

# **HEAD IN THE CLOUDS**

**EVALUATION APPROACH, OUTCOMES  
AND RECOMMENDATIONS**

# HEAD IN THE CLOUDS

## EVALUATION APPROACH, OUTCOMES AND RECOMMENDATIONS



### I. WHY TO EVALUATE

Evaluation was considered a key component of the Head in the Clouds project, to be able to understand whether the educational material and the approach were actually usable and useful in reaching the impact that we aimed for under the social, economic and geographical conditions of the participating children. Soft skills and lacking self-esteem were identified as deficits that prevented learning and school success under these conditions. It is for this reason that the consortium decided to focus its evaluation efforts on holistic and transversal competences which were summarized under the term learner autonomy.

During the Head in the Clouds project, students engaged in various activities and solved different tasks. The work they did was tracked via QR codes printed on every task. This way, it was possible to evaluate which tasks they engaged in, how they approached them and what “hard skills” they learned. However, the main focus of the evaluation weren’t “hard skills”, but the so-called learner autonomy, i.e. the ability to learn autonomously and efficiently.

The main research questions of the project were:

- Did learner autonomy improve in the course of the project?
- Is the level of learner autonomy correlated with certain personality traits?
- Is the level of learner autonomy related to the activity undertaken?

The evaluation plan was designed in such a way so as to provide answers to these questions while respecting the limitations and challenges of the locations where the project was taking place.

The main limitations were personal and technical. In an ideal world, we would have a control group, i.e. we would divide children into two groups with similar starting levels of learner autonomy. This way, it would be possible to determine how much the learner autonomy changed thanks to the participation in the project itself and how much it increased due to other factors such as children’s natural mental development. Unfortunately, this would mean denying half the children the opportunity to participate in an enriching and unique experience the project offered, so we decided against this approach. On top of that, dividing the children into two non-overlapping groups might not even be practically possible since they all know each other and live near each other.

Another factor that complicated our research was the fact that the sample size was quite small. This was, once again, caused by the nature of the locations. Children who participated in the project often had other obligations (e.g. they needed to take care of younger siblings), therefore they sometimes skipped the project sessions. Some children from the community could not join at all. The project was all conducted on a voluntary basis, so no children could be forced to participate.

In addition, there were many technical limitations (such as slow wi-fi connection and lack of computers), which we also needed to take into account when designing the evaluation manual.

To sum up, the evaluation needed to be a compromise between the desire to stick to rigorous academic methods (good sample size, detailed data, control groups) and practical reality of the locations where the project was taking place.



**Picture 1: The Koros Patak village in Romania where most of the children live**

## II. WHAT IS LEARNER AUTONOMY

The opinions on what exactly the learner autonomy is and what it consists of differ – there is no clear, unified definition. In addition, learner autonomy is typically defined in the context of language learning so the literature on this matter is limited.

Therefore, as a first step, we needed to define the concept of learner autonomy that was going to be used in the context of the project as there was no definition in the literature that would suit our needs. Our definition was based on the papers and books in the chapter sources, at the end of this document.

After studying the resources listed above, we defined the learner autonomy as a concept consisting of seven domains. These domains were chosen in such a way so as to be easily observable and measurable, because the evaluation was going to be done by external (teacher) observation. This list of domains is essentially a compromise between the need to have a straightforward, easily observable concept and the desire to capture the learner autonomy in its complexity. The seven domains are as follows:

1. the ability to set meaningful and achievable goals
2. the ability to find ways to reach a goal
3. the ability to identify a source of failure

4. the ability to learn from one's mistakes
5. the ability to see mistakes as an opportunity for improvement
6. the ability to work independently towards reaching a goal
7. the ability to evaluate if a goal has been reached

These domains are described in more detail in the following section.

### III. EVALUATION APPROACH

The evaluation consisted of:

- (1) **Quantitative data** (which tasks were done by whom and 3 questionnaires on learner autonomy, personality and accomplishment administered on a regular basis, each of which is described below).
- (2) **Qualitative data** (live observations, interviews with children and educators, and written reports from educators).

In addition, demographic data (age, gender...) was collected during the initial needs assessment stage prior to the beginning of the evaluation.

Children must be given the opportunity to have their data collected anonymously. In our project, we used personalized stickers. Each child chose a sticker with a symbol (flower, bird etc.) that was then used to identify which child took a particular video, photo or did a certain task etc. Children simply included the sticker in the photo, video etc.

*The following explanations give you an overview  
of what we aimed to do, what we did and what we recommend you to do.*

#### 1. Questionnaires

##### LEARNER AUTONOMY QUESTIONNAIRE

The goal of this questionnaire was to track students' progress in their level of learner autonomy.

##### *WHEN*

The original plan was to administer this questionnaire four times throughout the project. However, it has been shown that the level of learner autonomy varies greatly with each task undertaken. Therefore, we would recommend teachers to administer the questionnaire *after each box* and to evaluate the level of learner autonomy with respect to the activities in that particular box.

In the case of our project, each location approached the evaluation in their own way: in Slovakia, teachers filled in six autonomy questionnaires, one after each box. In Romania, they filled in the questionnaire five times throughout the project and the evaluation wasn't necessarily linked to any particular box. In Kosovo, it was soon clear that quantitative evaluation is not the best approach due to the nature of the location so qualitative evaluation was used instead.



- Right side: **The child sets reasonable goals.** They can come up with goals they want to reach or activities they want to do on that day themselves. They can evaluate whether a goal is attainable and realistic.

## 2. the ability to find ways to reach a goal

After a goal has been chosen or a task has been set, ask the child how they are going to complete it.

- Left side: **The child needs to be told how to reach a goal.** The child does not come up with ideas on how to complete the task. They need to be told what to do. They cannot make links between tasks, activities and goals. They jump from one thing to another. They repeatedly and considerably overestimate or underestimate their abilities.
- Right side: **The child is able to determine how to reach a goal.** The child comes up with one or more ideas on how to reach the goal or complete the task. The child can evaluate several strategies and pick the most appropriate. They have a good sense of how a task, activity or goals are related to one another. They make realistic estimates of work, time and effort needed. They have a good sense of causality patterns (“if-then”).

## 3. the ability to identify a source of failure

When the child makes a mistake, ask him/her why it happened.

- Left side: **The child doesn't know what went wrong.** They cannot distinguish between “correct” and “wrong”. They tend to blame themselves for mistakes (“Because I am stupid.”) or others (“You are wrong, I did it right. You don't like me. You are giving me a task that is too difficult.”).
- Right side: **The child understands what went wrong.** They can easily distinguish between “correct” and “wrong”. They can explain what went wrong (e.g. “I didn't know how exactly I should do this part of the task.”). They have a good sense of estimating their own abilities and external factors.

## 4. the ability to learn from one's mistakes

Observe whether the child tends to make the same mistakes over and over again.

- Left side: **The child repeats the same mistakes.** They keep making the same mistakes. They only seem to focus on mistakes when they have appeared or have been pointed out.
- Right side: **The child learns from past mistakes.** They try to avoid past mistakes. They try to anticipate possible future mistakes. They come up with ideas on how to avoid / remedy possible problems.

## 5. the ability to see mistakes as an opportunity for improvement

Observe the reaction of the child when they make a mistake.

- Left side: **The child is frustrated by mistakes.** They look sad, disappointed and frustrated. They become quickly disappointed and frustrated when informed about an error. Their frustration hinders them from further work / progress. The child tends to stop doing whatever they are doing.

Teacher's intervention is needed to persuade the child to start working again. Sometimes a change in activity is necessary to calm the child down.

- Right side: **The child keeps thinking about how to improve.** They seem determined to do better next time. They seem to be thinking about how to improve. The child says things like "I messed it up so next time I am going to do it better." The child wants to keep working. When informed about a mistake, they do not become frustrated.

#### 6. the ability to work independently towards reaching a goal

Observe the child when trying to complete a task / reach a goal.

- Left side: **The child needs to be pushed.** They need a push to get started. When left alone, they fool around or become disruptive. They are easily distracted. Their attention span is below average for the given age.
- Right side: **The child works independently towards reaching a goal.** They do not need a push to get started. When left alone, they work smoothly on their own. They can handle distractions. Their attention span is appropriate / above average for the given age.

#### 7. the ability to evaluate if a goal has been reached

Monitor if the child has accomplished the task which they set before.

- Left side: **The child cannot determine if a goal has been reached.** They cannot assess themselves if a task has been completed or not. The child does not admit they did not complete a task. If reminded that the task is not complete, they don't know what it takes to complete it. They tend to present results very fast, believing they are correct, without having the slightest idea they are wrong.
- Right side: **The child can determine if a goal has been reached.** They can assess whether a task is completed or not. They can explain why. If explained, they can admit they did not complete a task. If a task is not completed, they come up with ideas how to complete it.

Students can get 0 to 3 points for each of the seven domains, which means their total autonomy score is on a scale from 0 to 21.

### ACCOMPLISHMENT QUESTIONNAIRE

The goal of this questionnaire was to track students' opinion on the boxes and their content.

#### *WHEN*

This questionnaire should be filled in after each box.

#### *HOW*

For each student, fill in his or her attitude towards the boxes regarding how difficult it was for them, how much they learned and how much they liked the box. Fill in the questionnaire based on your observations of the students while they were working with the boxes.

Fill in this questionnaire using an Excel table with three sheets:

THE BOX WAS DIFFICULT			THE BOX WAS EASY	
		NAME/NICKNAME		
	x	SAMPLE_NAME		

LEARNED LITTLE			LEARNED A LOT	
		NAME/NICKNAME		
	x	SAMPLE_NAME		

DISLIKED THE BOX			LIKED THE BOX	
		NAME/NICKNAME		
	x	SAMPLE_NAME		

**Table 2: Accomplishment questionnaire**

### PERSONALITY QUESTIONNAIRE

The aim of the personality questionnaire was to determine whether the level of learner autonomy is related to a child's personality.

#### WHEN

This questionnaire should be filled in during or after each box. Originally, we planned to only have one personality questionnaire as we assumed personality traits were rather stable. However, teachers pointed out that children can act very differently depending on the task undertaken: with some tasks, they may prefer working in a group, while with other tasks, they may prefer individual work. That is why we decided to administer one personality questionnaire with each box.

#### HOW

The Excel questionnaire consists of 4 sheets. On each sheet, there is a list of students' nicknames, a pair of personality traits (systematic vs. spontaneous, prefers working alone vs. prefers working in a group, likes to win vs. likes to play, likes to think vs. likes to act) and a 5-point scale. For each student, the teacher should type "x" into the cell which best reflects the behaviour of the student when working with the box directly preceding the evaluation.

For example, if the teacher believes a student is very systematic, they should type "x" into the cell on the left. If they believe he/she is a bit more spontaneous than systematic, they should type "x" into the second cell

from the right. Note that the two adjectives describing personality traits are always related but none of them is superior to the other.

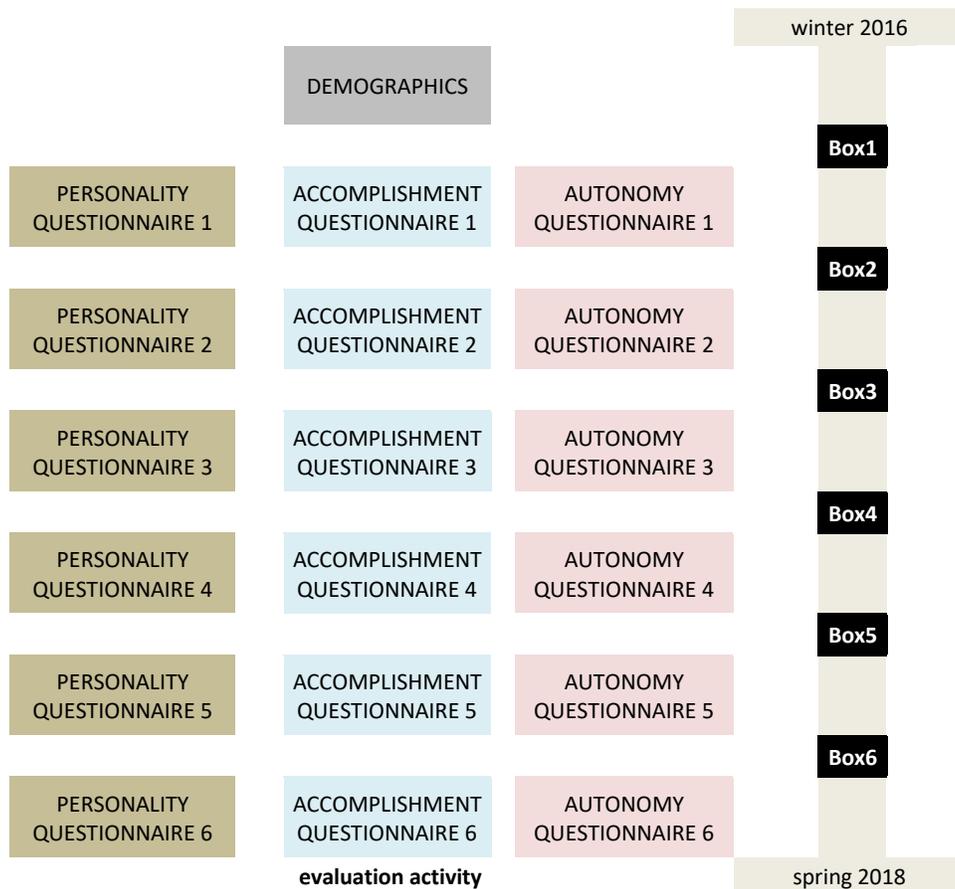
These “x” are consequently transformed to a number on a scale from 0 to 4. The closer the score is to 0, the better the student is described by the left adjective, and the closer the score is to 4, the better they are described by the right adjective. It needs to be stressed out once more, however, that a higher “score” in this case does not mean a better score. It is simply a number describing how well the student can be described by the right adjective.

NICKNAME	PERSONALITY QUESTIONNAIRE 1				
SAMPLE NAME	x				
SAMPLE NAME 2				x	

**Table 3: Personality questionnaire**

**TIME PLAN**

The following table contains a summary of the evaluation process implemented during the project period.



**Table 4: Evaluation Time Plan**

## 2. Learning Analytics:

The aim was to find out what activities the children did and how did this develop their competencies. It was important for us – accordingly to John Hattie – to make the learning of the children visible<sup>1</sup>.

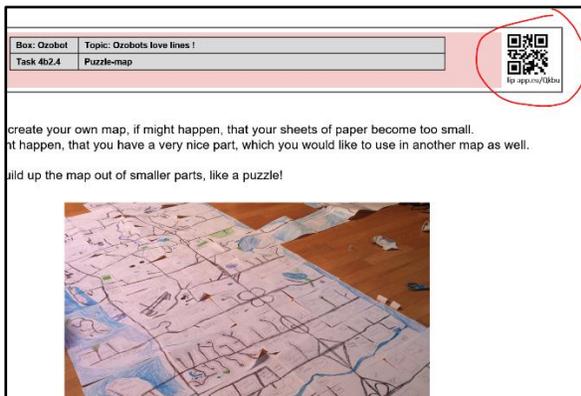
In order to do so, we had to find a way to track the children’s activities. As the project proposal suffered budget cuts that concerned mainly the IT equipment, we had to refrain from the original idea that most of the activities would happen online and we had to find a way to track tasks that were performed offline.

We came up with the decision to deliver the learning material as well as the assignments in the form of “tasksheets” and print a QR-code on each sheet.

### THE HAND-IT-IN-APP

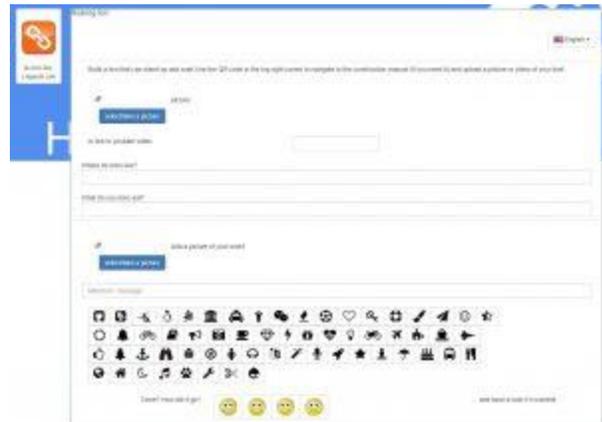
The Hand-it-in-App is an online application that allows children to “hand in” their work by scanning the QR code of the related task sheet.

When following the QR code on a specific task sheet, kids reach a page that contains the digital version of the task. In the user interface, children can identify themselves by choosing their personal icon (sticker). Then they can provide results (answer questions, upload pictures, provide links to videos), write feedback and tick a smiley to indicate how much they liked the task.



Picture 2: a QR-code on each tasksheet

The QR-codes led to a website:



Picture 3: the website

### THE COMPETENCY FRAMEWORK

We decided to use an existing competences framework instead of inventing a new one. As the boxes covered quite a large variety of topics and transversal skills, we chose the “21st century skills” framework of the University of Melbourne, which is very general and holistic. We liked its approach to not only include knowledge but also skills and attitudes. Our boxes covered about two thirds of its categories, and we added six to cover all our boxes.

<sup>1</sup> <https://visible-learning.org/>

The 15 most often used competencies were:

competency
Follow instructions (e.g. tutorial video or instruction manual)
Develop, implement and communicate new ideas to others effectively
Infer. Query evidence, conjecture alternatives and draw conclusions.
Use technology as a tool to research, organize, evaluate and communicate information
Improve handicraft skills
Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems. Examine ideas, identify and analyse arguments.
Ability to concentrate for extended as well as short periods of time.
Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation
Be open to non-familiar, unconventional and innovative solutions to problems and to ways to solve problems
Confidence when speaking in public.
Prioritize, plan and manage work to achieve the intended group result
Logical thinking (Programming) - formulate algorithms in various forms
Monitor, define, prioritize and complete tasks without direct oversight
Know when it is appropriate to listen and when to speak Work effectively in diverse teams
Use technology as a tool to research, organize, evaluate and communicate information

**Table 5: Top 15 competencies from defined tasks**

However, as not all the tasks were actually performed (the locations were free to select which tasks they wanted to offer), the list of actually addressed competencies was smaller. The top 15 of this list were:

competency
Ability to read and understand different texts, adopting strategies appropriate to various reading purposes (reading for information, for study or for pleasure):
Sound knowledge of basic vocabulary, functional grammar and style, functions of language.
Ability to concentrate for extended as well as short periods of time.
Know a wide range of idea creation techniques (such as brainstorming)
Know when it is appropriate to listen and when to speak Work effectively in diverse teams
Speak with clarity and awareness of audience and purpose. Listen with care, patience and honesty
Act responsibly with the interests of the larger community in mind
Follow instructions (e.g. tutorial video or instruction manual)
Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems. Examine ideas, identify and analyse arguments.
Be open to non-familiar, unconventional and innovative solutions to problems and to ways to solve problems
Improve handicraft skills
Ask significant questions that clarify various points of view and lead to better solutions
Be open to new and worthwhile ideas (both incremental and radical concepts)
Create new and worthwhile ideas (both incremental and radical concepts)
Develop, implement and communicate new ideas to others effectively

**Table 6: Top 15 competencies from performed tasks**

## EVALUATIONS

As we knew for each task which competencies it addressed, we could easily produce charts that showed an overview of student's addresses competencies, like the one in the following Table 7.

CloudLearning_Ecop_ko		Student1	Student2	Student3	Student4	Student5	Student6	Student7	Student8	Student9	Student10
1.1_A	Be open to new and worthwhile ideas (both incremental and radical concepts)	0	0	0	0	0	0	0	1	1	0
1.1_K	Know a wide range of idea creation techniques (such as brainstorming)	4	3	2	2	0	1	3	1	0	1
1.1_S	Create new and worthwhile ideas (both incremental and radical concepts)	0	0	0	0	0	0	0	1	1	0
1.3_A	View failure as an opportunity to learn - understand that creativity and innovation is a long-term, cyclical process	0	0	0	0	0	0	0	0	0	0
2.1_A	Consider and evaluate major alternative points of view	0	0	0	0	0	0	0	1	1	0
2.4_A	Be open to non-familiar, unconventional and innovative solutions to problems and to ways to solve problems	3	1	0	3	2	0	5	1	0	0
2.4_K	Ask significant questions that clarify various points of view and lead to better solutions	0	1	0	0	0	0	0	0	0	0
2.5_A	Ask meaningful questions that clarify various points of view and lead to better solutions	0	1	0	0	0	0	0	0	0	0
2.8_S	Explain. Stating results, justifying procedures and presenting arguments.	0	0	0	0	0	0	0	0	0	0
3.2_S	Ability to concentrate for extended as well as short periods of time.	5	3	1	0	1	4	2	0	1	0
3.4_S	Ability to communicate as part of the learning process by using appropriate means (intonation, gesture, mimicry, e	0	0	1	0	0	0	0	0	0	0
4.3_S	Ability to read and understand different texts, adopting strategies appropriate to various reading purposes (reading	5	3	2	0	1	4	2	0	1	0
4.4_K	Sound knowledge of basic vocabulary, functional grammar and style, functions of language.	5	3	2	0	1	4	2	0	1	0
5.1_K	Know when it is appropriate to listen and when to speak Work effectively in diverse teams	0	1	2	1	1	0	0	1	1	2
5.1_S	Speak with clarity and awareness of audience and purpose. Listen with care, patience and honesty	0	1	2	1	1	0	0	1	1	2
5.6_A	Act responsibly with the interests of the larger community in mind	0	1	1	1	1	0	0	1	1	2
6.1_A	Propensity to use information to work autonomously and in teams - critical and reflective attitude in the assessme	0	0	0	0	0	0	0	0	0	0
6.7_K	Use technology as a tool to research, organize, evaluate and communicate information	1	1	2	1	1	0	0	0	0	2
6.8_K	Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social n	1	1	2	1	1	0	0	0	0	2
9.7_S	Monitor, define, prioritize and complete tasks without direct oversight	0	0	1	1	0	0	0	0	0	0

Table 7: Competency evaluation for EKOPOLIS Box

The other evaluation showed which tasks were already done by which students:

CloudLearning_Ecop_ko	Student1	Student2	Student3	Student4	Student5	Student6	Student7	Student8	Student9	Student10	Student11	Student12	Student13	Student14	Student15	Student16
BOX: 5_Ecopolis - TASK: 5c1-5.4 - Advantages & Disadvantages																
BOX: 5_Ecopolis - TASK: 5c1.1 - Brainstorming - On my way to school	✓		✓			✓	✓	✓		✓					✓	✓
BOX: 5_Ecopolis - TASK: 5c1.2 - Brainstorming - On my way to school			✓	✓			✓								✓	✓
BOX: 5_Ecopolis - TASK: 5c1.3 - Brainstorming - On my way to school			✓													
BOX: 5_Ecopolis - TASK: 5c2.1 - Map - My way to school	✓	✓	✓								✓	✓	✓		✓	
BOX: 5_Ecopolis - TASK: 5c3-2.2 - People Work - Worksheet																
BOX: 5_Ecopolis - TASK: 5c3-4.2 - The super Jobs - Worsheet																
BOX: 5_Ecopolis - TASK: 5c3-6.1 - Work - Worksheet																
BOX: 5_Ecopolis - TASK: 5c3-7.2 - What Will I Be When I Grow Up - Wor																
BOX: 5_Ecopolis - TASK: 5c3-8.2 - Kitty's-Dream-Job - Worksheet																
BOX: 5_Ecopolis - TASK: 5c3-9.1 - My Dream job																
BOX: 5_Ecopolis - TASK: 5c3.1 - Green, Blue and Red Buildings in my hoi		✓												✓	✓	

Table 8: Performed tasks in EKOPOLIS Box

This helped the teachers to keep an overview of what was done and showed students how much they have already done and how much they still could do. (Sometimes these sheets where put on the wall.)

## LIMITATIONS

Although this system of tracking activities and evaluating competencies theoretically worked quite well, it showed some major weaknesses:

- Incompleteness of data: All three locations often had to deal with unstable or unavailable internet. If the hand-it-in-app was not available, then the teachers would have to manually take notes and enter the data later, as soon as the internet was available again. In this process, data was often lost.
- Too little added value: In the end, the evaluations did not produce enough added value to justify the additional effort of the hand-it-in-app (for teachers as well as for students) - especially under weak internet conditions (see above). We had several ideas how to improve the visualization of the learning progress in order to improve student's motivation but did not have time to put it into practice.

## 3. Interviews

One of the most efficient methods to get back feedback from the locations was to conduct interviews with the educators and teachers.

These were already planned in the original project plan and proved to be beneficial even more during the implementation. The reasons were as follows:

- Due to problems with electricity, internet connection and the like (which were not foreseen in the extent they occurred) leading to the fact that the previously envisioned evaluation via questionnaires did not work as planned, the interviews were the most efficient way to fill in lacking information.
- It provided vital background information (regarding children, locations, communities cultural and social aspects) for the evaluation as well as for further development of the boxes.
- Provided information that is not directly visible in the data and which otherwise might get lost or missinterpreted.
- Interviews with children further provided undistorted information on how children perceived the boxes personally and to which degree the boxes were beneficial to them.
- Provided a second point of view - the viewpoint of the children.

In retrospective the qualitative inputs helped to overcome the drawbacks of the small sample size of the quantitative data and helped with the interpretation.

## IV. EVALUATION RESULTS

In this section, we present the evaluation results for each of the three locations.

It is important to point out that each location was very different, which meant that the evaluation approach needed to be different as well. Let us provide a main summary of the character of the locations.

In Slovakia, the project took place in a school in the form of an after-school program, so the environment was quite structured and systematic, and the group of the kids was very stable. Teachers involved in the project worked with the same kids during standard school lessons, so the kids were used to asking the teachers for help, explanation etc. In other words, most of the day, the interaction between the kids and the teachers was in the form of frontal teaching, not in the form of SOLE method., so it was harder for teachers and kids to completely switch to SOLE. The kids who took part of the project were around the same age (14 years old). Unlike in the other two locations, the kids do not feel like they “belong to a community”. Their home environment is characterized by a lack of rules and mutually understood norms. When asked what they are going to do when they grow up, they typically say they are not going to work – for this reason, they feel little motivation to learn new skills because they don’t think they are going to need them anyway.

In Romania, the project took place in an after-school day centre. The kids were of different ages, but in general they were younger compared to Slovakia (around 9 years old). The environment was much more informal and less school-like. Normally, the kids would come, have a hot meal, do their homework and then engage in the project. Similarly to Slovakia, the group of kids in Romania was quite stable. One marked difference compared to Slovakia was that the kids all came from one community (the Koros Parak village) where the families know each other and where certain mutually accepted rules are still kept, so the children know where they belong and what is expected of them.

In Kosovo, the environment was the least structured out of the three locations. The project took place in Imaginatorium, a centre for children which provides a range of different activities. Normally, children would come and go as they needed, on a voluntary basis, so the group of kids involved in the project was very unstable. The Kosovo location is also marked by a strict adherence to unwritten rules and social norms (for example, girls are treated differently from boys, one child in the family is usually “the favourite one”, the oldest child is required to take care of younger siblings, girls are “sold” to be married for a certain amount of money etc.).

In all of the locations, children lack basic facilities (electricity, clean running water, let alone internet connection).

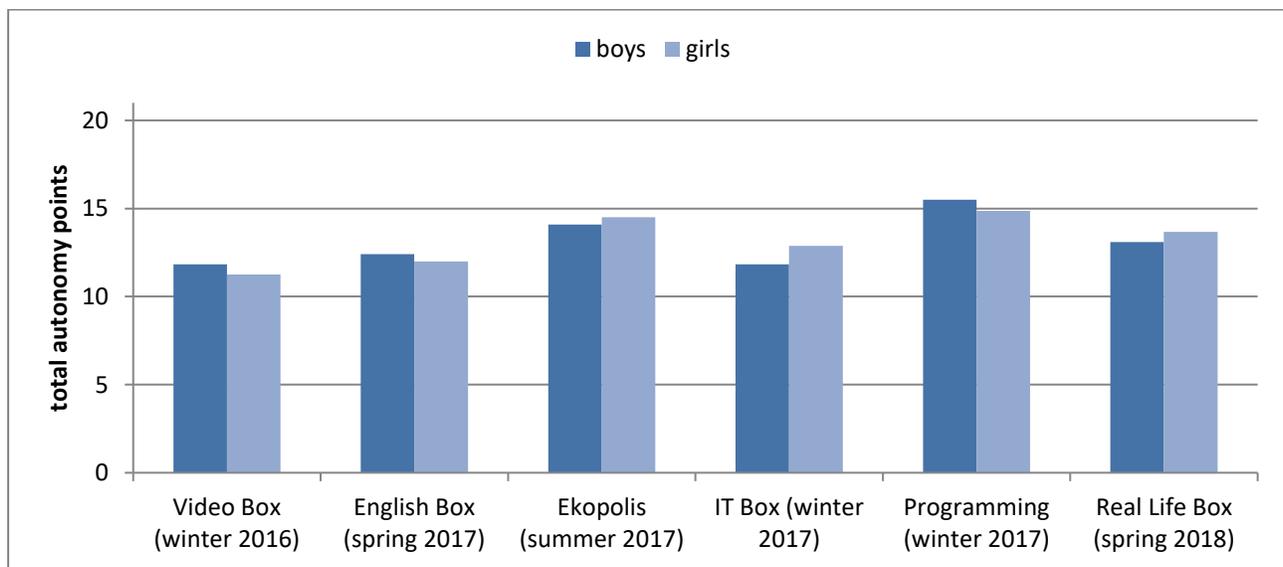
## 1. SLOVAKIA

Slovakia provided us with the biggest amount of data. By deviating from the original plan (instead of filling in autonomy questionnaires four times throughout the project, they filled in six questionnaires, one after each box), they offered invaluable insights into how much the learner autonomy actually correlates with the task itself.

There are 18 children for whom we have consistent data throughout the project (7 girls and 11 boys). Then there is one more boy and one more girl for whom there are some missing data.

### LEARNER AUTONOMY BY GENDER

Let us first discuss the development of learner autonomy of the Slovakian children. The first graph shows the average level of learner autonomy for boys and girls for each of the boxes. It can be seen that contrary to original expectations, the learner autonomy did not grow steadily – it fluctuated, depending on which box the students were working with.



**Graph 1: Average learner autonomy score by gender (Slovakia)**

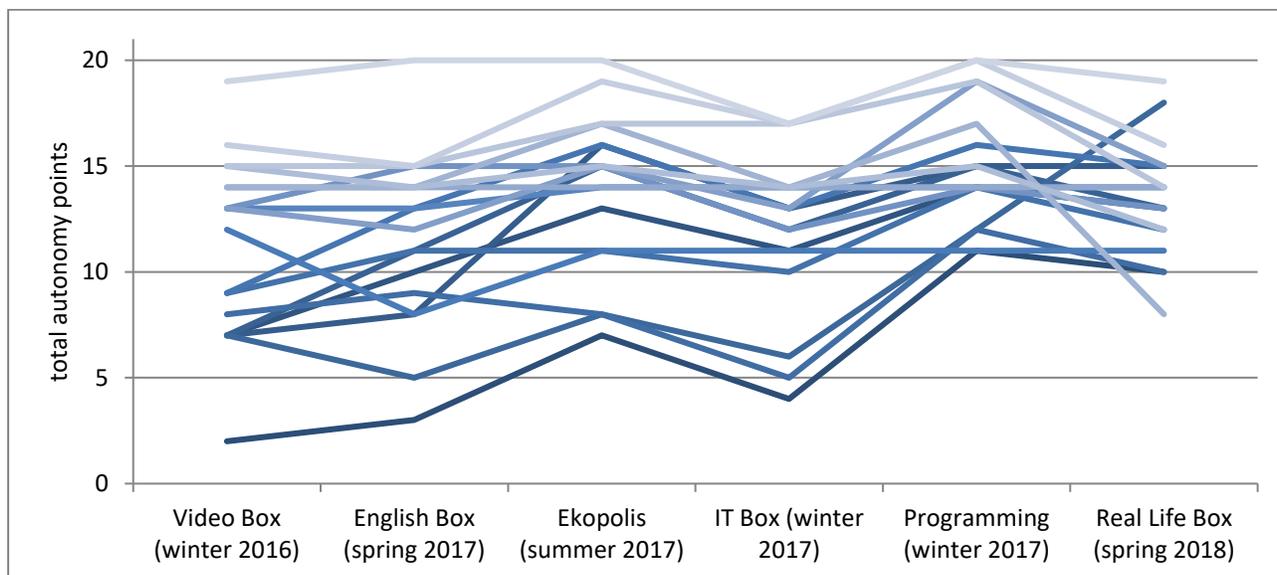
### INDIVIDUAL LEARNER AUTONOMY DEVELOPMENT

The second graph shows individual scores in learner autonomy for each of the children for whom we had complete data. In this graph we too can see that the learner autonomy does not grow steadily – it fluctuates.

When we compare the learner autonomy at the beginning and at the end of the project, there is an average improvement of 2.3 points. Unfortunately, since we didn't have a control group, we don't know how far this improvement was caused by the SOLE approach and how far it is a result of other factors, such as:

- the nature of the very first and the very last box, to which these autonomy scores are related;
- the fact that the children participated in various interesting activities and tried out new things;
- natural mental development.

However, it is important to mention that the average improvement in learner autonomy between the first and the last box among the children with low starting levels of learner autonomy (less than 10 points, which applied to 8 children) was 6.25. This increase is quite large, and it leads us to believe that the SOLE approach has indeed helped children with poor starting learner autonomy, but we do not have enough evidence to conclusively confirm or reject this hypothesis.



**Graph 2: Individual learner autonomy scores (Slovakia)**

### LEARNER AUTONOMY BY DOMAIN

The table 9 shows the average score (across genders) in each of the learner autonomy domains, which are as follows.

1. the ability to set meaningful and achievable goals
2. the ability to find ways to reach a goal
3. the ability to identify a source of failure
4. the ability to learn from one's mistakes
5. the ability to see mistakes as an opportunity for improvement
6. the ability to work independently towards reaching a goal
7. the ability to evaluate if a goal has been reached

The highest possible score in each domain is 3. We can see that the scores across domains are roughly comparable. The lowest score was obtained in *the ability to work independently towards reaching a goal*, suggesting this may be an area to focus on. By “independently”, we mean “without teachers”, not “without

other children”. We made sure that teachers understood what is meant by “independently” and that they supported cooperation and group activities.

Box	Domain						
	1	2	3	4	5	6	7
video	1.60	1.60	1.89	1.75	1.75	1.50	1.60
English	1.60	1.55	2.15	1.80	1.75	1.60	1.80
Ekopolis	1.95	2.10	2.15	2.35	2.05	1.85	1.80
IT	1.80	1.30	1.90	1.85	1.95	1.75	1.70
Programming	1.95	2.10	2.40	2.40	2.10	2.15	2.15
Real Life	1.95	2.10	2.00	1.75	2.00	1.60	1.95
mean	1.81	1.79	2.08	1.98	1.93	1.74	1.83

**Table 9: Average learner autonomy score by domain (Slovakia)**

## LEARNER AUTONOMY AND PERSONALITY TRAITS

The table below shows the correlation matrix between different personality traits and learner autonomy. The personality traits were as follows:

- preference of individual work vs. preference of group work (the higher the score, the stronger the preference towards group work);
- systematic vs. spontaneous approach (the higher the score, the stronger the preference towards spontaneity);
- the desire to “just play” vs. the desire to win (the higher the score, the stronger the inclination towards the desire to win);
- preference of acting (i.e. “doing something”) vs. preference of thinking (the higher the score, the stronger the inclination towards thinking).

The correlations of these traits with the total learner autonomy score can be found in the first column. All the available input data (for each child, each box) were used to calculate these correlations.

In Slovakia, there is quite a strong correlation between the level of learner autonomy and spontaneity (the *less* spontaneous the child, the higher their level of learner autonomy) and between the level of learner autonomy and the inclination to thinking (the *higher* the inclination to thinking, the higher the level of learner autonomy).

However, let us mention again that these conclusions are based on quite a small sample size.

	<i>Learner autonomy</i>	<i>Preference of group-work</i>	<i>Spontaneity</i>	<i>Inclination to "winning"</i>	<i>Inclination to "thinking"</i>
<i>Learner autonomy</i>	1				
<i>Preference of group-work</i>	-0.14	1			
<i>Spontaneity</i>	-0.58	0.27	1		
<i>Inclination to "winning"</i>	0.07	-0.49	-0.10	1	
<i>Inclination to "thinking"</i>	0.64	-0.11	-0.69	0.01	1

**Table 10: Correlation of learner autonomy and personality traits (Slovakia)**

#### LEARNER AUTONOMY AND BOX CONTENT

The graphs below show how the level of learner autonomy is related to how the children perceived the boxes, as given by the results of the Accomplishment questionnaire, namely:

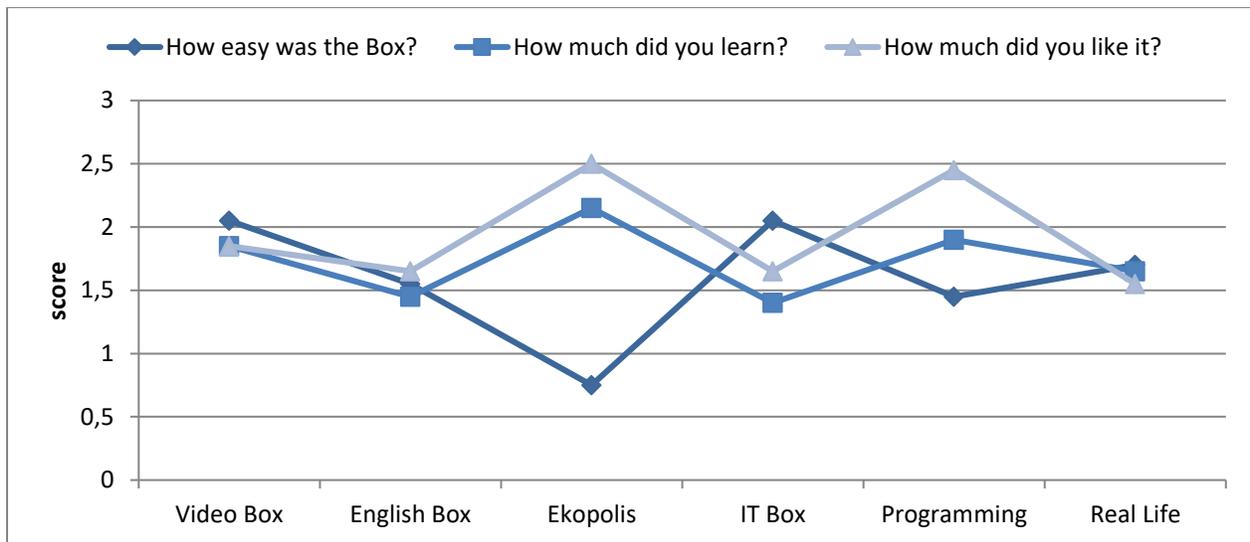
- how easy the box was (the easier, the closer the score to 3);
- how much they learned (the more they learned, the closer the score to 3);
- how much they liked the box (the more they liked it, the closer the score to 3).

Everything was based on teacher observation and evaluation.

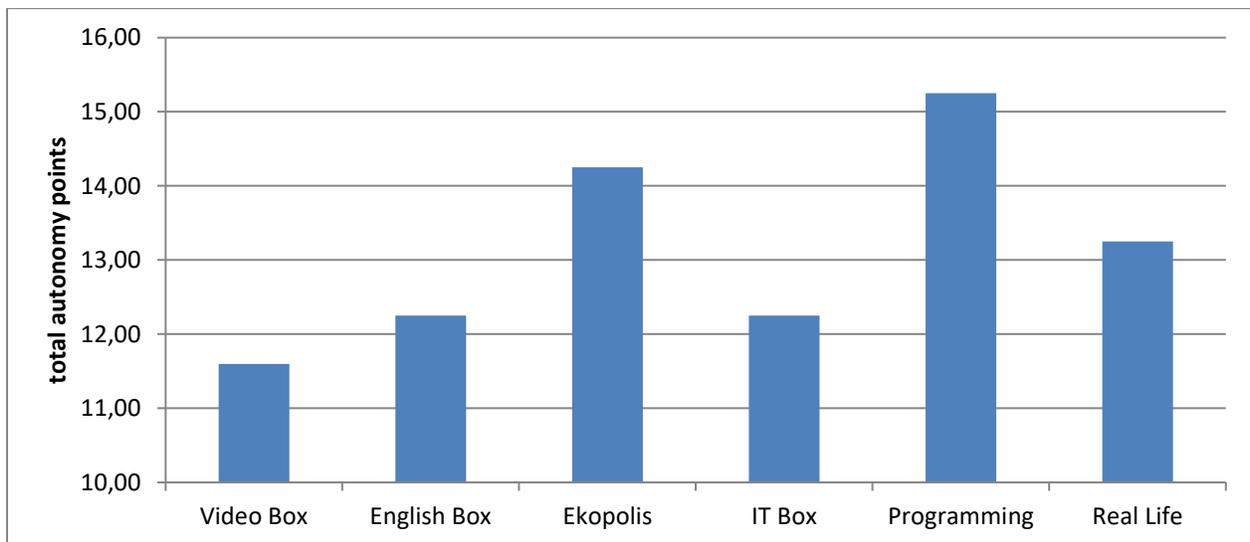
In the first graph, we can see that the box children liked the most was Ekopolis, followed by the Programming box. They also learned most using these particular boxes (as stated by teachers – children’s knowledge was not tested in any way).

We can clearly see that how the children perceived the boxes is related to the level of learner autonomy they displayed. The correlations are as follows:

- the correlation of learner autonomy and how easy the box was  $-0.69$  (i.e. if the tasks in the box were more difficult, the children displayed a higher level of learner autonomy);
- the correlation of learner autonomy and how much the children learned using the box was  $0.59$  (i.e. if the children learned more when using the box, they also displayed a higher level of learner autonomy);
- the correlation of learner autonomy and how much the children liked the box was  $0.78$  (i.e. if they liked the box more, they also displayed a higher level of learner autonomy).



**Graph 3: Results of the accomplishment questionnaire (Slovakia)**



**Graph 4: Learner autonomy score (average values across genders) (Slovakia)**

The graphs clearly show the variations among the boxes are substantial when it comes to the learner autonomy and the enjoyment of the boxes. Unfortunately, the graphs only tell us that it happened, but they do not tell us why. Therefore, a qualitative analysis in the form of an interview with the teachers was needed to clarify these variations (see below).

#### NOTES FROM INTERVIEWS WITH THE TEACHERS

- Teachers said that the drop of learner autonomy seen with the IT Box was mainly due to the nature of the box. They had many technical problems with RaspberryPi, which didn't work as it should have, was very slow and often got stuck, so it was quite frustrating for the kids. Then the kids moved to Scratch and to tasks such as "look up what the EU is", but they were simply not interested in these activities. They did like MaKey MaKey though.

- Some children were able to stick with a task even through obstacles. However, most kids couldn't do this and gave up very soon. Children were constantly encouraged to work on their own, to have patience etc., not only during the project, but during school lessons as well. But when the task didn't make sense to them or wasn't interesting enough, they simply wouldn't do it. Let us remind that most of the children think they are never going to work, so lots of things they are asked to learn simply doesn't make sense to them. However, if they like something, they are indeed able to learn on their own, for example some children learned to play musical instruments on their own and are very good musicians.
- It is important to bear in mind that children's performance and focus may be affected by various issues such as problems at home or the fact they are hungry. Children need to feel safe and have a good self-esteem in order to learn efficiently which is not always the case. Basic needs (food, safety...) and poor self-esteem are definitely issues to be addressed.
- Fortunately, the project did help to raise some children's self-esteem. For example, there was a boy who never worked much. However, one day another boy, who typically did most of the work, was missing, so the boy in question tried a programming task and to his surprise, he found he could do it. From then on, his self-esteem and willingness to engage in activities increased considerably.

## 2. KOSOVO

In Kosovo, the collection of quantitative data turned out to be quite a challenge, mostly due to the nature of the location: the group of children kept changing throughout the project and so did the staff (mostly volunteers) and the environment was much less structured.

Therefore, in Kosovo, fewer questionnaires and more interviews, focus groups and field visits would have been in place. Based on this experience, we recommend always discussing the evaluation approach with the teachers beforehand. If the teachers feel the proposed evaluation plan is not feasible or appropriate, then it should be modified to better reflect the nature of the location.

As a result, in the case of Kosovo, we omitted the quantitative analysis entirely due to having too little data to work with. Instead, we opted for qualitative summary of the project and its benefits. This summary was provided by local teachers.

### **What did the children learn using the boxes?**

Most of the participants of Imaginatorium [note: the place where the project took place] have never had a Smartphone in their hands. Most of them had never used a ruler to draw a straight line or had never been outside of mahalla [note: local neighbourhood] except to visit family members in other mahallas of nearby villages. Most of them had not been offered any logical or fine motor skills development exercises while growing up, and most of the time is spent in the streets under the watchful eye of a family member or a neighbour.

Since the beginning of the Head in the Clouds project, we have constantly had 20 to 30 younger members of the community either engaged in the project or as observers. During the implementation of all the boxes, many children and youth had the opportunity to try or see something for the first time, engage in processes and tasks they couldn't do anywhere else before, while also addressing values and ways to do so in a peaceful, cooperative, sharing and supportive environment.

We cannot say the kids learned specific things intended while working on the tasks. We cannot say they succeeded to follow them through with ease or to include girls in all the activities, but we can say with certainty that in general, the whole group, even the ones not involved in the tasks directly, benefitted from the program greatly. The dynamics of the group changed, impulsive behaviour decreased and the children were more engaged in the tasks at hand.

They benefitted the most in the ability to handle tablets and smart phones. Not just at the Imaginatorium centre, but in the whole mahalla. Phones started to be given out to the kids by the parents, if not personal, then they would share, like the most. Directing them and teaching them some useful daily life things that can be solved or be done using the phone was highly influential.

At the end of the implementation, this version of SOLE method worked perfectly to get the participants interested in the tasks, but not always to keep them learning. For that we needed to provide additional help.

**Did the kids do the tasks completely on their own, or did the grown-ups help them? To what extent? In what way?**

Only a couple of Imaginatorium participants would be able to perform some of the tasks on their own, for the limitations are many. A lack of general knowledge about the world and Kosovo systems, lack in basic (worldly accepted) children experiences, poor reading and writing skills (for more than half non-existent), financial, social and religious limitations leave them at the level where following the task seems like an impossible thing.

We as educators or volunteers who visited needed to assist, translate, read, lead by example, motivate and even push them a bit into some tasks or activities they rejected without even trying. We introduced some of the simple tasks and let the kids do what they felt should be done (like drawing maps in Ecopolis, but the maps were not maps at the end, or did not resemble Gračanica at all). On some occasions we had parents visit and engage in the tasks, especially older men with Makey Makey tasks of which they approve, because they were connected to future job prospects.

**Were there any kids who were not able to do the tasks on their own or who disliked the SOLE approach?**

As mentioned before, many could not do the tasks, and the ones that disliked them did so for a few basic reasons. Either it was too difficult for them, meaning they could not read the task, understand it or envision what they needed to do, or it was not interesting, reminding them of games for children which, even though slightly interested, they still won't engage in because they don't want to be seen as 'a kid' by the peers around them.

Also, free time activities in the mahalla are usually self-initiated versions of cheap and non-productive fun activities in the streets, and with Imaginatorium opening this changed greatly. The Imaginatorium centre, which works every day, and offers various programs to these youth and kids, changed their perspective of how to use their free time. And most of the time, participants have the right to choose what they want to do or leave if they want to. This leads them to do other things and activities Imaginatorium and mahalla offer and these may sometimes be more interesting than what the Head in the Cloud project offers.

However, the Head in the Clouds project, together with other activities and classes during the week, motivated many kids to engage in some type of learning or skill practicing. During a session, one group took speakers to fix, later they engaged in fixing bicycles, movies and movie making.

On the other hand, there were many children who felt that our reserved educational approach was not the right one. They demanded to be assisted, demanded us to draw, read or write instead of them. Most lost patience and interest after reaching the first 'barrier' of the task and many decided to quit the moment they saw the amount of text on the task sheet.

**Did the activities affect children’s performance at regular school or their opinions on school?**

We cannot say this with certainty, because cooperation between NGOs and schools is difficult to achieve, but we had parents coming to report better marks at school (English). As for younger kids (preschool and school beginners), who mostly stood by, watched, were occasionally engaged or were doing something else in the background, we noticed a more responsible attitude towards school and the Imaginorium centre develop over time. Most of them know more about language and maths than their siblings did at their age (and some of them even now).

**Could the SOLE approach, in your opinion, completely replace “normal” school education?**

Taking in consideration the current education system, we doubt there will be enough pressure and efforts to incorporate this method, but we believe that, amongst other good practices, it should be introduced as an option. As an organisation, we believe in strong impacts of diverse and numerous approaches and methods. Therefore, we see SOLE as one of the models, for some children the best one, and for others not so effective.

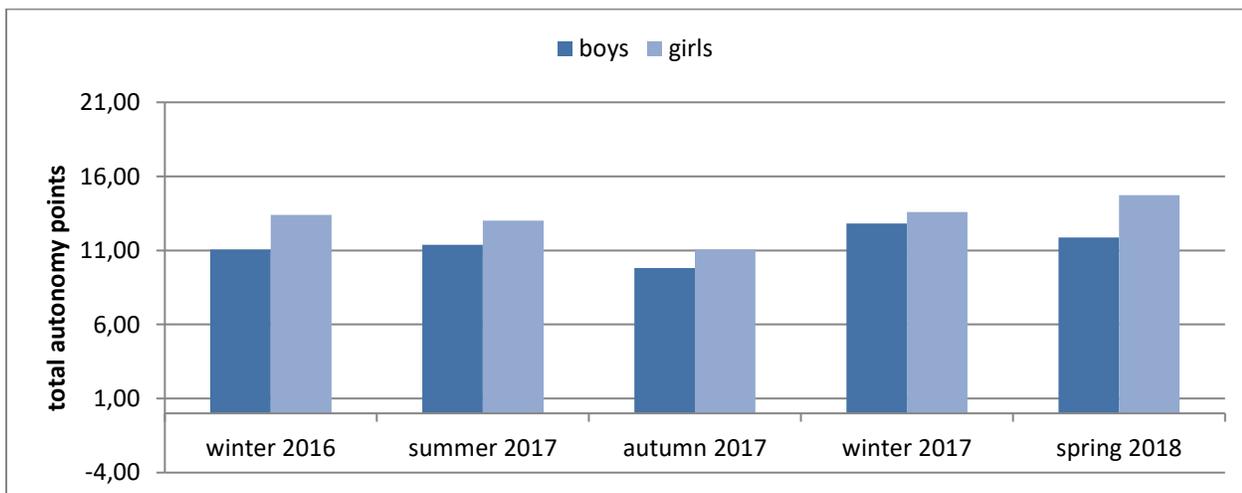
### 3. ROMANIA

In Romania, we have data for about 31 children (16 boys and 15 girls). We received the learner autonomy questionnaire five times throughout the project and, unlike in Slovakia, it wasn't always necessarily clearly linked to one of the boxes. We also received four accomplishment questionnaires and six personality questionnaires.

Compared to Slovakia, it is therefore more difficult to link these questionnaires together and come up with clear conclusions.

#### LEARNER AUTONOMY BY GENDER

The graph below shows total autonomy points (on a scale from 0 to 21) at different times of the project, namely average scores for boys and for girls. Just like in Slovakia, we can see that there is no steady increase. The level of learner autonomy seems to fluctuate. We can assume that similarly to Slovakia, the extent to which the children were able to learn autonomously was affected by the particular task or tasks during which the observations took place. Nevertheless, an interesting fact is that girls consistently showed a higher level of learner autonomy compared to boys.



**Graph 5: Average learner autonomy score by gender (Romania)**

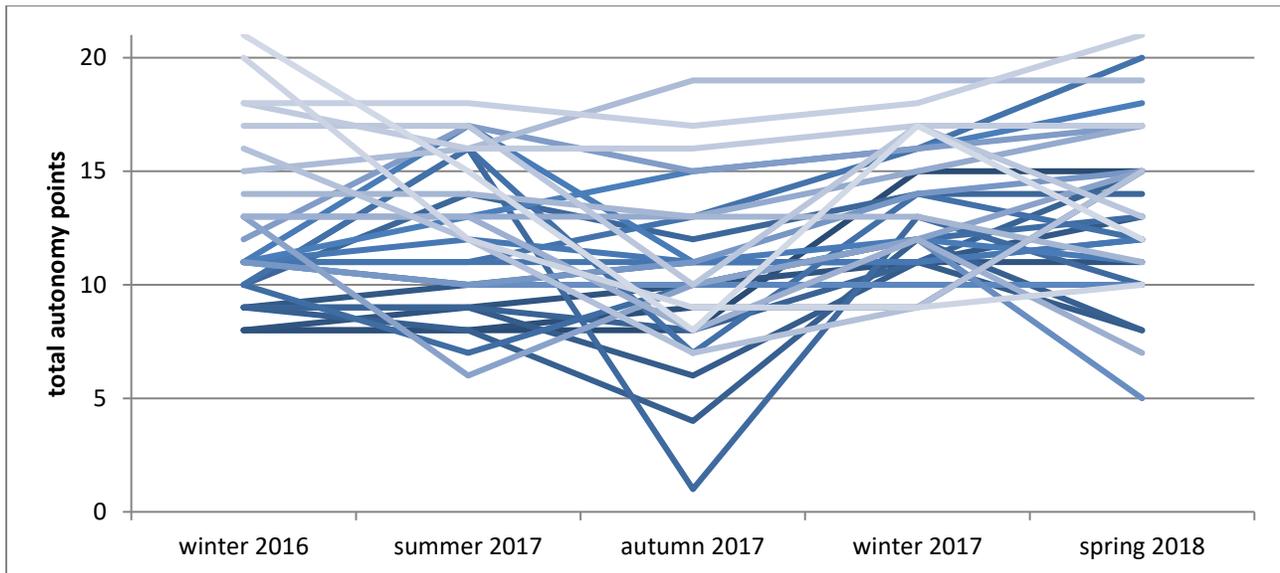
#### INDIVIDUAL LEARNER AUTONOMY DEVELOPMENT

The graph below shows the development of learner autonomy for each of the Romanian children. The development is similar to Slovakia: rather than growing steadily, the learner autonomy fluctuates.

The average increase between the first and the last observation was 1 point, which may be attributed to either a "true" increase in the ability to learn, or to the nature of the tasks undertaken during the measurement.

For the children with low starting levels of learner autonomy (below 10 points, which applies to seven children), the average increase was 3.5 points.

In other words, those who worked quite well already at the beginning of the project did not seem to improve so much in terms of learning autonomy, but those who were at risk of being left behind did in many cases improve quite considerably and were able to catch up with the rest of the group. We may therefore assume the project might lead to greater equity and equality.



**Graph 6: Individual learner autonomy scores (Romania)**

### **LEARNER AUTONOMY BY DOMAIN**

The table below shows the average score (across genders) in each of the learner autonomy domains, which are as follows.

1. the ability to set meaningful and achievable goals
2. the ability to find ways to reach a goal
3. the ability to identify a source of failure
4. the ability to learn from one's mistakes
5. the ability to see mistakes as an opportunity for improvement
6. the ability to work independently towards reaching a goal
7. the ability to evaluate if a goal has been reached

The highest possible score in each domain is 3.

We can see that the scores across domains are roughly comparable. Interestingly, just like in the case of Slovakia, the lowest average score was obtained in the sixth domain – the ability to work independently towards reaching a goal.

Box	Domain						
	1	2	3	4	5	6	7
winter 2016	1,94	2,16	1,77	1,74	1,61	1,42	1,55
summer 2017	1,84	2,23	1,84	1,81	1,48	1,48	1,48
autumn 2017	1,84	1,61	1,39	1,19	1,87	1,19	1,32
winter 2017	1,84	2,06	1,97	1,74	1,81	1,77	2,00
spring 2018	1,84	1,61	1,71	1,97	2,29	1,90	1,94
mean	1,86	1,94	1,74	1,69	1,81	1,55	1,66

**Table 11: Average learner autonomy score by domain (Romania)**

### LEARNER AUTONOMY AND PERSONALITY TRAITS

The table below shows the correlation matrix between different personality aspects and learner autonomy. The personality aspects were as follows:

- preference of individual work vs. preference of group work (the higher the score, the stronger the preference towards group work);
- systematic vs. spontaneous approach (the higher the score, the stronger the preference towards spontaneity);
- the desire to “just play” vs. the desire to win (the higher the score, the stronger the inclination towards the desire to win);
- preference of acting (i.e. “doing something”) vs. preference of thinking (the higher the score, the stronger the inclination towards thinking).

The correlations of these traits with the total learner autonomy score are in the first column. To calculate these correlations, we only used data that we obtained at roughly the same time (sometimes, we obtained a personality questionnaire way sooner than the autonomy questionnaire, so we assumed they were based on observations at a different time and should not be correlated).

In Romania, the correlations are weaker compared to Slovakia.

	<i>Learner autonomy</i>	<i>Preference of group-work</i>	<i>Spontaneity</i>	<i>Inclination to "winning"</i>	<i>Inclination to "thinking"</i>
<i>Learner autonomy</i>	1				
<i>Preference of group-work</i>	-0.07	1			
<i>Spontaneity</i>	-0.27	0.23	1		
<i>Inclination to "winning"</i>	0.26	-0.18	-0.44	1	
<i>Inclination to "thinking"</i>	0.13	0.02	-0.16	0.22	1

**Table 12: Correlation of learner autonomy and personality traits (Romania)**

The comparison of learner autonomy with the results of accomplishment questionnaires are not included as we do not have consistent data like from Slovakia (in Romania, these questionnaires were often sent at different times).

**NOTES FROM INTERVIEWS WITH THE TEACHERS**

- Similarly to Slovakia, there were issues with RaspberryPi, so children did only very few tasks.
- Their performance and focus fluctuated for various reason. Children are very moody. Something might have happened in the family or there might have been a fight among boys or a child might have had a bad experience at school and did not join the project in the afternoon, for example.
- The project helped with the behaviour of the kids. They went from groupwork to individual work. They asked for tasks. Girls would come and ask for tasks which they then worked on individually. They learned to use tablets, make movies, videos, photos, slow motion, download game, search in English etc. When there was a problem with MaKey MaKey just before a public event, children were able to solve it themselves. They were also able to solve problems with RaspberryPi. Since teachers couldn't solve the problem too, children simply had to find a way themselves.

## V. CONCLUSIONS (PRELIMINARY)

- In the course of the project, we couldn't conclusively prove that our approach increases the level of learner autonomy, nor could we find a clear, consistent link to personality traits. However, we have quite a lot of evidence that supports the fact that learner autonomy is directly related to the task that is being undertaken, i.e. the same child may display high levels of learner autonomy if they like the task (how engaging and how challenging, box design etc.) at hand and feel they are learning something new.
- The evaluation revealed that out of the 7 domains, that were defined in the concept of learner autonomy, the most difficult one was the ability to work independently towards reaching a goal. This was discussed later on with our implementing partners, who confirmed that this is most likely due to the lack of self-confidence and self-esteem, which is rooted in the social and cultural particularities of the target group and becomes negatively reinforced by the formal educational system. Addressing these lacks might be a promising way towards overcoming hurdles in education.
- To foster the highest learning it is necessary to create a safe-space in which children and youth do not fear consequences, in form of negative reaction from their peers and in which they can try out new behaviour, that varies from established standard behavioural patterns and rules.
- The data further indicated that the degree of difficulty is positively correlated with the subjective degree of enjoyment and learning, although one might expect the contrary, i.e. children prefer easier tasks. However, it is common knowledge in pedagogy that children enjoy being challenged and in consequence of this joy achieve better learning results, which is reflected in our data also for this specific target group.

## VI. REMARKS AND FURTHER SUGGESTIONS

- We recommend involving all partners of an evaluation strategy and the definition of the evaluation aims and research questions. By doing this you ensure that the needs of all partners are met and their active representation and that, they will participate actively as they experience and see clearly the added value of the evaluation process. If the evaluation techniques are too complicated or too time-consuming, they are not likely to be effective. We strongly recommend sticking to simple and easily measurable concepts (for example, keeping the learner autonomy concept simple and straightforward) and using simple measurement tools (short questionnaires etc.).
- If possible, we recommend using Excel sheet questionnaires (learner autonomy, personality, accomplishment), ideally after each box is finished. If not possible, qualitative evaluation might be an option. These sheets may help capturing children's progress in learner autonomy and their opinion of

the boxes. As for QR codes, we recommend ensuring that using them is possible (the locations might not have stable internet connection). If not, we recommend looking for other options to track children's activities.

- In challenging environments with limited internet access, we recommend putting less emphasis on quantitative evaluation and instead incorporating qualitative evaluation techniques such field visits, skype interviews etc. Due to the nature of the locations, this may paint a much more comprehensive picture of the benefits and drawbacks of the project while also being more accessible and comfortable for teachers and students.

Additional evaluation ideas for future implementations:

- **Structured interviews**

The goal is to get in-depth information about everything related to students' interaction with the boxes. This can offer invaluable insights into how the SOLE method works in practice. To conduct these interviews, it is necessary to have a list of questions and arrange regular skype or face-to-face sessions with the teachers.

- **Demographics questionnaire**

Additionally to basic demographic information (name, age, gender), it might be useful to collect information on the number of siblings, mother tongue and history of formal learning of the children or any further data that might be obtainable. This could be then linked to the learner autonomy as well.

- **Hobbies evaluation**

It might be useful to find out if working with the boxes has an impact on students' hobbies and interests. For this purpose, the hobbies evaluation should be done at the beginning and at the end of the project. Students should be told to draw a picture of a "FUN LAND" – a land where they can do any activities they enjoy. They should be told to imagine they can spend a week in this land – what things would they like to have there? This way, it is possible to see if they include different things at the end of the project compared to the beginning. Of course, this wouldn't necessarily mean their hobbies changed due to the project – the change might also reflect natural development.

- **Free time evaluation**

The goal is to get some information about the students' lifestyle and about the amount of free time they have, as the amount of unstructured free time may affect a child's learning outcomes. The children could be given a camera for a day or two. They will certainly take lots of pictures, and as the camera stores the time when pictures are taken, these pictures will show what a typical day of the students looks like.

## VII. SOURCES

- Benson, P. & Voller, P. (1997). *Autonomy and Independence in Language Learning*. London: Longman.
- Dam, L. & Gabrielsen, G. (1996). The acquisition of vocabulary in an autonomous learning environment – the first months of beginning English. In R. Pemberton, E.S.L. Li, W.W.F Or & H.D.Pierson (Eds.) *Taking control: Autonomy in language learning*, Hong Kong University Press, 265-280.
- Dornyei, Z. (1998). *Motivation in Second and Foreign Language Learning*.
- Gardner, R. C. and MacIntyre, P. D. (1993). A Student's Contributions to Second-language Learning. Part II: Affective variables. *Language Teaching* 26, 1-11.
- Omaggio, A. (1978). 'Successful language learners: What do we know about them?', ERIC / CLL News Bulletin, May, 2-3.
- Palfreyman, D. & Smith, R. (Eds.) (2003). *Learner autonomy across cultures: language education perspectives*. Hampshire, UK: Palgrave Macmillan Ltd.
- Phillips, J. M., & Gully, S. M. (1997). Role of goal orientation, ability, need for achievement, and locus of control in the self-efficacy and goal--setting process. *Journal Of Applied Psychology*, 82(5), 792-802. <http://doi.org/10.1037/0021-9010.82.5.792>
- Simmons, B. (1996). A study of strategy use in independent learners. In R. Pemberton, E.S.L. Li, W.W.F Or & H.D. Pierson (Eds.). *Taking control: Autonomy in language learning*. Hong Kong: Hong Kong University Press.
- Strauss, A.L. & Corbin, J. (1998). *Basics of qualitative research : techniques and procedures for developing grounded theory*. Thousand Oaks, California: Sage Publications
- Tarone, E. and Yule, G. (1989). *Focus on the Language Learner*. Oxford: OUP.
- Vygotsky, L. (1978). Interaction between learning and development: Readings of development of children [Online], 79-91. Retrieved from <http://www.psy.cmu.edu/~siegler/vygotsky78.pdf>
- Zhang, Y. (2014). An experiment on the development of learner autonomy through learner training [Online]. Retrieved from [http://en.cnki.com.cn/Article\\_en/CJFDTotal-WYJY200401009.htm](http://en.cnki.com.cn/Article_en/CJFDTotal-WYJY200401009.htm)