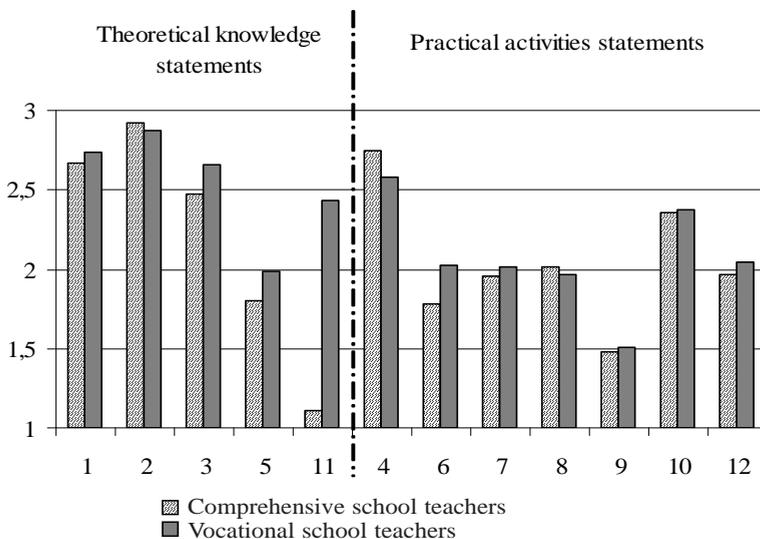


Figure 1. Importance of two statement groups for two groups of respondents

Teachers/career guidance professionals need to improve their practical skills to determine pupils/learners' particular professional interests and develop pupils/learners' conviction for having made an adequate choice of profession.

The analysis of data has brought out certain paradoxes, e.g. though the respondents did not consider it possible to carry out diagnostic activities independently and design career guidance programs for each age group, they were ready to work with pupils/learners using such programs if only they would be able to extend their theoretical competence and improve their skills.

The analysis of data leads to the conclusions that for efficient career guidance and career education implementation, teachers/career guidance professionals need (1) to extend their theoretical knowledge in the following spheres: career guidance and education peculiarities in diverse age groups, developing professional interests and motivation, determining the professional compatibility; (2) to improve their skills of enhancing their pupils/learners' conviction for having made an adequate choice of the profession; (3) to extend their theoretical competence and improve their skills, teaching materials, in order to be able to carry out diagnostic activities in career education and design career guidance programs for different age groups.

The analysis of comments showed that only 5% of respondents offered some suggestions. Respondents who replied to this open question basically acknowledged that they need information on profession market monitoring in Latvia and abroad. They expressed a wish to gain prognostic information on this issue for the next 10 years. It was discovered that respondents have a desire to establish a position of career consultant in their schools: *Pupils need to learn how to choose the occupation corresponding to their abilities as early as possible. We hope that in future similarly as to other countries the adequately educated and paid career consultants will be also employed in our schools.* Though the comments were not very extensive, in general they show that teachers are aware of the complexity of career education.

Second stage of activities: Guidelines and suggestions for teacher further education programs

Focusing on the study of teachers' needs, the group of academic staff of the Daugavpils University put forward suggestions for developing the content of professional career guidance program. They reflected both on specific psychological aspects of career education and on integration of the concept of sustainability. It was emphasized that the content of teachers' further education programs has to be connected with the peculiarities of certain age group, for instance:

- learners in grades 7 – 9 pay a great attention to discovery of their abilities and individual features as well as development of social contacts in micro-, mezo-, and macro-environment. Their interests are emotionally coloured and unstable;
- learners in grades 10 – 12 develop essentially different motivation of behaviour and focus more on social motivation. There is a growing interest about how to assess and develop one's individual abilities and gain more profound knowledge in the subjects corresponding to their future profession. Self-assessment and self-education are especially significant factors facilitating the personality development.

Elaborating further education program for teachers/career guidance professionals, it would be necessary to emphasize its orientation toward sustainability based not only on meeting the individual needs of learners, but perceiving these needs from the broader economic, cultural, social, and spiritual contexts.

The aim of the United Nations Decade of Education for Sustainable Development is to promote and improve the integration of education for sustainable development into the educational strategies and action plans at all levels and sectors of education in all countries. Education for sustainable development is a visionary approach to education that seeks to help people better understand the world in which they live, and face the future with hope and confidence, knowing that they can play a role in addressing the complex and interdependent problems that threaten our future such as poverty, wasteful consumption, environmental degradation, population growth, conflict and the violation of human rights (UNESCO, 2006). However it must be acknowledged that integrating the principle of sustainable education into the educational curricula in Latvia is at an early stage. Integrating principles of sustainability in career education enables orienting this education toward a more global aim that is not narrowly grounded on egoistic interests. Career education has to make contribution for the whole society helping every individual to understand his/her position in future.

Elaboration of teacher further education program

In the framework of CEPPSE Project, a work group under the guidance of DU researcher E. Oļehnoviča worked out the teacher further education program *Career Education Organization in General Education and Vocational Education Institutions* (2005). This program aimed to update the professional qualification of the career education support staff by acquiring relevant competences. These competences included organizing career education activities in general and in vocational education, work with informative and teaching materials, skills to select adequate and up-to-date forms and methods of work corresponding to the needs of successful adolescent/youth socialization and professional self-realization, encouraging pupils/learners to make conscious decisions concerning their future education and profession choices.

Content of program

The content of teacher further education program includes three parts:

- the basic course (32 hours) focused on organization of career education activities in general education and vocational secondary education entailing the theoretical basis of career education; career education planning and organization; pupils/learners' career development stages and competences; basic positions of career advising;
- the specialized course (20 hours) oriented toward the organization of career education activities in grades 7 – 9 entailing the methods of self-cognition; portfolio creation; pupils' competences in investigating education and occupation; pupils' competences in career planning; career education program elaboration; work with the teaching materials for career education provision;
- the specialized course (20 hours) for organization of career education activities in secondary school and vocational education entailing the methods of self-cognition; portfolio creation; secondary school learners' competences in investigating education and occupation; secondary school learners' competences in career planning and decision making; career education program elaboration for secondary school and vocational education establishments; work with the teaching materials for career education provision in secondary school and vocational education establishments.

Third stage of activities: Implementation and evaluation of teacher further education program

For the implementation of the further education program, teaching materials *Multiplicator's Portfolio* were elaborated in cooperation with Riga Teacher Training and Education Management Academy, Daugavpils University, Liepaja Teacher Training Academy, Latvia Agriculture Academy, University of Latvia, Professional Career Choice State Agency, along with the experts from Dobeles State Gymnasia, Riga Culture Secondary School, Carnikava Primary School, Riga J. Poruks Secondary School, Talsi State Gymnasia, and Viesīte Vocational Secondary School.

The materials were approved in the further education courses for multiplicators in February – March 2006, at Daugavpils University. In the framework of CEPPSE project, 44 multiplicators from 38 regions of Latvia were involved in the further education program. Till the end of 2006 they delivered the program to more than 90 general education school teachers from 38 School Boards and 280 vocational school teachers, thus all in all the further education program was mastered by 3819 teachers from all regions of Latvia.

The results of teacher further education program

Implementation of further education program envisaged (1) the development of the theoretical understanding of career education and organization and planning of career education activities for grades 7 – 9, in secondary school and vocational schools; (2) the improvement of teachers/class teachers' competences for integrating career education topics in teaching school subjects and general education work, acquisition of methods and techniques of studying learners' professional intentions, improvement of skills to deal with information and teaching materials (Internet, profession descriptions, teacher's books and learners' work sheets, etc.); (3) the acquisition of methods and techniques for studying pupils/learners' professional intentions, improvement of competences of supporting and facilitating adolescents/youths in the process of selecting further education and potential career.

In order to clarify the achieved results and identify the possible problems in program implementation, 44 program participants (multiplicators) were interviewed by the end of the first stage of further education courses in February 2006, and by the end of the second stage in March 2006. The questionnaire entailed both quantitative and qualitative questions related to the content of program, assessment of lecturers' performance, and organizational issues. The significance of the program is illustrated by statements of teachers that express the views of the majority of respondents (full text available in the publication of Career Guidance Information Centre of Vocational Education Development Agency):

The benefits of the course are its high quality and practical teaching materials... new useful ideas for lessons, self-cognition, as well as web page addresses for acquiring information...

I have gained lots of good ideas for motivating learners for further development and choice of profession...

The course was focused on individuals and their needs. The acquired ideas are useful to improve the self-assessment of both learners and teachers. The elaborated materials are very useful for career planning, thus also for successful creation of the individual life base... (Mācās, lai mācītu, 2006).

Fourth stage of activities: Teaching materials and informational sources

To ensure the sustainability of career education, improve the professional competence of teachers, provide them with the resources necessary for career education, the following items were designed involving more than 40 experts from comprehensive schools, vocational schools, and higher educational establishments of Latvia:

- (1) teaching materials *Career Education for Grades 7–9*, *Career Education for Grades 10–12*, *Career Education for Vocational Schools* with teacher's handbook, CD, and work books for learners;
- (2) informative booklets *Education after Grade 9*, *Education after Grade 12*;
- (3) interactive web tests for youth: *Test of Interests*, *Test of Career Values*, *Test on Motivation*, *Test on Selecting Work Environment*, *Test on Relatedness of Academic Subjects with the Further Career Choice*, etc.;
- (4) DVD materials: *Find Your Way: Career and Education Opportunities in Forestry*, *Find Your Way: Career and Education Options in Electrical Engineering and Electronics*;
- (5) electronic data base of national education possibilities www.niid.lv;
- (6) booklet *Improvement of Life-long Career Development Support Services*, *Career Education Support – Handbook for Policy Makers (Projekta KIPNIS rezultātu publiskuma apliecinājums, 2007)*.

Teaching materials were approbated in the educational institutions of Latvia – both general education and vocational school teachers gave a positive evaluation to these materials and teaching aids as an essential support for career education activities. It was also emphasized that the teaching materials and other productions are available for general public at school libraries and on the Internet.

Conclusions

In order to provide sustainability of career education activities in Latvia, from 2007 to 2013 several important tasks have been designed for career education development related to including career education in the long-term education activity program, teachers' professional updating for career education, career consultant preparation according to the needs of the career development support system in the country as well as raising the capacity of responsible institutions, e.g. State Career Development Agency Career Support Department, improvement of the cooperation between social partners and public organizations, creation of information and career development support centres, etc. (*Izglītības attīstības pamatnostādnes...*, 2006).

These activities testify to the efforts taken for career education development, yet they do not envisage full involvement of higher educational establishments, neither is any research planned that would be coordinated on the national level. Thus, there is no answer to the question about the sustainability of the aforementioned activities and

teacher education activities in career education and the relation of these activities to the urgent needs of teachers.

Teacher further education program is meaningful if it is based on the urgent needs of the teachers and facilitates the development of professional competence. It is recommended to integrate the principle of sustainability in the content of each professional development program, involving the ability to evaluate basic positions of education policy, extend the understanding of career education goal and facilitate the development of the professional competence of teachers.

Accepting the idea of sustainability, the content of the study program must include not only the local but also the global context that emphasizes the close interaction and unity of all processes including the environment, social, and economic components as well. In the same way, for the assessment of study programs in the context of sustainable education, cooperation of institutions matters more than competition, in the case of which there is a tendency to ignore the idea that we all are interconnected in a holistic unity.

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