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**THE EXAMINATION OF THE PRACTICE, EVALUATION AND
EFFECTS OF OUT-OF-SCHOOL LEARNING AMONG PRIMARY
SCHOOL PUPILS, TEACHERS AND SCHOOL LEADERS**

Summary of the PhD dissertation

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TOPIC AND STRUCTURE OF THE THESIS

The topic of the thesis is out-of-school learning and education outside the classroom, which are lesser known and researched areas in Hungary. In several other countries though (e.g. Scandinavian countries, The United Kingdom, New Zealand, Canada, etc.) we can experience that greater professional attention is directed towards out-of-school learning not only from theoretical or research consideration, but it is also spreading widely in pedagogical practice (Barfod, Ejbye-Ernst; Bentsen, 2012; Rickinson et al, 2004, Rea & Waite, 2009). The reason of the increasing interest is that the non-formal educational locations outside the school may complement nowadays' formal education, which has numerous difficulties and problems. The goal of the doctoral thesis is to describe the characteristics, effects, advantages and barriers of out-of-school learning, outlined by revealing professional literature, as well as to present the findings of the topic's empirical research.

In the theoretical chapters, due to the Hungarian professional literature hiatus, first we outline the terminological and education theoretical basis of out-of-school learning, relying mainly on international studies and research reviews. We are also going to focus on the relationship between constructivist and pupils' activity-based teaching and learning methods (e.g. problem-based learning and discovery learning), on differentiating between formal, non-formal and informal learning features, and on the particularities of out-of-school locations compared to learning inside the school. Regarding out-of-school learning's some target locations (especially zoo, museum) we do have some Hungarian-related, mainly theoretical special literature, but general, comprehensive professional works have not been written yet, thus we have no obvious and approved Hungarian terminology and definitions. Therefore we follow the Scandinavian approach in terminology: by out-of-school programme, based on the Danish *udeskole* (Barfod, Ejbye-Ernst, Mygind, & Bentsen, 2016; Bentsen, 2012; Bentsen, Jensen, Mygind & Randrup, 2010; Bentsen, Mygind & Randrup, 2009), we mean all lessons and visits outside the school which are organised within the school's framework and take place during the school term, outside the school, on natural or man-made locations. These – although generally showing a multidisciplinary nature – can directly be connected to any subjects and may mean a one-time, one-class visit or a several-day-programme and several visits.

After presenting the theoretical and terminological framework, the dissertation is going to set forth the regulations of the National Curriculum regarding out-of-school learning, which serves as reference for schools how to organise education outside the classroom. However, its practical implementation may be hindered by numerous factors, such as circumstances impeding organisation, distrust in unknown or lesser known form of studying and questioning its pedagogical effectiveness. Therefore, in the theoretical chapters of the dissertation we are going to examine the critical influencing factors and barriers of out-of-school learning, offering possible solutions as well.

Gradually proceeding from the theoretical background towards the practice we will synthesise the international and national results of the effect examination of out-of-school learning as a result of many years' exploration of professional literature. Finally, we reach the other substantial part of the thesis, namely the presentation of own empirical research: its first, introductory chapters outline the purpose, theoretical model and structure of the complex research; then the online exploratory research and the paper-based longitudinal study's research

questions and hypotheses will be discussed. The methods and results of the two research will be presented individually.

Through our complex research with large sample, based on the professional literature's theoretical background, we found some supplementary results, on whose basis the current situation of the national primary school learning and teaching outside the classroom's practice can be outlined. Besides this the research's pedagogical importance lies in the fact that we have been the first in Hungary to work out and successfully apply a complex measuring process and its reliable and valid measurement tools, with whose help the characteristics and evaluation of the implementation of out-of-school learning, plus its effects on cognitive and non-cognitive learning can all be detected in primary schools' context.

THEORETICAL FRAMEWORK OF THE THESIS' RESEARCH

In the past couple of decades, the speeding world, the flood of information, technical achievements and constant changes of knowledge and attainments have presented a greater challenge to the 21st century and the future's citizens than ever before (Csapó, 2004). We are forced to react to these changes, to train ourselves in order to be able to cope: the process of learning cannot be closed when leaving school. "It is impossible to maintain the idea of dividing life into two phases, the earlier being the phase of learning and not working, the later being the one when work is the typical occupation and we do not study anymore." (Maróti, 2015. p. 24). The leaders of knowledge-based societies see the key in lifelong- and lifewide learning. Thus, there has been a paradigm change in the European Union's education policy which has also changed the attitude towards knowledge and learning. The Commission of the European Communities's document "*Memorandum on lifelong-learning*" emphasises tailoring learning to the individual's needs, individualising teaching and so accepting the diversity of the learning environment (CEC, 2000).

Public educational institutes also cannot ignore these changes and must transform from knowledge-like thesauruses into institutes which help learning and found the bases of individual lifelong-learning. Exclusively within the schools' framework, however, it would be impossible to provide students with all the attainments and knowledge, as well as with forming and developing all the skills with which then they will be able to cope all throughout their lives; plus, it is also dubious whether the lifelong-learning pattern can be adequately founded solely within the walls of classrooms. The locations outside the school may be solutions to the problem, as through their varied and particular nature they can facilitate the adaptation of such attainments and skills that are indispensable for lifelong-learning (e.g. seeking and filtering information, responsible decision making, problem solving), thus complementing and supporting classroom education.

Besides today's economic and social changes, the problems appearing in school education also impede the effectiveness of public education. The greatest problem is the steady decline of the learning motivation and the attitude towards school subjects: the students' attitude decreases, proportionately with the time spent in school, towards not "only" the automatically less popular subjects (physics, mathematics, chemistry, grammar), but unfortunately this negative tendency also applies to popular subjects, such as arts, literature, history or biology (Bølling, Otte, Elsborg, Nielsen & Bentsen, 2018; Csapó, 2000). The gap between scientific

development and school knowledge is too wide, the students' scientific performance is deteriorating. Students have difficulties connecting scientific achievements to everyday life, let alone applying them, and do not see the relations between each area of science (B. Németh, 1998; Korom, 2002). Because of the new learning requirements, it is necessary for students to be able to make connections between science and their everyday lives (Eshach, 2007; Holmes, 2011). Scientific education must be based upon real experiences, because if the attainments to be learnt are practical and authentic, students can remember them much more easily (Eshach, 2007, Halászné Szakács, 2017). Several locations outside the classroom are great opportunities and can help the realisation of authentic, science-employed learning, similar to formal education: museums, exhibition places, science centres, showroom laboratories, zoos and botanical gardens are special locations where real science lives, available to laymen, too (Bartels, 2001), under experts' control; thus creating a bridge between the supposedly too complicated and abstract scientific achievements and the audience (Eshach, 2007). Outside the classroom, the non-formal learning locations' further pedagogical potential lies in their complex and often interactive nature, owing to which learning itself happens via more sensing organs simultaneously and affects the cognitive and non-cognitive components of learning. (Rickinson et al., 2004). Due to their multidisciplinary nature, their richness in information and their interesting environment they may raise the motivation to learn and subject-attitude effectively; consequently, may make cognitive acquisition of knowledge deeper and more durable (Pintér, 2004; Sinka, 2004; Szczepanski, Malmer, Nelson & Dahlgren, 2007).

The last two decades' national curriculums' directives also reflect this paradigm change: compulsory school education's goal today is not to provide finished knowledge; the emphasis is on creating the necessary motives and learning skills for lifelong- and lifewide-learning (243/2003. [XII. 17.] Government Decree, 2003). In this spirit our valid, 2012 National Curriculum (110/2012. [VI. 4.] Government Decree, 2012) is also open to the learning possibilities of institutes enhancing individual or social self-education but requires only little number of practical implementation of programmes outside the school for public education institutions. The possibility of grabbing the opportunities is further narrowed by the fact that in accordance with the public education act learning on a location outside the school can only be organised if it is free and does not exceed the students' daily maximum number of lessons. Furthermore, organising transport, safety factors, lack of motivation and distrust of teachers and leaders of institutes can also be obstacles to implementing activities and lessons outside the school (Amos & Reiss, 2012; Bárd, 2009; Bentsen, Jensen, Mygind, & Randrup, 2010; Dillon et al., 2006; Waite, 2009). The teachers' disapproval and worries may be related to the hindering factors mentioned above but may also originate partly from lack of information regarding specialities and effect mechanism of out-of-school learning. Hungarian professional literature has very few sources regarding the topic, but the international literature also shows a mixed picture: studies and research accounts of different standard, focus and results make gaining information more difficult. The reason for this is partly due to research method mistakes kívül (Scrutton & Beames, 2015; Rickinson et al., 2004) and partly the fact that out-of-school learning is a very complex process (Amos & Reiss, 2012; Esteves, Ferreira, Vasconcelos & Fernandes, 2013; Orion & Hofstein, 1994) whose cognitive and non-cognitive aspects are critically influenced by several factors, such as previous knowledge, experiences and social relationships of the student, features of the location, pedagogical preparation of the programme,

applied learning-teaching methods, etc. Based on Orion and Hofstein's (1994), and Eshach's (2007) out-of-school learning model, furthermore on Falk and Dierking's (2000) contextual learning model these fall into the following categories:

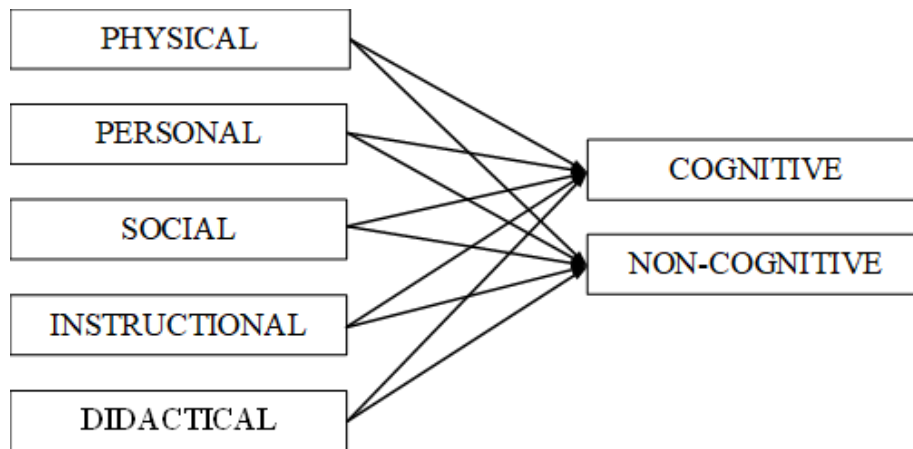


Fig. 1

The factors influencing out-of-school learning

In order to maximise the effectiveness of out-of-school learning, these factors must be taken into consideration when organising and conducting the activities. The same applies to the empirical researches in the topic, since the results may be influenced in a negative or positive way by the outer and inner factors of Figure 1, depending on the given programme's parameters.

RESEARCH AIMS

Although nowadays we see many positive examples of co-operation between museums, libraries, science centres and schools, for teachers to be appropriately able to exploit the possibilities and for learning to be really effective it is needed to have empirical research-supported studies and methodological offers based tightly on current educational theory foundations. Therefore, the main aim of our study has been the implementation of such a complex research that, based on the above-mentioned critical influencing factors, provides us trustworthy and valid results of the national practice, evaluation and effect of out-of-school learning. We have designed a multi-phase study to reach this goal, during which data- and method-triangulation have been applied (Sántha, 2017; Szokolszky, 2004); furthermore, with the help of the theoretical model appearing in Figure 1, the out-of-school learning process has been examined from constructivist (e.g. Anderson, Lucas & Ginns, 2003; Gilbert & Priest, 1997; Korom & Nagy L.-né, 2012) and socio-cultural (e.g. Falk & Dierking, 2000; Leinhardt, Knutson & Crowley, 2003) approaches with mixed (both quantitative and qualitative) methods (Abell & Lederman, 2008).

In the chapters presenting the empirical research we have been looking for the answer, outlining 30 hypotheses (see Table 3 and 4), to (1) what general situation is outlined by those national primary schools' learning-teaching practice in out-of-school learning which participated in the study; (2) what is the attitude and opinion of teachers, pupils and heads of schools towards out-of-school activities and visits generally (3) and towards programmes taking

place on specific locations; and (4) what traceable effects do lessons outside the school have on the pupils' cognitive and non-cognitive learning processes and performance?

RESEARCH METHODS

After the pilot examination the complex research was realised in two different sampled and data-recorded studies: (1) the study done by 3–8th grade pupils, teachers and heads of institutions through the out-of-school learning's online exploratory research (May-June, 2016) and (2) via the paper-based, longitudinal study of primary school pupils and their teachers (September, 2016 – February, 2017).

Sample and data collection

In research (1) 96 primary school pupils between third and eighth grade (N=4680), teachers (N=112) and heads of schools (N=69) took part from all counties except Heves. Regarding the two-sampled Kolmogorov-Smirnov test ($Z_{KS}=0,93$, $p=0,36$), our sample was representative of type of settlements, where schools of villages, large villages, towns, county seats and towns of municipal rights were represented. The following table shows the sampled students by their gender and grade.

Table 1. Sampled students by gender and grade

Gender	Grade					
	3.	4.	5.	6.	7.	8.
<i>Girls</i>	338	403	400	343	414	323
<i>Boys</i>	314	396	451	322	409	310
<i>All students</i>	704	838	894	718	865	661
<i>%(compared to the full student sample)</i>	15,0	17,9	19,1	15,3	18,5	14,1

The online questionnaires were filled in by the participants with the help of eDia (Electronic Diagnostic System; Csapó & Molnár, 2017; Molnár, Makay & Ancsin, 2018), whose unique and irretraceable measuring identification ensured the anonymity of the participants.

During research (2) we tracked 8 out-of-school, learning-targeted activities in Szeged (see Table 2). We tried to detect the cognitive and non-cognitive learning values, added by the programmes, during the pre-, post- and delayed post-test evaluation of data directly from the students and indirectly from other participants (escorting teachers and external observers). After data reduction, the sample of longitudinal study was made up of the pupils between second and seventh grade of three schools in Szeged and one nearby ($N_{full}=188$), their escorting teachers ($N_{full}=11$) and the external observers ($N_{full}=10$) of the activities.

Table 2. Parameters of the longitudinal study's activities

School	Ordinal	Location	Topic	Grade	N (person)	Escorting teacher (person)
A	1	Zoo	Inhabitants of the forest	2.	31	2
	2	Zoo	Water, banks of water	3.	27	2
B	3	Tudástár („Store room of Knowledge”)	Flora and fauna of the forest + laboratory	2.*	25	2
	4	Somogyi Library	Easter folk traditions		25	
	5	Botanical Garden	Halloween day	4.	27	1
C	6	Agóra	Health day	3.	23	1
	7	Agóra	Robotics activity	5-7.	10	1
D	8	Botanical Garden	Halloween day	3.	20	2

*Note: the same second-year class took part in both activities.

Instrument

All but one instruments are self-developed, whose creation was implemented by taking the results of special literature and our theoretical model designed on the basis of the exploration (see Figure 1) into account.

The online questionnaire was designed in two versions: one for the pupils and one for the teachers and heads of schools. Both versions consist of five blocks:

- (I) The administrative structure of the school/the pupils
- (II) Characteristics of the specific out-of-school programme
- (III) The effect of the specific out-of-school programme (4-point Likert-scale)
- (IV) General attitudes toward out-of-school programmes (4-point Likert-scale)
- (V) Conditions of organizing out-of-school programmes

The 23 items of Block III are an adopted Hungarian version of an originally 27-item-questionnaire containing an internationally published 4-point Likert-scale (Orion & Hofstein, 1991), which had previously been validated in the pilot measurement (Füz, 2014a, 2014b). The 10 questions in blocks II and III, relating to location groups, had to be separately answered by the participants depending on which locations they had visited in the six months prior to the data collection. These ten locations are the following: (1) zoo, wildlife park and tropical garden, (2) botanical garden and arboretum, (3) factory and works, (4) library and archives, (5) laboratory, (6) museum, gallery, (7) theatre, concert, (8) study-path, national park, (9) science centre, (10) other (location specified by the participant). The reliability-indices of the online questionnaire's sub-scales were good, all fell into the acceptable domain with the values of Cronbach- α between 0,64 and 0,91.

The paper-based longitudinal study's measurement tools were harmonised in accordance with the online exploratory measuring and its results were used as framework reference.

On the other hand, our goal was also to carry out deeper researches which are beyond self-avowal. The bases of our longitudinal study were three partial samples, but we did not involve heads of schools in the measurement, the pupils' results were complemented by data from the escorting teachers and external observers. Besides data triangulation we carried out in-between methods, qualitative-quantitative methodological triangulation which increases the validity of results (Sántha, 2017; Szokolszky, 2004). During pre-measurements, which took place one week prior to the out-of-school activity, data collection on the pupils' samples happened with the help of the following measurement tools:

- (I) 5-point Likert-scale measuring related subject-attitudes
- (II) Intrinsic motivation questionnaire toward environmental education (5-point Likert-scale)
- (III) Mind-maps with the given activity's keywords
- (IV) Achievement test on the activity's curriculum
- (V) Attitudes toward out-of-school learning programme (4-point Likert-scale)
- (VI) Students' report of out-of-school learning programme

Since the activities' location and subject is diverse, the tests' contents are not the same regarding the different locations, but their structure and the aspect of tasks are equal. Block V is an exception, where they were perfectly the same in all activities. The problem that only a classful of 20-30 pupils filled in the same tests derives from here – hence the changing and low number of samples do not make the scale's Cronbach- α index calculable either in the case of the scale measuring subject attitudes, or in that of the performance test (Bonett, 2002; Csapó, 2002; Yurdugül, 2008). The intrinsic motivation of the students toward the related school subject (environmental education) was measured by the intrinsic motivation sub-scale of adapted version of *Science Motivation Questionnaire II* (Korom, B. Németh, Kissné Gera & Nagy L.-né, 2016), which reliability-indices (Cronbach- α) were good between value 0,78 (pre-test) and 0,85 (post-tests). The *Attitudes toward out-of-school learning programme* questionnaire (V) is a version of the 4-point Likert scale, known from the online testing, expanded with four items related to the environment of the activity, which thus contains 27 items altogether. The questionnaire was also filled in by the escorting teachers in all three measuring points. The items of the teachers' scale were rephrased concerning their pupils. Due to the low number of samples the questionnaires' reliability could only be examined on the students' sample, whose Cronbach- α values were the following: 0,75 (N=179) during pre-testing; 0,71 (N=160) during post-testing and 0,79 (N=119) during delayed post-testing.

The post-testing's (within a week following the activity) and the delayed post-testing's (in three months following the activity) pupils' tests are the same as those of the pre-testing, only their phrasing is different, since not previous knowledge and expectations were measured anymore, but the effects of the realised programmes. Besides the sample collection methods presented above, we also required an account of experiences from the pupils (VI), in which we wanted to know: (1) We did this in... (location); (2) I learnt this in...(location); (3) I liked this in the activities; (4) I did not like this in the activities.

The activities were monitored by two observers who had previously attended a professional briefing and took unstructured written notes during them. Within 24 hours after the activity they were asked to fill in a structured observant diary and a six-phase scale of estimate, whose angles were created to give us information on all influencing factors, possibly on the

basis of our theoretical model (see Figure 1), as well as to make the collection of pupils' data richer and more colourful. Some items of the estimating scale can be suited to the items of the *Attitudes toward out-of-school learning programme* questionnaire (V), but the two scales do not exactly cover each other.

RESEARCH FINDINGS

The results of the online exploratory research

The classical test theory's statistical methods were applied to analyse the data, with the use of Excel and SPSS programmes. The reliability of the questionnaire was examined with the help of the Cronbach- α index. Besides descriptive statistics comparative studies (e.g. t-probes, variance-analysis, correlational and regression analysis) were carried out. The online measurement tool used for our exploratory research has proven sensitive enough to detect the differences between sub-samples (pupil, teacher and head of schools), grades and genders, plus the qualitative and quantitative differences between activities taking place on different locations. In the following we are going to summarise the greater results of the online exploratory research, presented in the thesis, then going to signal the verification or failure of the related 18 hypotheses in Table 3.

According to our research the organisation practice of out-of-school activities in primary schools follow the legal regulation mentioned in the introduction and the contents of the National Curriculum (2012), but the number and location of these programmes usually only reached the required minimum; thus, the participation in out-of-school programmes is occasional for students, which usually takes place during school trips in the frontal forms of lectures or guided tours. However, the subject attitude value of students towards out-of-school programmes was specifically high and based on students, teachers and heads of schools' statements the majority of them would really like to take part in similar programmes more often. All of these suggest that the reason for infrequent and occasional implementation is not to be found in the schools' attitude or negative experiences. Based on the heads of schools and teachers' answers the problem lies in providing financial funding and organising transport, but the crowded curriculum, sometimes collecting information and getting in touch with an external institution also cause difficulties.

In our online exploratory research, apart from the school-organised out-of-school activities and programmes' organisation practice, we also examined their pedagogical effect from cognitive and non-cognitive aspects alike. The results of *The effect of the specific out-of-school programme* survey (Block III) support the visions of meta-analyses and research reviews (Becker, Lauterbach, Spengler, Dettweiler & Mess, 2017; Hattie, Marsh, Neill & Richards, 1997; Rickinson et al, 2004, etc.), namely that out-of-school programmes might become efficient complements to school education in several fields of life, therefore in social, affective and cognitive aspects, too. Examining the three factors of the scale we can see that the pupils, teachers and heads of schools all find out-of-school learning most efficient from social learning's point of view; then on the pupils' sub-sample it is followed distantly by the cognitive and more closely by the affective factors. In the teachers' opinion though all three factors are equally

significant, and they rated them in the following order: social attainment of information, affective and cognitive aspects. All of these strengthen the double function of out-of-school learning's locations: educating while entertaining (edutainment, see e.g. Eshach, 2007; Hofstein & Rosenfeld, 1996).

In the evaluation of out-of-school learning's efficiency several background factors may play a part, consequently we involved other items – possible influencing factors – in our online questionnaire: students' attitude towards school and out-of-school programmes, applied teaching-learning methods during the activities and the reason for organising the activity itself. Contrary to our previous expectation, according to the multi-variant regression-analysis the attitude in schools explains more the evaluation of out-of-school activities than the attitude toward the programme itself. The number of visited locations has also proven to be a considerable influencing factor, that is, the amount of locations visited by students plays an important role in the evaluation of learning there, which verifies the significance of varied environment in learning processes. The willingness to participate in out-of-school programmes in the future can only be explained by the students' attitude towards the programme.

Table 3. The hypotheses and their verification connected to the online exploratory research based on the results

	Hypothesis	Verification of the hypothesis		
		V	N	P
H ₁	The reliability-indices of the online survey according to target groups are appropriate.	X		
H ₂	The Likert-scales are appropriate for factor-analysis, based on whose results the scales' items form definite factors in harmony with our theoretical model, which suggests the inner consistency of the questionnaire.			X
H ₃	Out-of-school activities take place in the primary school's lower- and upper classes in accordance with the minimum directives of the 2012 National Curriculum regarding their topic, location and frequency, i.e. maximum 3-5 times/school term/level of education, mainly connected to scientific and historic topics.	X		
H ₄	The most frequent target locations of out-of-school visits are museums, galleries, theatres and zoos.	X		
H ₅	The location of the out-of-school occupations and the number of visits are influenced by the school type of settlement.			X
H ₆	The activities and visits take place mainly during class trips.			X
H ₇	During out-of-school activities passive teaching and learning methods dominate from the pupils' side, therefore lectures and guidance are the main methods to be mentioned.			X
H ₈	The teacher assistant staff's presence has a positive effect on the implementation of out-of-school programmes, therefore the students of those schools which hire a recreation organiser, laboratory assistant, librarian or museum pedagogue usually get to more varied locations and/or more often.			X
H ₉	Out of the hindering factors listed in the questionnaire mainly finding funds and fitting the activity into the curriculum are problematic for teachers.	X		
H ₁₀	Pupils' out-of-school attitude is higher than those of inside school.	X		
H ₁₁	Girls' attitude toward out-of-school and in-school learning is higher than boys'.	X		
H ₁₂	With increasing school years, students' attitudes to out-of-school programmes are reduced.	X		
H ₁₃	The majority of respondents of all three partial samples would like to participate in out-of-school programmes more often in the future.	X		
H ₁₄	Teachers and heads of schools have a more positive opinion on the efficiency of out-of-school education than pupils. This difference is mainly significant in the cognitive area.	X		
H ₁₅	All three partial samples find out-of-school activities efficient mainly in social and affective areas.			X
H ₁₆	According to the results of the general attitudes toward out-of-school programmes students have a positive opinion on out-of-school learning from a social, whereas teachers and heads of schools from an educational point of view.			X
H ₁₇	Out-of-school habits (especially the frequency, the variety of visited locations and teaching-learning methods) and students' attitudes towards out-of-school learning influence the evaluation of out-of-school education's efficiency.			X
H ₁₈	Out-of-school visiting habits, the evaluation of the activities' efficiency and the attitudes towards out-of-school learning have influence on future potential participation.			X

Legend: V=verified; N=not verified; P=partially verified.

The results of the paper-based longitudinal study

Data analysis was carried out with the methods and programmes already presented above. The qualitative data in the dissertation are to highlight the picture drawn by the quantitative results, as well as to verify or defy the measured data. We did not undertake the task of making the qualitative data numerical and so transforming them into quantitative ones and statistically analysing them in this thesis.

According to our cumulated experience on the effect of out-of-school learning activities on student performance, although the pupils' average results significantly increased during the immediate post-testing in all programmes' case, this extra knowledge proved to be less than what we had previously expected. On the other hand, paper-and-pencil performance tests do not evaluate experiences gained through out-of-school learning appropriately in themselves (Bitgood, 2011). If we take the *Attitudes toward out-of-school learning programme* questionnaire's (V) results recorded during post-testing into consideration, it turns out that both the escorting teachers and the pupils find the programmes very positive from a didactic perspective, too. An interesting and unexpected result was that all programmes' didactic factor's aspects were ranked higher by the pupils than those of the social one; plus, significant increase was mostly experienced in this field compared to the data of pre-testing. This means that the pupils primarily acknowledged the activities as a good and efficient learning opportunity, which were not only spectacular and entertaining for them, but effective from a cognitive side by helping understand the curriculum, by creating a marvellous opportunity for learning and by making the curriculum more interesting and more enjoyable.

The fact that unexpected situations arose in several programmes' case might have played a role in the significant but moderate cognitive student performance's increase measured by the tests. According to observers, exciting sights diverted the pupils' attention from learning. At the same time the qualitative data (observers' and pupils' reports) show that the beneficial effect of novelty space (see Eshach, 2007) was felt during the activities; and that the information which were largely new to the pupils and could be experienced through multiple sensing organs (e.g. turtle-shell) were absorbed better and were longer-lasting, according to the results of post-testing.

Apart from environmental circumstances and instructional factors the activity's didactic characteristics (e.g. the expertise and preparation of the instructors, or the applied teaching-learning methods – didactical factor), plus the pupils' cognitive and non-cognitive previous expectations and experiences (personal factor) and social relationships (social factor, e.g. teacher-pupil interaction, co-operation with others, etc.) might also have influenced the cognitive performance. On the whole, however, the activities' didactic characteristics – not counting minor methodological problems and difficulties – must have influenced the learning process in a more positive way, rather than making it more difficult. Contrary to our previous expectation, although the evaluation of aspects related to the activities' social environment was slightly less than those of the didactical and environmental factors, it scored an average over 3,00 on the 4-point Likert scale, which also goes to show that it could not possibly have influenced the test results of the majority of pupils in a negative way.

All the data from pupils, their teachers and outside observers verify the fact that the pupils showed great interest in the activities, enthusiastically and actively participated in the tasks, the motivating factor of being outside the school truly had its effect on them, so much

that they had to be somewhat restricted by directing their attention in a more focused way. It turns out from the qualitative data that out-of-school activities were popular and successful for the participants not only because of new information and an environment abundant in stimuli, but also because they provided an authentic learning opportunity through direct gaining of experience.

The verification of the hypotheses connected to the longitudinal study is illustrated in the following table (4).

Table 4. The hypotheses and their verification related to the online exploratory research, based on the results

	Hypothesis	Verification of the hypothesis		
		V	N	P
H ₁₉	The reliability-indices of the paper-based survey's questionnaires are appropriate.			X
H ₂₀	Based on the results revealed with the help of the online questionnaire we suppose that mainly the active learning methods dominate during the activities. Frontal teaching (teacher's lecture and explanation) also appears, but in a more interactive form than in classrooms, with more illustration.	X		
H ₂₁	The evaluation of out-of-school learning is more positive after the activities, due to fresh experiences, than during pre-testing, then a slight decline is detected in the results of the delayed post-testing.	X		
H ₂₂	According to the results of the evaluation of out-of-school activities questionnaire, both partial samples evaluate out-of-school learning in the most positive way from the activity's physical settings point of view. Following that, pupils have a positive opinion on out-of-school learning from social, whereas teachers and heads of schools from educational aspects.		X	
H ₂₃	The difference between the results of some partial samples (pupils, teachers, observers) is slightly less, owing to direct experiencing, than during the online testing..	X		
H ₂₄	During the activities the students show interest, they are motivated and co-operative, they learn actively.			
H ₂₅	A one-time activity does cause a slight increase in pupils' subject attitudes and intrinsic motivations, which will be no longer detected during the delayed post-tests.		X	
H ₂₆	In the pupils' reports the positive experiences dominate. Pupils primarily report the affective effects of the activities. The reflection connected to cognitive gaining of information only appears in the reports if the attainment of information was related to special, intensive experience originating from the activity's environment or other specialities elaborated on in the theoretical chapters (e.g. attractions, sudden events, experience via different sensing organs, etc.)	X		
H ₂₇	The statements and aspects claimed in the reports are more general, less definite during the delayed post-testing than during the immediate post-testing.	X		
H ₂₈	The pupils' cognitive performance shows improving tendency because of the activities: the pupils' marks increased in the immediate and delayed post-testing compared to those in the pre-testing.	X		
H ₂₉	As an effect of experiences and direct gaining of experiences the attained information during the activities are long-lasting: even if during the delayed post-testing the pupils' cognitive results decline a little, the loss of knowledge is not significant.	X		
H ₃₀	According to the reports of observers, the effect of didactical and instructional factors can be outlined (e.g. handling unexpected situations, planning and organising the activity) and they appear in the evaluation of out-of-school activities as well as in the pupils' performance.	X		

Legend: V=verified; N=not verified; P=partially verified.

Summary

Based on the two examinations' results we can say that the teachers, pupils and heads of schools all had very positive opinions on the out-of-school activities from cognitive and non-cognitive aspects alike and would like to take part in similar activities in the future, too. The pupils' achievement tests and reports, plus the outside observers' experiences all support this positive claim, since the observed out-of-school activities were all successful in reaching cognitive and affective pedagogical aims. In spite of this classes rarely, only occasionally get to programmes organised outside the classroom, which usually happen as passive visits of locations – this, unfortunately, bears little pedagogical value (Tóthné Timár-Geng, 2009). At the same time, the results of the longitudinal study clearly show that active, spectacular out-of-school programmes which involve several sensing organs, build on experience-learning and are rich in experience are really efficient in improving the non-cognitive factors of learning; plus, also proved to be fruitful regarding knowledge-tested, declarative knowledge augmentation, though to a somewhat lesser degree. The examination of effects on more complex areas of cognitive knowledge (e.g. problem solving, recognising correlations, application of acquired knowledge) is not possible via the data collection and results presented in the dissertation, more research is needed for that.

The results of the paper-based longitudinal study altogether support out-of-school learning's characteristics elaborated on in the theoretical chapters and its beneficial effects on students, primarily on the effective dimensions, but on the cognitive performances too. It was proven that the spectacular environment with plethora of stimuli and different from the classroom stimulates the students who, besides many authentic experiences, gained relevant and useful knowledge during the activities, therefore learning and entertainment do not exclude each other at all. The results of our large-sampled empirical research show in accordance that the variety of learning environment has the same, or even bigger importance in evaluating the activities' pedagogical usefulness as the applied teaching-learning methods or the student attitudes towards out-of-school learning. This all underlines the fact that it would be worth enriching school education with the numerous possibilities of out-of-school learning.

By overcoming the main barriers indicated by the teachers and heads of schools, and with necessary educational political and financial support out-of-school learning could be an efficient supplement to classroom education, by which the students' interests and learning ability will be maintained, and also the gap between abstract science knowledge and everyday knowledge will be bridged. As we can see in the results of our empirical research, out-of-school non-formal learning locations, with their learning environments different from those of schools, provide many opportunities to complement school education. The huge abyss between out-of-school learning's pedagogical potential and its practical implementation (Waite, 2009) should be bridged by a more target-oriented and more planned integration of out-of-school education on non-formal locations into formal education.

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