

CHILDREN'S MULTICULTURAL SOCIALIZATION THROUGH SCIENCE AND TECHNOLOGY

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In 2006 we have visited a settlement with three nationalities, with the intention of socializing the pupils belonging to the three ethnic groups, through a technical workshop. This workshop was held by Trevor Davies, science and technology teacher from the University of Reading, UK. At the school in Tărlungeni, a village near Brasov, learn pupil belonging to three ethnic groups. Our goal was to put pupils, belonging to different nationalities, into the situation of getting to know each other under pleasant working circumstances and as such to prevent prejudices and stereotypes. Since then the school from Tărlungeni received several equipments and financial support that allowed starting the construction of a multifunctional building for afternoon activities. In the same building there will be a laundry and a bathroom. This paper presents the workshop that took place on the 19th of May 2007 and the research that followed it. The workshop was attained by the formative assessment method.

Keywords: multicultural, socialization, Gypsy, formative assessment, transfer quotient, workshop, science and technology, creativity

The formative assessment

The formative assessment was combined with other concepts of the cognitive psychology, such as the formative diagnosis, the nearest formative zone – introduced by Vigotsky, the learner's intelligence potency, dynamical testing and connected to this the transfer ratio.

It is known from the research, that the formative assessment, if applied connectedly, is the most effective strategy in the improvement of learners' capacity and learning skills.

The most frequently used assessment form in schools is still the collective assessment, that neither helps all the learners nor does it solve the learning problems.

The formative assessment, on the other hand, is the permanent form of learners' success and the interactive understanding of the thinking process. Through this, teachers can successfully find individual solutions, to eliminate learners' mistakes, complement the deficiencies; in one word, it is the best strategy that best suits the individuals' learning necessities.

The difference between the two assessing forms is, that the formative assessment focuses the learners' and the teachers' attention, through the

acquired information, on the development and not on the outline of learning accomplishments. In the same time, it can serve as a basis for the phrasing of constructive development requirement either in the everyday activity or in the curriculum.

The formative assessment is an education, respectively a process that controls learning, that comes true through informal methods, interactive assessments as well as classroom activities. It adjusts the strategies to the learners' developing possibilities and their learning necessities. The developing assessment serves to establish the learners' development and learning necessities and adjusts it to the teaching. According to this, one important advantage is that it helps and forms the learning process. Another advantage is its flexible interaction with the teaching and learning strategies. (Allal & Lopez, 2005). Formally, the class activity is attained according to what is said in the literature (Csapó, 1997). Preceding this, we evaluated our learners' previous knowledge and skills through a diagnostic test. These were followed by an initial end of chapter survey, to eliminate frequent mistakes and individual deficiencies (personal talks, computer based teaching programs etc.) followed by a final survey. I evaluated these scores according this *transfer quotient*:

$$T_r = \frac{X_{\text{poszt}} - X_{\text{pre}}}{X_{\text{max}} - X_{\text{pre}}}$$

The quotient transfer characterizes the learners' accomplishments, specific for the knowledge gain, in a relative and not in an absolute form. A teacher differentiates effectively only if the learners' quotient transfer is around 0,33. Therefore, the task that best suits some learners is the one that gives this quotient transfer. In a given situation the learner's nearest developing zone is the knowledge that is between these two intervals. If the transfer quotient differs in a significant way, or it takes a negative value it either means that the task was too difficult for the learner, or that the learning motivation was not efficient enough. In this case the problem was with the thoughtfulness or the attitude of the learners'.

The plan of the socialization workshop from Tărlungeni

We decided with Trevor Davies, science and technology teacher from the University of Reading, to socialize learners, living in the same village but who do not know each other and speak different languages, with a playful workshop in the form of a contest.

We have chosen the school from Tărlungeni, a place where pupils of different nationalities live, with a special consideration on the Gypsy children. Our purpose was to extend the chances of Gypsy children living here.

Melinda Székely Hencz, headmaster of one of the school, presented the situation of the gypsies from Tărlungeni. According to this the gypsies are very unpretentious and live under modest circumstances. More generations live together in a little room. Education does not play an important role in their lives. It is difficult for them to get a job, but many of them got used to live from financial supports.

Just a few of them manage to get out of their community, and 80 % of them never can, and never will return. Two of them are already instructors. They learn the Gypsy language only because their leaders named them

gypsies in order to win programs that were meant for gypsies, because otherwise they do not have a specific language. Their children get on the list of special educational needs because of social deprivation.

The aim of the research and initial hypothesis

We wanted to analyze the way in which secondary school learners' creativity, logical thinking and discovering skills change during one day of interference. But we also observed the way in which pupils, who speak different languages and come from different cultures, accept each other.

The research was done together with the science and technology department of the English Reading University and pupils of Tărlungeni's Secondary School. Our hypothesis:

- a) Pupils belonging to different nationalities can easily socialize even through a whole day workshop if the task is interesting, there is a pleasant atmosphere and the success is assured.
- b) In the case of weaker learners this type of interference is more successful, if compared to the traditional educational method. However in their case a single intensive interference can lead to regression.

Running of the research

1. There were 20, 12 – 15 years old participants, being of Romanian, Hungarian and Gypsy nationality, disadvantaged pupil from Tărlungeni and Zizin.
2. Used materials:
 - tests (initial and final testing)
 - interference: workshop (cooperative group work)
3. The process:
 - initial creative exercises (numbering sequence, putting a fractional line onto a 3x3 chart that has 9 points)
 - interference (a whole day program consisting of: creative tasks, exercise planning, realization of the planned tasks in heterogeneous groups, and all this in a playful and competitive way)
 - Final creative exercises (numbering sequence, animal recognition on the basis of given body parts, drawing shapes with a sequence line, match shift)

Learners worked in groups of two to three during the activities. Each group was of a heterogeneous composition: Romanian, Hungarian and Gypsy learners, without knowing each other before. Each group stood with a teacher, whose role was to ensure the formative assessment, meaning that learners could always ask for help and discuss the tasks.

Problems to be solved

Students can work in groups of 2-3. The tasks were chosen from the list below:

- *Construct an electric engine*
- *Package ten marbles neatly and efficiently so that they could be sent safely to another country in the post.*
- *Construct a machine to transport a fresh chicken's egg the greatest possible distance using only the energy which can be stored in a small rubber band.*
- *A Time delay*
- *Construct a portable bridge able to bear the heaviest load before collapse*
- *A Water clock*
- *Attractive egg packaging to withstand a one meter drop*

The results

We can observe, that the learners' level of comprehension correlates with the scholastic record. After the activity, in the final testing, there were in six cases worse and in ten cases better results than in the previous test. It can be noticed no relationship between the bad results, the scholastic record or previous knowledge.

About the alteration of creativity we could say that in the case of weaker learners creativity sank by the end of the activity. Most probably by the end of the day their concentration capacity diminished. But of course we can not draw a relevant inference from the case of 20 learners. The weaker results of the final tests can be associated with the fact that the activities were slightly different from the ones in the initial test, and it contained not two but three activities.

The observation of the socialization in the course of the activities

The research had one more phase, namely to see how learners succeeded to make friends and socialize with each other. The groups got some packets with sweets (candies, cookies or chocolates) at the end of the activity. The sweets were not of the same value, they were different but each packet contained only one sweet. After giving them the packets, we asked them to eat the sweets. After a short time we noticed that they shared the sweets so that everybody got from each type of sweet.

Learners' and teachers' feedback about the activity

After the research teachers and learners had to answer to six questions. In the case of each nationality six learners and two teachers gave an answer. The questions were compiled by Melinda Székely Hencz headmaster. These answers can be seen below:

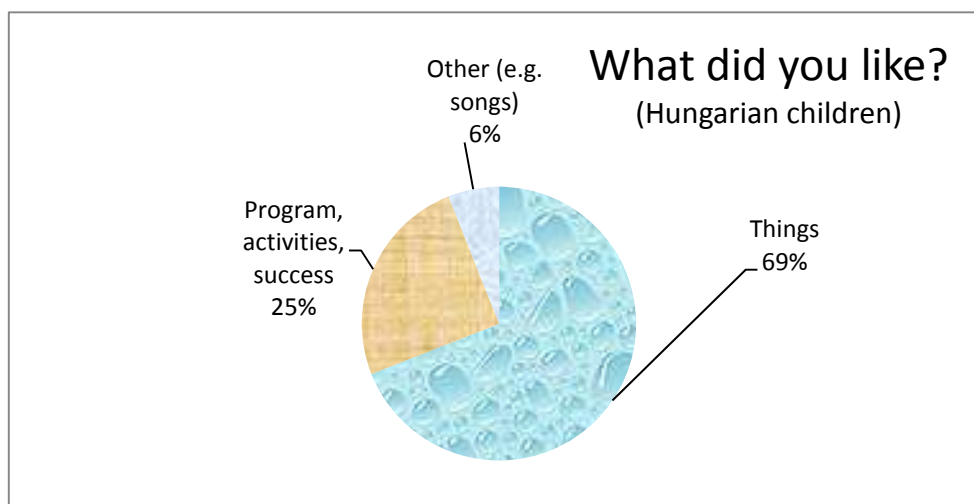
1. List three things, events that you specially liked.
2. List three things, events that you did not like.
3. What should have been done or organized in a different way?
4. With what kind of feeling did you leave after this event? (list three significant emotions, feelings)

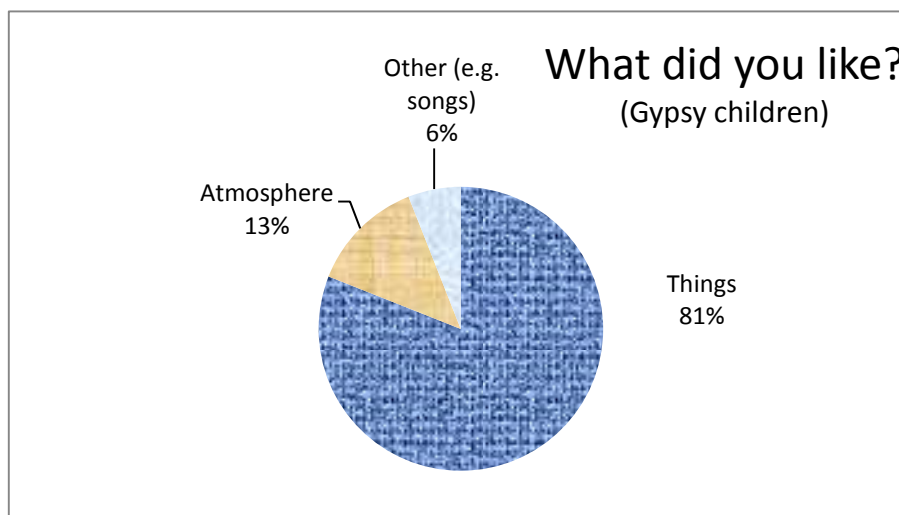
5. Has this Saturday activity changed anything in you, regarding your attitude towards the school, your classmates and teachers? What?
6. Put some questions to the organizers regarding this activity.

1. Table. *List three things, events that you specially liked*

Romanian children	Hungarian children	Gypsy children
<ul style="list-style-type: none"> - the building of the car (5) - the packing of the egg, (4) - the happy mentality we all had, the friendly atmosphere, the team spirit everybody showed (3) - the things we had done, the tools (2) - the electric engine (2) - the song we played on the guitar - to divide a paper into four 	<ul style="list-style-type: none"> - the building of the car that takes the egg (4) - the packing of the egg (4) - the program, the activities, that everyone had great tasks and everything turned out o.k. (3) - electric engine (magnetic invention, making rings from wire) 2- the teams, the friendship 2 - the supper, the English songs (2) 	<ul style="list-style-type: none"> - the car (5) - the egg (5) - the electric engine (3) - an extraordinary atmosphere between teachers and pupil, the team spirit overcame the problems existing in other situations - singing

The answers of the Gypsy children were poorer (disadvantageous situation) and their attention was focused especially on objects. For the Hungarian children more important were the atmosphere and the relationships. Other things like the lunch and the songs played an important role for everybody.





Hungarian children were more critical. The electric motor needed more manual skills, and as such should not have been done right at the beginning. The activity with the match-sticks came out to be difficult as well, because they hadn't done similar activities before. By the Gypsy children time represented a serious problem (collective culture).

2. Table. *List three things, events that you did not like*

Romanian children	Hungarian children	Gypsy children
- I could have done more, in order to finish the activities in time	- problems that occurred to the magnetic play (i.e. engine), the magnetic invention did not work at first, when the magnetic invention did not want to work - when the car did not want to work, the car was not as we wished it to be - the play with the toothpicks - only the teacher helped me, not my colleague - when we had to go home	- time always pressed us - not all the activities were hold

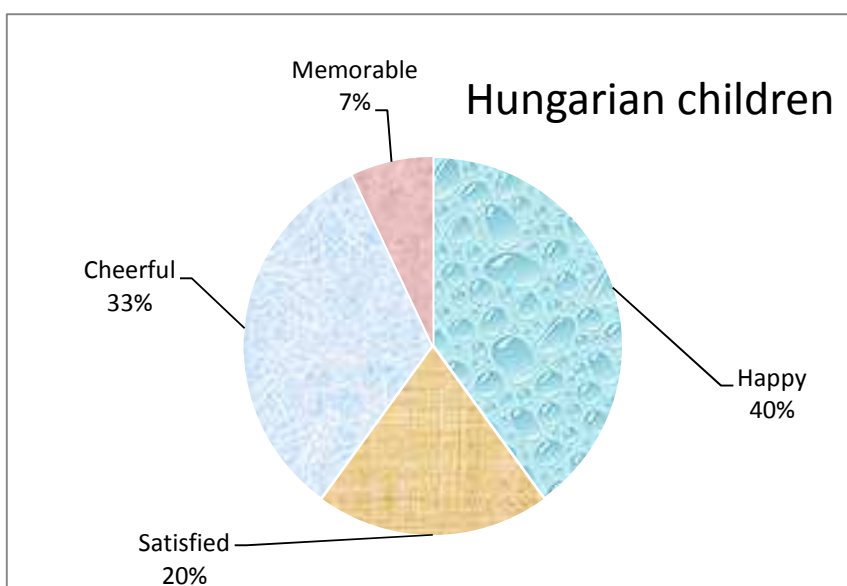
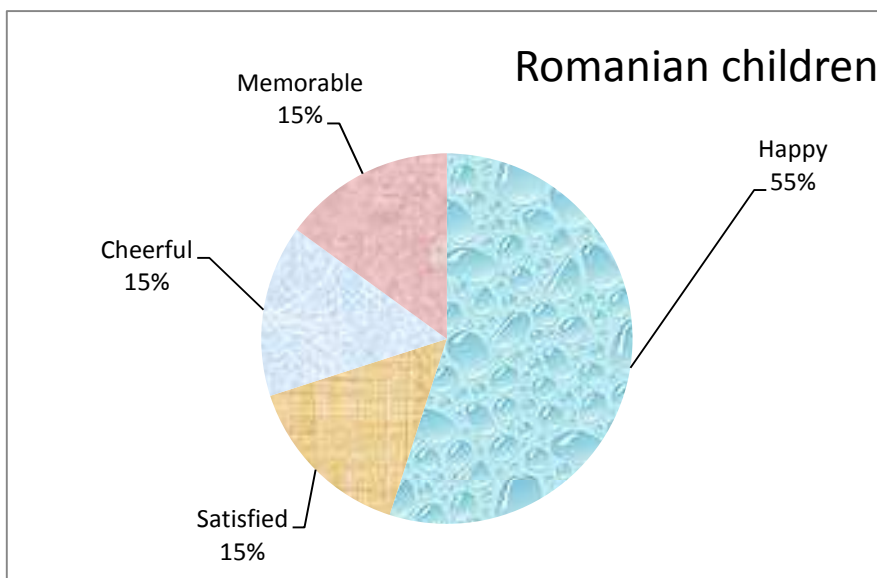
3. Table. *What should have been done or organized in a different way?*

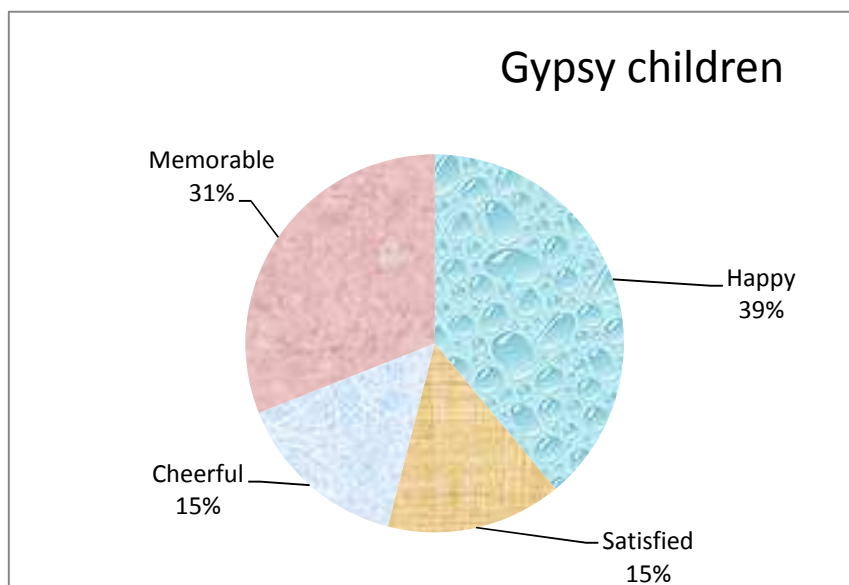
Romanian children	Hungarian children	Gypsy children
- nothing (3) - everything was well organized except the time that was not enough (2) - the choice of children should have been other	- everything was all right - there should have been more interesting tasks - the teams - there should have been a competition with the cars we had built - we should have been allowed to take home the things we made - the teams should have been chosen in a different way - we should not be mixed with foreign children anymore	- everything was O.K., everything was perfect (4) - more pupil should have been implied

In general, children do not start a group activity with foreign mates with partners, especially if their friends are in the other groups. The Gypsy children felt that it would have been good for their colleagues to take part in this activity as well (social need, collective culture). They did not have any negative feeling about working with foreign children.

4. Table. *With what kind of feeling did you leave after this event? (list three significant emotions, feelings)*

Romanian children	Hungarian children	Gypsy children
<ul style="list-style-type: none"> - very happy (6) - I had a great time, I was delighted, satisfied (3) - pleased that I could take part in this activity (2) - surprised, excited (2) 	<ul style="list-style-type: none"> - very happy because I had a great time, I have learned many things, I made new friendships (8) - satisfied because all turned out well (3) - I had a great time (2) - cheerful (3) - with memories 	<ul style="list-style-type: none"> - happy (4) - cheerful, moving, excited (3) - satisfied (2) - delighted - surprised - with new ideas - a little upset that all ended





It is worth observing that those children who live in minority do not really realize the feeling of happiness. The children from all the three nationalities were satisfied with the activities, but the Hungarian children considered the day more joyful. In the case of the *Gypsy* children, compared with the others, they considered the day very exciting.

5. Table. *Has this Saturday activity changed anything in you, regarding your attitude towards the school, your classmates and teachers? What?*

Romanian children	Hungarian children	Gypsy children
<ul style="list-style-type: none"> - yes it changed towards everybody, my relationship to my colleagues became stronger, there was team spirit, I learned that we have to work in a group, we have to take in consideration the ideas of others' as well, we all became more united as a consequence of the activities (6) - teachers were proud of us - no change (2) 	<ul style="list-style-type: none"> - I came out well with everyone, I get out better with my colleagues, I had the chance to get to know my colleagues better, I got closer my colleagues and to my teachers, we made new friendships (5) - it was better than in school, since I like handwork and here I got the opportunity to do what I like - I learned a lot and it was great to work with them 	<ul style="list-style-type: none"> - nothing has changed (3) - teachers were kinder to us than in school, I listened to my teachers (2) - I was kind with my colleagues - yes, when you want something you have to initiate

The frequency of answers at the question: "Has anything changed in you through the day?"

Among the Romanian and Gypsy children there were some who did not observe any change regarding their relationship to the colleagues or teachers. But most of them realized that the aim of this research was exactly the idea of getting to know each other better. Many of them got into the swing of the importance of cooperative group work and of the initiation. Gypsy children were of the opinion that teachers were friendlier to them as in school. It is interesting to observe that only the Hungarian children felt that something had changed in them through the day while the Gypsy children felt this least.

Romanian	Hungarian	Gypsy
Yes 7	Yes 8	Yes 4
No 2	No 0	No 3

6. *Question: Put some questions to the organizers regarding this activity.*
Also in this case Hungarian children turned out to be more critical.

Romanian children	Hungarian children	Gypsy children
<ul style="list-style-type: none"> - Will you come again? Will we meet again? Will it be again? Will it be a similar activity again? (5) - How did you feel yourselves with us? Were you satisfied with us? Do you think we were enough united? Did you expect something else from us? (4) 	<ul style="list-style-type: none"> - Will it be a similar activity again? Will we meet again? Why weren't more activities? (5) - What will you do with the cars? (2) - Why did we have to build cars? Why did we have to build cars if we did not compete with them? (2) - Why did we have to be in the same group with children we did not know? - Why did the groups nr. 2 and 6 win, since they were helped a lot? 	<ul style="list-style-type: none"> - Will you come again? Will it be again? (3) - Why did you organize this activity? - From your point of view, what were the disadvantages of this activity? - Can such an activity be hold under other circumstances? - Will there be a competition? - No question

Teachers' answers to the same questions	
1.	<ul style="list-style-type: none"> - the team work of the children - the functioning of the car - the satisfaction that could be seen on children's chin - timing - the equipment - instructions
2.	<ul style="list-style-type: none"> - we did not know the criteria according to which the jury decided - Why did the members of the groups 2 and 6 get t- shirts? - 2 groups made more objects than asked, but they were not rewarded - we did not know the criteria according to which the jury decided - I do not speak English and as a consequence I couldn't communicate
3.	<ul style="list-style-type: none"> - there should have been more children, but I do not think this was the fault of the organizers - I can apprise the organization with +++ - the winners should have been chosen according to well set criteria - the jury should have presented the criteria - they should have given the groups all the materials they could have used - not every group got 4 elements
4	<ul style="list-style-type: none"> - happiness - satisfaction - a little disappointment (after the prizes were given) - I was proud of our pupil's performance - I was happy that they managed to work in group - I was pleased with the results - I had a great time
5.	<ul style="list-style-type: none"> - this kind of activity gave me the chance to observe the practical side of my pupil - team work and team spirit make pupil accommodate to certain situations - I trust my pupil more than before - I realized that they are creative if they have a task - I will try to organize similar activities in our school
6.	<ul style="list-style-type: none"> - How often could similar activities be organized? - How much does it cost an activity like this? - Could you sponsor us?

Conclusions

- All in all everybody had a great time and would like to take part in similar activities again.
- The favorite activities were the building of the car and the packing of the egg. Most of the children did not have anything to comment, but some did not find okay the way in which the prizes were given. Some found it great to work in mixed groups, but for some others' the fact that they did not know their colleagues or that they were not helped by the others represented a serious problem.
- Most of the pupil agreed that this kind of activities make them come closer to each other and to their teachers.
- Teachers found it interesting the way in which pupil showed their creative sides and ideas.
- The Hungarian children were more critical about the activities, Gypsy children on the other hand were more modest and as a consequence of their culture they had a different view about the concept of time.

All in all we could say that the activity had reached its' aim. Children who took part in this activity will surely be more tolerant with others. Our initial hypothesis turned out to be true and during the activities the typical differences, mentioned above, could also be seen.

We are aware of the fact that the results presented in this paper are only guiding data that can serve as a starting point for further research. This one day activity was not enough to make an overall survey.

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