

Pragmatical and theoretical questions
of the educational in Zoo

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In a sense, education and teaching have always been present in zoos. Not necessarily consciously, but from many viewpoints, presentation itself indirectly or directly – resulted in a pedagogical effect. Zoo pedagogy, as a concept has occurred in the second part of the 20th century. All over the world, more and more zoos have begun to deal with education. This period of time concurred with a change which influenced the representational attitude of zoos, and the changing animal-keeping environment has met the requirements of environmental teaching aims. Within the Worldwide Association of Zoos, Zoo pedagogues' international association (IZE) has established which coordinates this work.

Since then, practically in every zoo some kind of educational work is done. At a minimal level, this is limited to the presentation and the creation of notice boards which can be found at animal – runs. However, in most of the places, more is done than this. In an average zoo, people's interest is highly used; they want to see more than just animals for the entry fee: some kind of “action” as well. This kind of “need” has established the practice of “feeding and looking”. In addition, during this, the sight itself can teach, but the practiced keepers, maybe zoo teachers, can convey much important information to the visitors. Above all, mainly in huge zoos of Western-Europe and the United States this kind of formation of attitude towards zoos is created by the involvement of biologists, museum-pedagogues, teachers, fine artists, and last but not least volunteers. (Berkovits and Naiman, 1997; Haase, 1997; Barnes 2002)

These institutions regularly take part in public education as well, in each stage from nursery to university. Zoo pedagogical working teams take part in teacher further education as well, beside traditional group leading, lectures, presentations, and summer camps: they work on lesson plans, curricula, and even on course books which follow the required studies of public education. For instance, in Bronx Zoo learning development happens as well, and what is more, curricula and course books, created by their Educational Section, are used in 40 states of the United States and even in China. (Berkovits and Naiman, 1997).

This practice should be – in my opinion – improved and created into an educational act which affects the whole personality. Since visiting zoos is a rather occasional family or school programme, a long-term visualization of personality development cannot be thought of. Therefore, more teachers should be involved in the zoo pedagogical practice, who with their students can achieve a regular educational process that can even last for years. This could be a long-range aim, whose attainment is not impossible, does not require too much expenditure in money; and as it can be seen below, could be truly efficient.

The research

Research hypotheses

Based on my experience, zoo pedagogy is an efficient way of working. It is successful in “traditional” teaching; therefore, during lessons in zoos, course curriculum can be more efficiently acquisitioned by students, than in schools. With my first survey, I would have liked to prove this statement empirically. Until this study, I have not done a survey focused on this particular single question yet. In addition, I have not found a similar one even in specialized literature of zoo pedagogy.

I find zoo pedagogy successful in other areas of education, firstly in connection with affective education. Thus, I highly emphasized this field during the second measurement of the research on students’ environmental attitudes. At the same time, it is an essential question in the education of environmental-health conscience attitude that whether it has any sense: are the school, the teacher able to reach a change in students’ affective attitudes, life-leading? In the specialized literature of environmental teaching, data can be found which suggest that a well-developed pedagogical programme can be efficient and can bring forward demonstrable results in a comparative research. Therefore, if this effect of zoo pedagogy can be successfully supported by a measurement, its productiveness can be immediately compared with other programmes. Thus, my first two hypotheses are the followings: zoo pedagogical work is an efficient tool in environmental – and health consciousness education, and it can be more efficient than other educational methods. Another important question concerning pedagogical effectiveness is that how durable the reached results are. To what extent remains the taught and learned knowledge; and is age correlation demonstrable in educational “results”? In this current study, the examined question was the change of environmental attitudes demonstrable with ages. In this topic the research hypothesis is that the result of zoo pedagogical work is durable, as well in the affective and behavioural components of environmental attitudes.

The research sample

The research sample was composed of current students and students with final examinations of Apáczai Secondary School. I made an effort to plan and execute the research in order to be

able to eliminate the possible misleading results of the not absolutely representative sampling. The measuring of the efficiency of education was done with students of classes, which resembled as much as possible. By doing this, the differences based on the comparison of students with distinct abilities and prior knowledge could be excluded. During the attitudinal research, I created comparative analysis only with a small number of “outside” students; I rather focused on the differences and similarities within the whole group. In conclusion, it rather meant an advantage that the examined persons – taking their abilities into consideration – almost formed a homogeneous sample.

Data processing

Altogether 404 persons took part in the empirical research. The more than thousand data – where it was needed – were quantified, then I statistically analyzed. This is an amount of data, which is already hard to evaluate due to its numerosity and in itself, not truly informative. Processing required group formation, where only that amount of data needed to be dealt with, which could be already used in practice.

The measurement of efficiency of education involved 217 secondary school students. Since the distribution of participants based on gender and/or place of living was not under the scope of my current research, therefore, while creating the statistics, they were not taken into consideration. During the attitudinal research – 187 participants – I endeavoured to form a group, in which students regularly took part in classes held in zoos during their secondary school studies; and within this group, they represent different age groups, as well. To reach this aim, I have contacted former and current students of mine: personally, on telephone, in letter, and via e-mail. Since I have done pedagogical work in ten complete school years, the ages of participants fluctuate from 16 to 28. Above gender differentiation I created three age groups. Thus, I gained a sample in which statistically appraisable representation of each group was possible. Defining the significance, the level of 5% was formed to be the basis for both researches.

1. Measuring the efficiency of education

Research progression

On each year (class) I chose one topic, which I taught for one class in a zoo, while for the other class in school, within the surroundings of usual conditions. While teaching, I maximally endeavoured to take attention to the viewpoints of comparability. Therefore, I always kept the class in zoo first, where I voice recorded everything, and measured the passing of time. I planned classes in school on the basis of this, and held it practically with the same words and under the same time limit. Hence, every difference occurred due to the distinct places of teaching.

Before and after the classes, I made the students write a short test, which measured the level of prior knowledge, and provided a base for the comparison. The preliminary task sheet was written directly before the class, while the second – in the usual way – was written in the following class.

The tool of research

The task sheets before and after the classes contained similar close-ended test questions, which were distinct only in number. Naturally, the same task sheets were given for all year. With the help of these, I examined the way how the measurable level of knowledge changed in a certain topic due to the effect of classes held in different places. The task sheets were composed of already tested, previous test exercises. I was highly aware of the fact preferably not to ask anything as a prior knowledge, which is absolutely new information at a certain class. Anyway, I took this viewpoint into consideration while planning, so I chose those topics that contained new concepts, although connected to preliminarily learnt knowledge, as well.

Analysis of research results

The represented statistical data unequivocally prove that the organization of traditional classes in a zoo is an efficient pedagogical tool. In the case of students, who have similar bases of knowledge, a significant difference can be observed in the change of the extent of

objectively measurable knowledge, too. Based on the four years, the result of comparative research shows that on three years, classes held in the zoo unequivocally created significant difference. Only in the results of the eleventh grade there could not be found a statistically significant difference. However, during data analysis it can be seen that the class, which in the beginning scored lower mean results, reached a better result in this too, than the control group did.

While understanding data, it is worth mentioning that not only the mean results progressed to a larger extent, but also standard deviation declined greatly due to classes held in the zoo. Therefore, classes unitarily generated better results; the reason for a higher mean is not because of the highly better tests of some “better students”.

Therefore, the composed research hypothesis could be unequivocally certified respectively to the efficiency of education.

2. Research of environmental attitudes

With this research, I would have liked to represent the improving effect of zoo pedagogy in the formation of secondary school students’ environmental attitudes.

The definition of attitudes in the relevant specific literature is not absolutely consistent, because it is a fairly “overall” concept. To compose it simply, the environmental attitude indicates that attitude in which a person correlates with his environment. (Havas – Varga, 1999) In the practical pedagogy – even without a concrete definition – the most important fact is that attitudes influence behaviour, so the change of attitudes results in the change of behaviour. In addition, the base of alterability can be approached from an empirical perspective, since this is not an instinctive, innate phenomenon. The outcomes of formed attitudes, however, also influence learning, and in each and every case are evaluative attitudes.

Neither shows the analysis of the structure of attitudes a consistent standpoint, but it can be highlighted again that every author emphasizes the emotional bases of attitudes. When dividing attitudes into three components, besides emotions, knowledge and action are present. In the model, the cognitive component of attitudes refers to a person’s knowledge in connection with the given attitude object; the emotional component covers the positive or negative emotional trend; while the behavioural component is a kind of rough forecast in the

solution of the relevant action situations. It is supposed to exist a hierarchic, systematic organization of the three components.

The question, according to my current research, is essential because from accepting this theory of ternal structure, however with some modification, I endeavoured to measure separately the emotional and behavioural components. (The bases for this were provided by outcomes of other research, which unequivocally proved that between the components a strong correlation can be found.)

Research tool

I regularly created questionnaires and could test them while examining the effect of zoo pedagogical work in the formation of environmental attitudes. For this research, I used Likert-scale composed of 25 items, because I found it more applicable for the measurement of “general” environmental attitudes.

I endeavoured to create the whole scale in order to fit the theses to each other, and in composition do not deviate from the general language use of participants, taking part in the research sample. They should be comprehensible, relatively simple, and should approach the examined attitude object from more viewpoints. Another viewpoint was to let sentences, holding/transferring positive and negative value judgements, in order to give opportunity to extreme opinions.

Theses can be grouped on the basis of two viewpoint:

1. They can be divided into five groups, according to certain questions related to subtopics in connection with attitude. These are healthy manner of living, drinking water, healthy nutrition, and finally general environmental attitudes. Naturally, no question concerning healthy nutrition was present within the questions concerning healthy manner of living. (However, on this basis, these theses could have put into two groups, as well.)
2. They can be divided into two groups, according to whether it examines the affective or behavioural component of attitude. Nearly – as far as odd numbers allow – in equal distribution, I formed 13 emotional and 12 behavioural theses.

Evaluation of measuring instrument

I checked the used scale according to many viewpoints. Reliability was done by bisecting method and by the definition of Cronbach alfa co-efficient – which is the most acceptable measurement method in the expression of innate consistency –, validity, more precisely, validity in connection with criterion was done by the definition of Pearson correlation co-efficient.

- Correlation between subscales and questions, referring to the examined variables showed that the used scale is a consistent measuring instrument. The bisecting method related to the whole scale ($r=0,764$) showed strong correlation.
- Cronbach alfa co-efficient (0,828) surpasses the usually required level of psychological scales.
- The received outcomes, after correlating the scores of subscales and the whole scale, show strong correlation which is an indicator of adequate validity.

Evaluation of research

Since I have done statistical analysis based on many viewpoints, therefore, the results will also appear according to these.

1. In the subscales, the average scores and the percentage values, correlated with maximal attitudinal scores and the whole environmental attitude scale were examined and unequivocally came out that I received significantly more positive results everywhere, than in the case of neutral attitudes. The highest scores were found in the scale of healthy nutrition, while the lowest scores were found in the scale of drinking water. It can be seen from the comparison of emotional and behavioural components that the scores are higher in the emotional subscale. However, if they are compared separately to the neutral level, than the difference is not significant either. Therefore, it can not be concluded that in the case of the examined persons the behavioural component is more positive, than the emotional.
2. I have also analysed the received data according to the distribution of genders.
 - The outcomes show at each subscale that women's environmental attitudes are usually more positive than men's, since the only case where they did not receive higher scores was in connection with drinking water. However, this

difference is not significant. The greatest difference can be observed in the health and healthy nutrition subscales.

- It is an impressive distinction that the higher scores are due to the difference of emotional attitudes, since in the scores of behavioural component, no distinction can be found! Therefore, it can be concluded that women's attitudes towards health – and usually towards environment – are more expressed, more explicit than men's. This outcome is not surprising if the two genders' emotional lives are taken into consideration, but it is important that the distinction does not occur – in the case of the sample – when behaviours were under the scope.

3. The average scores and the percentage values, correlated with maximal attitudinal scores were examined in the sample's distribution of age groups in the subscales on the whole environmental attitude scale:

- Based on data, no outstanding differences of tendencies could be observed in each subscale while comparing age groups. However, looking at the whole environmental attitude scale, it can be said that no negative correlation can be observed in the relationship of age and environmental attitudes.
- If I compared secondary school students with elders, I did not receive significant differences and tendencies on each subscale either.
- The calculation of the linear correlation co-efficients did not result in different outcomes, it only showed that in the case of the examined sample, environmental attitudes placably correlate positively with age ($r=0,098$). Therefore, it means that practically, the examined variables do not correlate with age.

Summary

- On the basis of received results it can be said that the examined persons' environmental attitude scores highly surpass the neutral level in the case of every topic. Regular zoo pedagogical education greatly moves environmental attitude to a positive direction. The reached outcome can be seen as durable since even after 5-10 years of the final examination, no negative altering can be experienced. (True enough that neither positive can be, however, I have not even supposed that.)
- I find it a major outcome from the realization of the aims of environmental education point of view that attitudes' behavioural component is huge, referring to the whole

sample, it received even more scores than the emotional component. This means that during educational work – as far as it can be said in connection with a measurement of this type – the aim of environmental and healthy conscience could be successfully reached.

- I compared the results of this study with the results of a study done by the National Public Educational Institute (OKI) (Havas – Varga, 1999). They conducted a study in connection with the improving effects of pedagogical programme, named “with Natural sciences Across Europe” (TEK). The questionnaire was filled in by my students in 1998, because I took part in the programme with two classes, what is more, I served as a Hungarian coordinator. (Ács, 1999) For the sake of comparability, certain points of that questionnaire were used here without any change.

On the basis of results, it can be concluded that zoo education can endure the test of comparison. In the environmental attitude research it caused higher scores in everywhere, than the TEK programme. The divergence was less between the emotional and behavioural components of attitudes – zoo pedagogy can be considered efficient in the field of behaviour, as well –, and I could not experience negative age correlation. This was one of the statements of OKI: “with Natural sciences Across Europe indicates the [negative] effect of age only in the case of environmental knowledge”. (Havas – Varga, 1999)

Analysing efficiency

The research hypotheses were proved by the received results, therefore it can be stated that zoo pedagogy is an efficient opportunity in the teaching of biology. In addition, it is also efficient in the environmental and health consciousness education, as well. Due to its effectiveness it provides a position in the theory and practice of education. No doubt that the topic of theory and practice of zoo pedagogy requires more research, however according to my own experience, the reached results are due to three main factors:

1. motivation, which is transferred by animals and plants, and in general, the distinct environment (differing from school environment)
2. methods, which often differ from methods applied at traditional classes
3. the “application” of the above mentioned: students should not be taught even in zoos to let themselves and their emotions led by the momentary, current atmosphere, which

is identical with the aims of teacher. As opposed to this, personality formation should be regularly created by preliminarily planned, wide methodological repertoire.

I am a leading teacher of a training school. In this medium it is a priori rare to approach a class-room education from a different perspective (from traditional), since the main aim is to help students reach a successful final examination and the admission for the chosen institution of higher education. Training schools – and mostly other secondary schools – can not deal with the formation of the whole personality in the class-room, during classes. In better cases, teachers use opportunities, which are present in connection with the realization of subject aims, but in my opinion, it should be the other way round, or at least should be in balance, thus it should deal with the most complete sense, with education itself, and within this it should realize subject requirements. Zoo pedagogy is – a maybe more specific – solution for this problem, since it offers opportunities which can not be found at any other field of education in this measure. If I remain tightly with natural science education, then the exit from the practice of traditional classes means only forest schools and trips.

The former is achieved by only a lesser percentage of schools, since it is not easy to organize, and it means serious, regularly not properly financed work for teachers. However, the truly enthusiastic colleagues do this job and they can tell really good educational results. Unfortunately, even in their cases, it is not possible to bring students to forest schools more than once a year, therefore, continuous pedagogical work can not be achieved. (In the pedagogical aims of many schools it is enlisted to bring students to forest schools at least once, not annually, but during the whole school years.) Thus, the reached effect of personality development is questioned, more respectively, becomes more occasional, and less fixed.

Field trips also offer good educational opportunities, but similarly, they require much organization and financial needs from parents. Above all – disregarding rare exceptions – for students, a trip means rather a couple of days of relaxation with friends, and far from the parents. Thus, even if it is dealt with, among educational aims the maximum is the cultured behaviour and – unfortunately – the rules of consumption of alcohol occurs. The field-work feature of trips has simply lost, and most of the teachers – at least tacitly – accept.

Zoo pedagogical activities have great advantages over the above mentioned. It is easier to organize, execute, cheaper; therefore, it can be regular, and the aims of knowledge getting can be bulged. In this case, students can be more efficiently motivated than for example during boring museum visiting within the frame of class trips.

Zoo visitings can give such an emotional surplus to biology – or to other subjects – lessons, which can be a returning experiences, it creates a repercussion growing in the personality, which is education in the narrowest sense. Tolstoy wrote that “germs of every human opportunity can be found in everybody”. These germs – according to personal interests – should be developed, and zoo pedagogy could be absolutely usable for this. It provides a so wide spectrum of opportunities with which it can approach everybody from a different perspective, and the openings, it offers a wider spectrum of the directions of personality development.

Many human etiologists have already written that in the species of the human race – despite the changing of the latter millenaries – there lives the Hunter. They analyze that the different aspects of our lives: daily work, most of our hobbies, sport – how can be traced back to our whilom ancestors hunting style of living. As I see it, experience gaining in zoos is also a kind of hunting, an emotional one. From the youngest to the eldest – contact searching with animals can be observed. People usually find laying, relaxing animals boring, we wait for them to look at us, we look for contact. Not consciously, but we long for that kind of possession which is offered by our acceptance, registration of our existence. We can feel when the connection has established: “he looks at me, I’m registered”, in a sense, “he is mine”. The creation of contact is the first step in the raising of the thirst for knowledge, or the other way round, the thirst for knowledge can serve the aim of contact searching. The result is on every account the human – animal relation system’s change.

It is not accidental that visitors are always deeply touched by the keeping environments of zoos. They used to approach this problem in a fairly anthropomorphic way, since in the case of the already known animal as a “personal belonging” those questions, which in the case of animal keeping or even in children raising emerge, immediately rise as well. The aspiration to “give him/them the best of everything!” occurs. This is an area of personality development, evocation of human “kindness” – concretely towards animals, but via this, on every account towards people as well. Nonetheless, the good relationship with animals helps people in their own surviving, it directs them towards emotional surviving instead of the neurotic line of the modern man. (Animal therapies are world widely held for similar reasons in order to hail mental diseases.)

Firstly, this affective tuning sets the bases, zoo pedagogical work enters at this stage into personality development. Not only does it teach about animals, but it also helps, even in an indirect way, to learn from animals, from the zoo, itself. And even if this whole has a result such as this: when a student becomes an adult and makes trip with his own children, maybe

visits zoo with them, and remembers his childhood experience, emotions connected to this – I am absolutely sure – will have a reflection on their relation with animals, plants, other people, and generally, to the whole environment. It seems a modest result, but it is an aim as well. However, we should not stop at this stage, since loads of other opportunities can be found in zoo pedagogy.

Our students with final examinations do not show those characteristics – which would more precisely foreshadow in the 21st century the successful citizen of a society and as a person as well. If we accept that for the long-run mankind has a future only if – we are going to be able to take attention to our natural and social environment from an acting perspective. This kind of interpretation of the exercise of education occurs in the modern educational, social- and environmental psychological theories. István Bábosik writes in his book, named Theory of education that the aim of education is to prepare a person for a constructive life-leading approach and “we understand a kind of life-leading approach when talking about constructive life-leading which is valuable for the society and effective for the person, as well.” (pg. 18) Constructive life-leading finally appears in the person’s constructive behavioural- and activity repertoire, since the life-leading of the person is his behaviour, namely it can be judged by his behaviour and actions.

The ability of acting is present in the life-leading of citizens of the sustainable future, moreover critical thinking as well. The aim would be that the partners of the next generation would be creators according to opportunities, and participants of decisions and actions, instead of being mere sufferers and executors of commands and guidelines coming from upwards. For this, up-to-date and continuous refreshed knowledge system is needed, the ability to use information, and for other abilities for which schools of today and teachers do not prepare.

Nowadays, international and national pedagogical developments are directed to a lesser extent to the contextual parts of the desired mastering of education. The use of the concept “competent” has become generally accepted. Among the key competencies, defined in the European Framework or Reference, the environmental competence is not present, but by knowing the general policies it can be easily defined what it can be meant under this term. Environmental competencies mean the “ability of acting” in environmental protection, with consideration to the viewpoints of sustainability – thus, result in **environmental consciousness** action.

Therefore, the first aim in pedagogy – theoretically, and not practically – the development of competencies, – in our case – education of environmental conscious citizens,

and the tool for this is the environmental education expanded with the viewpoints of sustainability.

In connection with educational aims it is strongly needed to mention that in the specific literature of environmental education, hardly can be found anything about the healthy manner of living of the person. However, the importance of one's own healthiness is more important for most of the people than environment's. The viewpoints of course connect to each other: let's live a healthy life in a healthy environment! Thus, I mean under the terms of environmental education and the pedagogy of sustainability the thing that is predestined to educate the person into an environmental and health consciousness man, in a way that it develops the required personal competence elements.

In my thesis, to a certain extent, a dominance of didactics can be observed. The main reason for this is that I would have liked to represent what I mean under the concept of zoo pedagogy. I endeavoured to circuit what kind of work a teacher can do with students in the zoo. I highlighted those advantages and opportunities, which I experienced during the competence – centred and not subject-centred pedagogical work. At the same time, I also have to highlight it again that zoo pedagogy can surpass school subjects, it aims at developing the whole personality, and this is the most important surplus by which didactics becomes immediately “only” a tool in the educational aims.

Development of special abilities in zoo pedagogy

The further analysis of zoo pedagogical research may give an answer – at least partly through the instance of environmental education – to what are those special abilities, competencies, whose development would be indispensable in the execution of the above mentioned educational aim.

1. Ability to learn individually

The ability to learn individually is a kind of competency that students in a sense have to acquire. Therefore, it is not a process of day to day work, and it involves the teacher too, just as the needed motivation and the properly chosen subject. Nowadays, the difference is more evident between the knowledge-centred school concept and societal – economical thirst for knowledge, which focuses on abilities and skills. At the same time, in environmental

education the measure of learning is thought to be the action. Naturally, in the background of environmental consciousness action there is the environmental knowledge. They have to be acquired somehow. However, it not the same how it happens and for what reason!

Authentic teaching – therefore, the good teacher – motivates students to form, elaborate own memory structures. This can be achieved mostly in active context. During zoo pedagogical work the minimum is to make the audience in an indirect way to look for phenomena presented by a living animal. We talk with them, even the group is formed by students or adults. During this talking, and respectively the posed questions we can gain knowledge about their prior knowledge, the stereotypic thinking living in them, in order to help them create new theoretical knowledge based on former, already present ones. Beginning from missing, maybe naïve knowledge, as far as it is possible, they create their own knowledge structures, in other words, they learn. In this process the (zoo) pedagogue is not only a broadcaster of information – as usually at schools -, but also establishes emotional bases, and directs, helps the learning process.

When a zoo pedagogue talks to people at animal run, he will not change their knowledge by telling them dry pieces of information. However, if he tells them interesting facts in an interesting manner than he can “touch” his audience, in other words, he can influence them emotionally, then he can become successful. He will not expand their concrete objective knowledge, but he changes their emotional attitude, when people go home with the following thought in their heads: “This was interesting, that was worth listening to.” Naturally, a part of this emotions directs towards the lecturer and towards the situation (zoo visiting), but another part will certainly result in change of attitudes concerning the visited animals, nature – it comes to the same thing how we call it, because we talk about a general, complex phenomenon. There is a chance that in the case of any person, without considering age, will look for a book at home, looks it up on the internet, thus will learn individually.

The other important problem of the question of teaching and learning is motivation. Without motivation nobody will learn, such as no practice will be done. (Dweck, 1989) If we want to reach more than just enrich students’ knowledge about animals, and we want to teach things that is not directly and absolutely rewarding to learn, than we have to deal with motivation, as well. During pedagogical work the appointed aims are reached in different educational situations, mostly by solving exercises. For the sake of a stronger motivation, it is useful if students are allowed to follow the formation of aims. It is even better, if we let them speak into the planning of exercises. The feature of school work does not give opportunities to organize teaching – learning in this way. However, zoo pedagogy is ideal, since it can be

better pre-planned, interesting and lots of situations can be created where students can learn alone in order to reach the aim. The elaboration of well-chosen problems is rewarding, as well. (“Rewarding” already begins with that we do different things in different places of course. They can get rid of most of the boundaries represented by school, and they can be part of an interesting process at an exciting place. There is loads of challenge in this situation.)

“Let’s learn how to learn”- this is a commonly heard statement. This is not a rather well-formed sentence, since we can learn since our birth. We can create mental structures without any effort, we automatically answer to our failure of expectations by generating comments. The “Let’s learn how to learn” suggests as if this concrete knowledge was valueless. (More precisely, it shows again what we concentrate on as knowledge!) The real exercise is to lead students along to the point, where the gaining of knowledge causes them pleasure, and therefore they would like to learn more and more. Children (and adults as well) should believe in being able to learn. This usually causes a problem for students who track back the experience of school failures to the fact that they are not enough clever. (Eckert, 1989) They do not have to learn how to learn but to believe in themselves and in their abilities. In zoo pedagogical work taking more care of these students, realizing differentiation they can be led to the fact that the road of gaining knowledge is not closed before anyone. It is also lucky that any kind of competition is not present, there is no concrete testing, no failure. This situation has already caused “wonders, miracles” with some students – in other words, regular zoo pedagogical activity –, and their accomplishment in school have also bettered. They created in themselves an individual learning strategy which can be used in other – even in school – situation as well.

Therefore, the ability to learn individually begins where somebody can experience regularly the pleasure of learning, and can see alone the road to the aim. In this case, the important principle of the pedagogy of sustainability, namely “life – long – learning” automatically comes true. It seems that the time of accomplished learning is over. School is not able to transfer knowledge to students with which they can manage a good living. Transferred knowledge is at advance with giant strides, and new knowledge is present, establishing the necessity of “life – long – learning”. Therefore, the pedagogical aim is to help students to be able to gain knowledge alone – and do it with pleasure! – then to be able to combine new knowledge with already existing knowledge structures and to be able to use them. We must realize the self-monitoring of the whole learning process. In other words, the student is going to be able to estimate which knowledge and skills are useful to him, how he can acquire them, which methods and learning sources (pedagogues, books, data source)

should be used. If someone knows how to learn, how one can find the knowledge one needs to learn, and how to give up not useful thought, then in theory, one can find himself experienced in any other area. (Stasz, 1990)

2. Complexity

The combination of new knowledge with already existing knowledge structures means the ability of information processing. This is what we teach, or rather: have to be practiced by students. With the widespread of computers and the Internet, we can more easily find answers to the questions, therefore, in the future the more easily it can be gained, the less the value of information will be. Now we can easily access information. Therefore, the future is the information processing. We can state that the knowledge of facts itself worths less at the knowledge market. We have to teach students to process and analyze “gained” information and “experienced” experience. We have to evaluate their observations, general and creative thoughts. We have to think less about that concept which says that there are correct answers, and we should get to know that everyone looks at the world differently.

During zoo pedagogical work, even during “simple” guidance, the complex analysis of seen events is in an important viewpoint. Students and adults are partners as well, if we show them how to conduct it. While observing animals we validate complexity, and while talking about experiences more viewpoints occur. The practice of multiple viewpoint analysis facilitates the development of systemic concept thinking, mends the efficiency of information processing. The formation of complex knowledge system also prevents the evoked problems, since recalling of knowledge from a well-structured memory system is easier.

The difference between “beginner” and “intermediate” groups can be easily observed. Those, who have already participated in zoo pedagogical activities, propose more viewpoints, they are capable of more complex analysis. In the beginning, this occurs at the group level, but later on this is going to be a personal feature, as well.

3. Problem solving ability, ability of open – situation handling

Today, the current picture of a student is the “receptive” one, instead of the “self-monitoring” active student picture. The national survey shows that instead of interactive

pedagogical situations, pedagogue-centred activities rule the practice of education. (Havas – Varga, 2003)

The principle in zoo education is to support natural experience gaining. We let students to face different situations, during the reaching of certain – important for them – aims. They can be owners of developing, more complicatedly organized knowledge structures, memorisation can occur on the basis of this by experience processing, can create their own comments, if their expectations are false. In memory there is an unequivocally relation between expectations, false expectations, and the comments given to them. Above all, all three factors take a key part in memorizing, prompt. (Read and Cesa, 1991) What is essential is that we have to make it possible for student to practice situations – they way, they feel pleasure by doing it – which they can face in real life. Or they contain at least those elements, about we – for example teachers – think that contain everything, we want them to teach.

During problem solving, handling of situations they acquire new knowledge, but their general problem solving ability is improving as well. By this learning they acquire how to reach something at a certain field, and they form strategies which are independent from those fields, and cases which as exceptionally wait for to be combined with the system of memories.

It needs time for the practice of handling situations and cases. Therefore, it is inevitably important that the problem, which is wished to be around gone in practice, contains more knowledge elements as well, so to correspond with the compulsorily written subject points and educational aims. I do not know how it could be realized in the case of other subjects, but I have already seen that in the zoo there is a great number of opportunities at the fields of natural sciences and social sciences, as well.

4. Ability to decide

In our daily life we often have to make decisions. The key concept of the pedagogy of sustainability is to make one of the results of education as students being able to make decisions in their adult lives which reflect the elements of environmental conscience behaviour. However, for this it is not enough to teach fact, it is at least so important – even more important – how they feel about the question emotionally.

By environmental education we want to reach that people behave in a responsible manner, and to make them able to answer questions concerning environment. This might

important in school environments. From this it can be concluded that it is vain to tell them what to do, they may know it in theory – in other words, in consciously memorisable rules, in the forms of rational facts – but they just will not do it. This is why environmental education has to education in the narrowest sense, and be able to influence unconscious knowledge and affect emotions deeply. Since this can be achieved by zoo pedagogical activities, it is expected from decisions, actions reflect the educational aim. This was proved by the conducted attitude research as well, since it showed that zoo pedagogy can influence emotions in a way that it can influence the element of environmental consciousness behaviour. International practice has unequivocally proves that in the development of environmental consciousness of inhabitants (consumers), the multiplication roles can be filled by participants taking part in organized environmental education. (Valkó, 2003) Through this, zoo pedagogy may also have a highlighted role – at an individual and societal level – in the influence of decisions about consuming, manner of living, politics.

5. Ability of criticism

An important element in the development of the ability of learning and of personality is the usage of feedbacks. Generally, our students are passive participants of the process, and they do not receive enough feedback about their learning progresses neither in quantity, nor in quality, only about its outcomes. They do not know why they are successful or have failures, and this is why they can not elaborate on their learning strategies. Above learning improvement, feedbacks have high influence on emotional education.

If we apply open-ended situations during pedagogical working as well, the jobs of teacher are going to change in the fields of the execution and evaluation of the process. The evaluation with grades – such as in school – faces here a serious problem. If a situation does not have an unequivocal answer, then no objective grades can be given for the solution attempt. If the problem is not connected only to one subject, than we are going to face other problems as well. Above all, grades can not evaluate the learning or problem solving process. When evaluating the work that was done, we have to apply positive critic and commendation, and we teach the use of these to our students through our own examples.

In point of fact, critic is a feedback, a form of information broadcasting. It means a help in connection with expectations, with execution of tasks. More precisely, it should mean help if we applied well. The badly-used, told critical comments can have very strong negative

effect. In a sense creating criticism is one of the most important tasks of pedagogues- and usually of all kind of leader. Students' efficiency, satisfaction, school atmosphere are mostly influenced by the feedbacks they get, and how we tell them problems. The manner of criticism mostly defines what the quality of student-teacher relationship will be, therefore every teacher candidate should learn this way of evaluation, as well.

Rough, attacking critic does not contain any mending suggestion, in most of the cases it does not even contain the problem. One could not find a worse method for strengthening motivation and self-confidence. Good critic focuses on what was successful or what could be successful, and it offers solutions for missing parts. Thus, students do not lose hope, do not give up, we motivate them to put effort into other things in the future, as well.

The other side of the story is that acceptance of a critic should be taught as well. Evaluations in a group are also useful for practising this, since we have to accept students' properly formed comments, and we have to react to them. We have to keep in mind that criticism is a kind of emotional relationship for both sides, which should be used in order to widen the efficiency of social relationships and problem solving.

6. Co-operation, social relationships

Another critical element of learning development is the establishment of an adequate atmosphere, where learning takes place. On the one hand, it is an important attitude that no one should feel learning against group will. During visiting zoos, this is not used to be a problem, every member of the group is motivated enough not to happen this kind of differences. On the other hand, it is essential that students spend most of their time in school, not in the zoo. Consistent attitude has to be kept here as well, and there is a need for establishing a group will, class community which manifests in helping too. A warm, provident atmosphere greatly helps learning.

Activities in the zoo, with my students always take place in societal and age integrated environment. Children learn social skills through contemporary relationships: it can be observed how others solve the situation then there is opportunity to attempt to do it. Activities usually require group work which greatly contributes to the skills, listed in the name of the chapter. Co-operation in order to reach some aim is absolutely improves the emotion field. According to psychological research (Williams and Steinberg, 1988), a kind of group intelligence exists which decides at which level they can solve the exercise. The most

important factor of this is the extent how members of the group can tune to each other. This is the functionality of emotional abilities. The group members individually can be students with good skills, however it is not sure that they can work well together.

The most essential conclusion is that co-operative working should be taught and practiced. Those attributes have to be formed which altogether make the group successful. For this, verbal comment is not enough again, it is not worth telling, what makes a good team. In schools, most of the teachers do not apply group work, or even if they take place, the rare application does not make it possible to improve it. It is not enough for groups to tell the results of their work, they have to face how they received this result and how they could have worked more efficiently. The best time is when we deal with groups during solving the problem from this perspective. In class this can be hardly realized or can not be realized at all, since groups sit tightly next to each other, there is no opportunity to talk about something apart from the others. Above all, if a teacher works with a certain group for a longer period of time, and the others can see this, they may feel that they are in the background, or the other way round, they are better than the other group. Neither opportunity is good for creating a communal spirit.

In groups students have to find out alone what kind of behaviour facilitates the more efficient work. The more behavioural pattern they meet, the more effectively can this observation encouraged. We used to analyse with the group how one behaved and to what extent does it contributed to the success of the group. It does not require a long time, but exceedingly efficient. From this it can be concluded that neither overzealous, aggressively leading persons nor “parasites” contribute to the success. Students can form a kind of behaviour, which is between the two above mentioned manners. They learn what is allowed and what they can do within a community. Due to the formulated harmony, the exercise solving causes more pleasure than when there is disagreement within a group, and emotional intensions rule. The regularly re-organised groups make it possible to practice roles, and being able to adapt to new situations.

This kind of “therapy” during formation of the class community – of course not after one or two occasions – brings spectacular development. It is observable that students take care of their relationships with each other, the number of students at the margin declines. There often appear individuals who – regarding to their educational work, which is a rather important aspect in the school life – are in the background, but due to their emotional abilities become central figures. This is when people find out how easily people create judgement about someone on the basis of one aspect, and these prejudices are difficult to change. When

“bad and good” students form a group and they learn how to work for the same aim as equal partners, then prior stereotypes fade unperceived. Or not even unperceived, because they often tell how positively they are disappointed in others.

The regular, educational work out of school is absolutely important is personality development. Admission for a secondary school means the end of childhood, and alone itself means an enormous test. Students, getting into a new community used to experience the decline of self-confidence, growing of shyness apart from other problems; they even evaluate themselves absolutely in an antinomical and fluctuant way. The so-called “social self-confidence” damages especially – in other words those belief that they are able to make and keep friends. At this point, it is a great help for students if their ability of being able to make close friends, coping with problems of friendships, and self-confidence are strengthened.

7. Communication, emphatic ability

The key element of emergence in life is how we can influence others. Since man is a social being, therefore, the communicational ability is a central question in his life. Within the competencies defined by the European Framework of Reference, communication on the mother tongue and foreign language occurs. Interactive methods used during zoo pedagogical activity gives more opportunity for students to manifest – mostly verbally – therefore; this area can be proved efficiently. If we do the activity in a foreign language, or the other way round: if we teach foreign language class in the zoo, then naturally we have contributed to the development of this competence.

As I see it, that part of communication is missing from the definition of the European Framework of Reference which is non-verbal, since the medium of emotions is mostly non-verbal communication. To understand other people’s emotions not the words but the tone, the mimics, gesture offer communicational channel. It is inevitable in social interactions to be able to receive it precisely and use it consciously. We can read in others’ emotions the most efficiently, if we are receptive to our emotions. (Larsen et al., 1987) Therefore, empathy is built on self-consciousness, self-knowledge, even if it is biologically given. (Brothers, 1993) In the childhood the most important element of the developing of empathy is family harmony, mainly, respectively mother-child. Later, building on the bases brought from family life, in social interactions – in contemporary groups, as well such as in teacher-student relationship – our empathic ability develops. Development is the field of emotional education and among its

methods we can find mainly those pedagogical tools which were applied out of school. (Other tools are rather used by specialists; belong to areas of activities of therapies.) Since zoo visiting have always have free, unbounded parts, if other times not before and after during travelling, since many opportunities appear in order to establish a community, and to polish our personal emotional lives. Let's learn the other better, let's realize what one buys in the buffet, does he even buy something at all – opportunity of a not definitely conscious estimation of the situation of the other, opportunity to improve our own emphatic ability. During activities all sorts of communicational forms – from lectures to class debate – have an influence on students' and teachers' range of expressions and on emotional competencies, as well.