ICTs for Education: An Inclusive Approach to Addressing Challenges Faced by Roma Communities in Europe

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https://brainsintheclouds.eu
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Verein Offenes Lernen (Austria)
http://o-le.org

www.scio.cz SRO (Czech Republic)
www.scio.cz

Gaia (Kosovo)
gaiakosovo.wordpress.com

Fundatia Crestina Diakonia Filiala Sfantu Gheorghe (Romania)
www.diakonia.ro

Sukromna zakladna skola (Slovakia)
www.szsgalakticka.edupage.org
1. INTRODUCTION & BACKGROUND
Goals

- Design a program with the aim to provide an alternative access to education for children and youth from Roma families to reduce the high school-drop out rate.
- Increase basic and transversal skills, especially digital literacy.
- Preventing that educational disadvantages and exclusion are later manifested in an exclusion from society in general and specifically from the labor market.
Background

- Roma people represent Europe’s largest ethnic minority
  - Approx. 10-12 million people live in Europe

- Reality: severe poverty, profound social exclusion, discrimination
  - bad access to quality education, employment, income prospects
  - bad housing conditions and health status

- 89% of Roma leave school early
  - PISA tests: 80-95% of Romani-speaking students have not acquired basic cognitive skills and competencies

  limited possibilities to find qualified employment

  problems to cope with the complex demands of today’s societies
Reasons for Early school leaving of Roma

• Inappropriate teaching styles and curricula

• Socio-economic reasons
  • poor infrastructure, lack of available public transport, shortages of equipment, geographical distance to schools

• Cultural and individual reasons
  • language and communication problems, insufficient understanding of learning materials, low confidence in schools, early marriage and childbirth, necessity of contributing to household income
2. PEDAGOGICAL APPROACH
Pedagogical approach

Sugata Mitra: Self-Organised Learning Environments (SOLE)

- Project-based learning
- Student-centred
- Creativity
- Hands-on activities

Constructionism

- Experiential Learning
- Mentors („grannies“)
- Collaborative
- Self-driven learning process (curiosity)
Pedagogical Approach

**MINIMAX approach**
aiming at minimal teacher invasion and maximum learner autonomy

- Inspired by SOLE, Constructionism and Makers Movement
- A maximum of “hands-on” activities
- A minimum of theory
- Self-explanatory materials (modular structure, simple and easily understandable tasks, videos, little text, for groups or individual)
- Independence from teachers <-> self-driven learning
- Teamwork, collaboration, personality building, safety, trust, self-worthiness, autonomy
- Topics which are not covered sufficiently in traditional school setting, based on previous need assessment
3. LEARNING MODULES
Learning Modules

All materials are available as Open Educational Resources: [https://brainsintheclouds.eu/](https://brainsintheclouds.eu/)
## Learning Modules

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Title</th>
<th>Content</th>
</tr>
</thead>
</table>
| 1   | Video | + handle a mobile device, tablet, smartphone  
+ work with QR-codes, online apps  
+ search for information on the Internet  
+ make a video / short film (storybook writing, taking and editing of pictures, interviews…)  
+ give and receive feedback |
| 2   | IT 101| + how to assemble a Raspberry Pi computer  
+ use (Open) Office Programs (text processing, email clients)  
+ Online services (Google, Google Maps, Wikipedia, YouTube)  
+ elementary level computer programing skills using Scratch |
| 3   | English | + basics of English (vocabulary, building sentences, spelling, pronunciation, tongue twisters, family trees, describe a friend, recording audio messages etc.)  
+ communicate with other participating students  
+ retrieve information online (e.g. how many people speak English and in which countries?) |
# Learning Modules

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Title</th>
<th>Content</th>
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</thead>
</table>
| 4   | **Ekopolis**      | + educational board game addressing environmental issues in a playful manner  
|     |                   | + pollution, environment, sustainability, waste reduction, recycling, ecological footprint  
|     |                   | + raise awareness for the impact of human actions and stimulates discussions  
|     |                   | + get to know their hometowns (e.g. draw a map etc.)                                                                                  |
| 5   | **Programming**   | + hands-on programming and engineering activities using different tools and software (Makey Makey boards, Scratch, Ozobot robots, Lego WeDo, Minecraft, Python) |
| 6   | **The Real World**| + how to repair things, going on a trip  
|     |                   | + personal hygiene (bacteria and viruses, doctors, physical activity, vitamins, water drinking, drugs, first aid basics)  
|     |                   | + relationships (different levels of relationship, friendly and unfriendly behavior, bullying)  
|     |                   | + Roma culture (history, traditions, role models, language...).                                                                       |
Structure of Learning Modules

- Easily implemented
- Group and individual settings
- Teacher-manual
- Task sheets
  - Very simple
  - Modular structure
  - As little text as possible
- Online hand-in tool
- Evaluation
“Hand-it-in-App”: Website

Your own map!

Draw your own maps! How big can it be? Don’t forget to upload a picture of it.

Upload your picture:

select/take a picture

reflection / message:

Done? How did it go?
### “Hand-it-in-App”: Evaluation Data

**CloudLearning_Ecop_ko**

<table>
<thead>
<tr>
<th>Id</th>
<th>competency</th>
<th>Student1</th>
<th>Student2</th>
<th>Student3</th>
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<th>Student10</th>
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</thead>
<tbody>
<tr>
<td>1.1</td>
<td>A Be open to new and worthwhile ideas (both incremental and radical concepts)</td>
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<td>1.3</td>
<td>K Know a wide range of idea creation techniques (such as Brainstorming)</td>
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<td>1.5</td>
<td>A Create new and worthwhile ideas (both incremental and radical concepts)</td>
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<tr>
<td>2.1</td>
<td>A View failure as an opportunity to learn – understand that creativity and innovation is a long term, cyclical process</td>
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<td>2.2</td>
<td>A Consider and evaluate major alternative points of view</td>
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<td>2.4</td>
<td>A Be open to non-familiar, unconventional and innovative solutions to problems and to ways to solve problems</td>
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<tr>
<td>2.5</td>
<td>A Ask significant questions that clarify various points of view and lead to better solutions</td>
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<tr>
<td>2.6</td>
<td>A Ask meaningful questions that clarify various points of view and lead to better solutions</td>
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<td>2.8</td>
<td>S Explain, stating results, justifying procedures and presenting arguments.</td>
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<td>3.2</td>
<td>S Ability to concentrate for extended as well as short periods of time.</td>
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<td>3.4</td>
<td>S Ability to communicate as part of the learning process by using appropriate means (intonation, gesture, mimicry, etc.)</td>
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<td>4.3</td>
<td>S Ability to read and understand different texts, adopting strategies appropriate to various contexts and audiences</td>
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<td>4.4</td>
<td>K Sound knowledge of basic vocabulary, functional grammar and style, functions of</td>
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<td>4.5</td>
<td>K Know when it is appropriate to listen and when to speak. Work effectively in diverse</td>
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<tr>
<td>5.1</td>
<td>S Speak with clarity and awareness of audience and purpose: Listen with care, patience</td>
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<tr>
<td>5.6</td>
<td>A Act responsibly with the interests of the larger community in mind</td>
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<tr>
<td>6.2</td>
<td>A Properly to use information to work autonomously and in teams - critical and relevant</td>
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<td>6.7</td>
<td>S Use technology as a tool to research, organise, evaluate and communicate inform</td>
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<tr>
<td>6.8</td>
<td>S Use digital technologies (computers, PDAs, media players, GPS, etc.), communicati</td>
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<td>9.1</td>
<td>A Monitor, define, prioritize and complete tasks without direct oversight.</td>
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</tbody>
</table>

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**BOX: 5_Ecopolis - TASK: Sc1.5.4 - Advantages & Disadvantages**

- On my way to school
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
  - Student6
  - Student7
  - Student8
  - Student9
  - Student10
  - Student11
  - Student12
  - Student13
  - Student14
  - Student15
  - Student16

**BOX: 5_Ecopolis - TASK: Sc1.1 - Brainstorming - On my way to school**

- On my way to school
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
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**BOX: 5_Ecopolis - TASK: Sc1.2 - Brainstorming - On my way to school**

- On my way to school
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
  - Student6
  - Student7
  - Student8
  - Student9
  - Student10
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  - Student13
  - Student14
  - Student15
  - Student16

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**BOX: 5_Ecopolis - TASK: Sc1.3 - Brainstorming - On my way to school**

- On my way to school
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
  - Student6
  - Student7
  - Student8
  - Student9
  - Student10
  - Student11
  - Student12
  - Student13
  - Student14
  - Student15
  - Student16

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**BOX: 5_Ecopolis - TASK: Sc2.1 - Map - My way to school**

- My way to school
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
  - Student6
  - Student7
  - Student8
  - Student9
  - Student10
  - Student11
  - Student12
  - Student13
  - Student14
  - Student15
  - Student16

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**BOX: 5_Ecopolis - TASK: Sc3.2 - People Work - Worksheet**

- People Work - Worksheet
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
  - Student6
  - Student7
  - Student8
  - Student9
  - Student10
  - Student11
  - Student12
  - Student13
  - Student14
  - Student15
  - Student16

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**BOX: 5_Ecopolis - TASK: Sc3.4.2 - The super jobs - Worksheet**

- The super jobs - Worksheet
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
  - Student6
  - Student7
  - Student8
  - Student9
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  - Student14
  - Student15
  - Student16

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**BOX: 5_Ecopolis - TASK: Sc3.6.1 - Work - Worksheet**

- Work - Worksheet
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
  - Student6
  - Student7
  - Student8
  - Student9
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  - Student11
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  - Student14
  - Student15
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**BOX: 5_Ecopolis - TASK: Sc3.7.2 - What Will I Be When I Grow Up - Worksheet**

- What Will I Be When I Grow Up - Worksheet
  - Student1
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  - Student4
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  - Student7
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  - Student13
  - Student14
  - Student15
  - Student16

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**BOX: 5_Ecopolis - TASK: Sc3.8.2 - Kitty's Dream Job - Worksheet**

- Kitty's Dream Job - Worksheet
  - Student1
  - Student2
  - Student3
  - Student4
  - Student5
  - Student6
  - Student7
  - Student8
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  - Student11
  - Student12
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  - Student15
  - Student16

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**BOX: 5_Ecopolis - TASK: Sc3.9.1 - My dream job**

- My dream job
  - Student1
  - Student2
  - Student3
  - Student4
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  - Student11
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  - Student14
  - Student15
  - Student16

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**BOX: 5_Ecopolis - TASK: Sc3.1 - Green, Blue and Red buildings in my ho**

- Green, Blue and Red buildings in my ho
  - Student1
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  - Student15
  - Student16
4. IMPLEMENTATION
# Learning Modules

<table>
<thead>
<tr>
<th>Module Nr.</th>
<th>Content</th>
<th>Lead</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Video</td>
<td>TUK, OLE</td>
<td>Oct. – Nov. 2016</td>
</tr>
<tr>
<td>3</td>
<td>English</td>
<td>TUK, OLE</td>
<td>Feb.-March 2017</td>
</tr>
<tr>
<td>4</td>
<td>Ekopolis</td>
<td>TUW</td>
<td>April-June 2017</td>
</tr>
<tr>
<td>5</td>
<td>Programming</td>
<td>TUW, OLE</td>
<td>Sept. – Oct. 2017</td>
</tr>
<tr>
<td>6</td>
<td>The Real World</td>
<td>TUK, OLE</td>
<td>Nov. 2017- Jan. 2018</td>
</tr>
</tbody>
</table>
Implementation of SOLE-Boxes

- 3 different locations
  - Romania: Afternoon care program, about 30 kids (6-11 years old)
  - Kosovo: Community center for kids and teens, about 5-30 kids (10-17 years old)
  - Slovakia: School, about 20 kids (12-14 years old)

- Implementation time: 6-8 weeks per box and location
- Materials and boxes are provided
- At the beginning of each box, guidance session for teachers
- Regular skype-sessions throughout the implementation
- Regular progress evaluation
5. EVALUATION & RESULTS
# Evaluation of Learning Modules

**Focus:** **LEARNER AUTONOMY** (children’s ability to learn on their own)

<table>
<thead>
<tr>
<th>Quantitative data</th>
<th>Qualitative data</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 3 Questionnaires</td>
<td>+ Live observations</td>
</tr>
<tr>
<td>- Learner autonomy</td>
<td>+ Interviews with children, youth and mentors</td>
</tr>
<tr>
<td>- Performance (tasks)</td>
<td>+ Written reports</td>
</tr>
<tr>
<td>- Personality</td>
<td>+ Basic demographic data (age, gender, ...) collected as part of needs assessment</td>
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<tr>
<td>+ Data from the „Hand-it-in App“</td>
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</tbody>
</table>

(1) Did the level of learner autonomy improve in the course of the project?
(2) Is the level of learner autonomy correlated with certain personality traits?
(3) Is the level of learner autonomy related to the activity undertaken?
Definition of Learner Autonomy

The ability to …

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

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Overall Evaluation Results

- **MINIMAX** supported by digital materials and tools, proved to fit the needs of the participants better and led to a higher motivation for learning
  - Children became interested in learning again
    (Slovakia: children that hardly participated in school classes stayed in the afternoon to participate in the program and showed excitement and pride when finishing a task)
  - High attendance rates (From 100 Roma students, only one student withdrew from the HiC program)
  - Better performance in school (English, Mathematics, Geography and Biology)
  - Reading and writing skills improved across all locations
  - Kids learned how to handle devices such as computers and tablets

- Behavior and social skills and interaction of the participating children greatly improved
  - Romania: kids went from group work to individual work
  - Slovakia: Girls would often come and ask for more tasks
  - Independence in engagement rose drastically
  - Fear of failure was also observed to demolish for some of the kids
  - Gender inequality was addressed at a large scale
  - Students learned to cooperate, communicate and showed increased ambition (wanted to stay longer)
  - Children increased ability to coordinate, facilitate and analyze their own learning process
  - Changes in children’s attitude towards initiative taking
    (e.g. previously silent observers started to take initiative, individuals with leadership spirit grew and engaged even more)
Further results and lessons learned

- Educators
  - Mind shift in the work of the educators could be observed (inclusion of non-formal education techniques)
  - Digital competences of educators were raised
  - New understanding of basic obstacles for learning such as security and safety as a prerequisite

- “Hands-on“ activities, involving all senses work best

- Common challenges: long texts, basic concepts (e.g. world map, role models)

- To convey specific educational contents a minimal degree of intervention and guidance by mentors appears to be indispensable

- Although the content of the educational modules is identical – very different ways of implementing the boxes in different locations

MINIMAX as possible extension/supplement to conventional teaching curricula, enabling students to acquire new learning contents in a playful and self-explanatory manner, driven by curiosity and the desire for knowledge.

MINIMAX offers a way back to education for children and young adults who have already dropped-out of school.
6. LONG TERM IMPACT
Long Term Impact & SDGs

SDG 1: No Poverty
- Knowledge, Competences, and Skills
- Transversal Skills
- Personal Empowerment

SDG 2: Zero Hunger
- Food Access

SDG 3: Good Health & Well-being
- Healthy Lifestyle

SDG 4: Quality Education
- Inclusive Learning Environments
- ICTs
- Regular Attendance

SDG 5: Gender Equality

SDG 6: Clean Water & Sanitation
- Access to Information

SDG 7: Affordable & Clean Energy
- Digital Literacy

SDG 8: Decent Work & Economic Growth
- Poverty Alleviation
- Higher Employment Rates

SDG 9: Industry, Innovation & Infrastructure
- Program

SDG 10: Reduced Inequalities

SDG 11: Sustainable Cities & Communities

SDG 12: Responsible Consumption & Production

SDG 13: Climate Action
- Program

SDG 14: Life Below Water

SDG 15: Life on Land
- Personal Empowerment

SDG 16: Peace & Justice
- SDG 18: Partnerships for the Goals

SDG 19:en: Peace & Justice
- Personal Empowerment

SDG 20: No Poverty
- Knowledge, Competences, and Skills
- Transversal Skills
- Personal Empowerment
7. CONCLUSION
Conclusion

**HEAD IN THE CLOUDS PROJECT**

- **Innovative learning approach: MINIMAX**
  (Self-organized, engaging, collaborative, hands-on, facilitated by adult encouragement)

- **State of the art IT-devices**
  (Tablets, Raspberry Pis, Makey Makey, Ozobots, Minecraft, Scratch and Lego WeDo, Python)

- **Modular structured educational modules**
  (Video, IT 101, English, Programming, Ekopolis and Real Life)

- Access to quality education for marginalized communities
- Increasing digital literacy
- Acquiring knowledge in various domains
- Development of transversal skills and competences
  (negotiation, problem solving, presentation, intercultural skills, collaboration)
- Personal development
  (self-confidence, independence and initiative taking)
- Mind shift of educators and youth workers

**Incorporation of sustainability principles at the core of the curriculum to improve social and economic conditions in the long-term**
All educational modules, handbooks and the documentary are available on the project website

https://brainsintheclouds.eu

Thank you for your attention!

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References


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References


