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[[Erasmus+ Project 2023-1-NL01-KA210-SCH-000157821 Digital data-dRiven EduCaTion fOR kids](#)]



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Promoting **Digital Data Literacy** in **Primary Education**: First Lessons from the DIRECTORS Project

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Introduction | Digital Data Literacy

Data literacy:

the ability to understand, find, collect, interpret, visualize, and support arguments using quantitative and qualitative data



- ✦ in today's digital landscape, developing digital and data skills is essential
- ✦ still underrepresented in early education
- ✦ a need to investigate and develop effective teaching models for data literacy that are appropriate for the age and cognitive development of young learners



Introduction | Digital Data Literacy | DIRECTORS (Digital data-driven EduCaTion fOR kidS)

Erasmus+ project **DIRECTORS**

(Digital data-Riven EduCaTion for kidS)

- ✦ promoting data literacy in primary education (pupils aged 8–10) through new teaching methods and resources
- ✦ workshops conducted in Croatia and the Netherlands --> enabling cross-country comparison

In this presentation...

--> workshop design, implementation, evaluation results, and lessons learned





Methodology, Design, and Implementation

Three-Level Data Literacy Workshops in Croatia & the Netherlands

General Structure > Three workshops:

Basic data skills

*Data in Our Hands
(and Mobile Devices)*



Moderate data skills

*Geospatial Data
(and Maps) in Our Hands*



Advanced data skills

Data sources



Each workshop:

- + 2 sessions (2 x 45–60 min)
- + offline (manual) + online (digital) learning
- + interactive, hands-on, age-appropriate methods
- + full data cycle: collection → processing → analysis → visualization → critical thinking

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Full data cycle:



young children
ISCED level 1



DATA COLLECTION

*by children from the
real-world environment*



DATA PROCESSING

*"children-readable form",
checked for possible errors,
and cleaned if necessary*

DATA ANALYSIS

*ask questions,
extract insights
from data*



DATA VISUALISATION

*depict data in a clear manner,
encourage spatial thinking*



CRITICAL THINKING

*draw **CONCLUSIONS**
from the data and
about the data*



Methodology, Design, and Implementation

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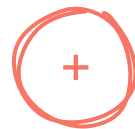
Data sources



Implementation Contexts:

+ Croatia:
53 pupils (ages 8–10; grades 2–4)

+ Netherlands:
44 pupils (Group 7; age 10)



+ Croatia:
61 pupils (ages 8–10; grades 2–4)

+ Netherlands:
90 pupils (Group 7; age 10)



Methodology, Design, and Implementation

Three-Level Data Literacy Workshops in Croatia & the Netherlands

Workshop 1: Basic data skills

Data in Our Hands (and Mobile Devices)

Session 1: Mobile device usage data

- ✦ pupils estimate daily app usage
- ✦ classify & compare data using data cards
- ✦ word cloud: raw vs. cleaned data (spelling/formatting)

Session 2: Collecting and analysing mobile device usage data

- ✦ pupils collect actual usage data
- ✦ enter into spreadsheet; compare estimates vs. reality
- ✦ discussions on data quality, privacy, and anonymization



Methodology, Design, and Implementation

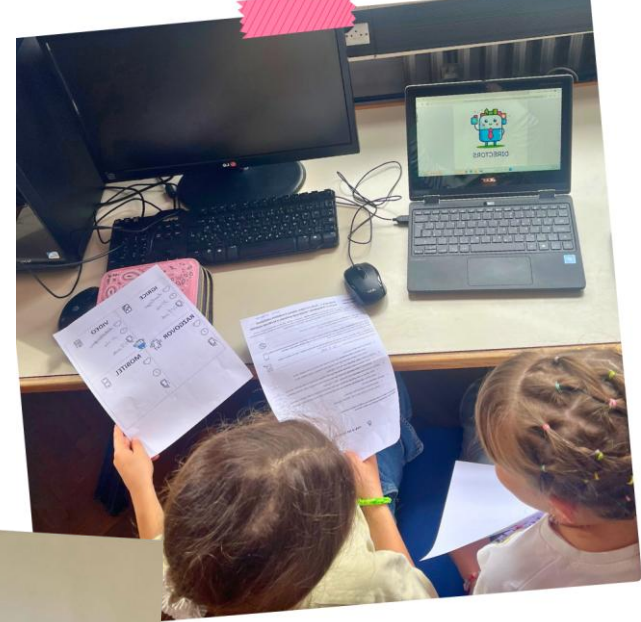
Three-Level Data Literacy Workshops in Croatia & the Netherlands

Workshop 1: Basic data skills

Data in Our Hands (and Mobile Devices)

Methods:

- + real-life, tangible data = high engagement
- + visualization: tables, charts, word clouds
- + combination of individual and group work





Methodology, Design, and Implementation

Three-Level Data Literacy Workshops in Croatia & the Netherlands

Workshop 2: Moderate data skills

Geospatial Data (and Maps) in Our Hands

Session 1: Smart Maps in action: trace, overlay and discover!

- + pupils create map layers using transparent sheets
- + learn GIS and cartographic principles:
georeferencing, vectorization, map symbology

Session 2: Escape (Class)Room – The Mystery of the Missing Teacher

- + digital GIS activity: Escape Room – The Missing Principal
- + use digital maps & spatial analysis to solve mystery



Methodology, Design, and Implementation

Three-Level Data Literacy Workshops in Croatia & the Netherlands

Workshop 2: Moderate data skills

Geospatial Data (and Maps) in Our Hands

Methods:

- ✦ team-based problem solving
- ✦ from analogue to digital maps
- ✦ strong real-world relevance (school environment)





Methodology, Design, and Implementation

Three-Level Data Literacy Workshops in Croatia & the Netherlands

Workshop 3: Advanced data skills

Data sources

Session 1: From our bodies to sensor technologies

- + measure distance with body (steps) vs. technology (apps, wearables)
- + discuss sensor accuracy, method comparison

Session 2: Technology to the rescue! Or not?

- + GPS/GPX tracking using phones and watches
- + visualise tracks in Google Maps
- + evaluate impact of device placement on results



Methodology, Design, and Implementation

Three-Level Data Literacy Workshops in Croatia & the Netherlands

Workshop 3: Advanced data skills

Data sources

Methods:

- ✦ mixed methods: analog vs. digital
- ✦ critical thinking on data accuracy & limitations of tech





Results | General findings

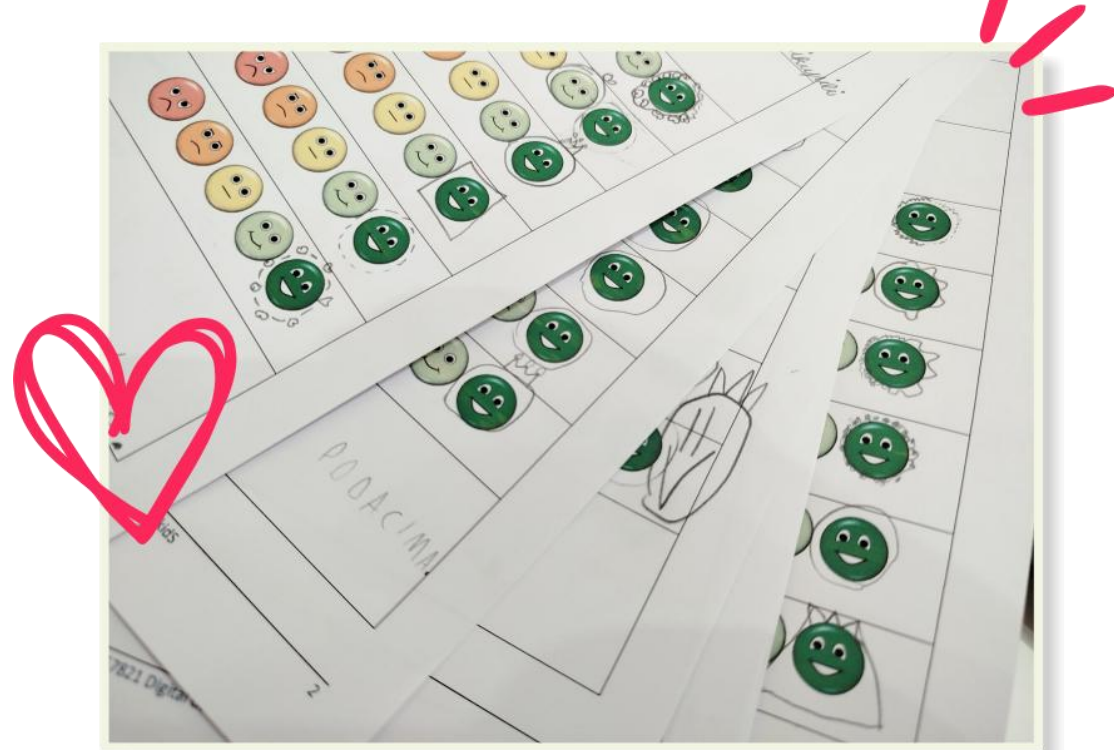
- ✦ overall, workshop outcomes were positive
- ✦ pupils enjoyed active learning, discovering new things, and open discussions
- ✦ minor differences noted between Croatian and Dutch implementations



Results | General findings

Pupil and teacher evaluation

- ✦ surveys conducted after each session using smiley-based scale (1–5)
- ✦ pupils reported high engagement and satisfaction
- ✦ Croatian pupils gave slightly higher average ratings than Dutch pupils
- ✦ quantitative data gives only a preliminary view
- ✦ oral, in-class feedback might offer richer insights in the future



Analysis and Recommendations | Lessons Learned | General Insights

- ✦ connect abstract concepts to concrete, real-world contexts
- ✦ start with analogue activities before introducing digital tools
- ✦ provide clear and consistent instructions and well-prepared materials
- ✦ active teacher involvement is essential for long-term knowledge integration
- ✦ ensure technological readiness: working devices and stable internet
- ✦ adapt activities to accommodate varying levels of knowledge and interests
--> promotes inclusiveness and meaningful engagement for all pupils



Analysis and Recommendations | Lessons Learned | Practical Adjustments

- ✦ redesign second session to avoid the need for mobile phones
 - ☆ not all pupils have phones → feelings of exclusion
 - ☆ some pupils distracted by their phones
- ✦ review pupil evaluation strategy: extreme scores reduce usefulness of averages
 - ☆ in-class oral evaluation could yield more qualitative feedback
 - ☆ introduce a neutral classroom observer for more objective assessment



DIRECTORS

Digital data-dRiven EduCaTion FOR kids



Otvoreni obrazovni sadržaji za

poučavanje podatkovne pismenosti

u nižim razredima osnovne škole

Podatkovna pismenost danas su ključne, posebno za mlade naraštaje. Projekt **Digital data-dRiven EduCaTion FOR kids** usmjeren je na **promicanje pismenosti u osnovnoškolskom obrazovanju** kroz nove nastavne metode i aktivnosti. Radionice provode Sveučilište u Zagrebu u suradnji s nizozemskim Tehnološkim Centrom, u okviru programa Erasmus+ sufinanciranog sredstvima Europske komisije.

DIRECTORS razvili smo **tri radionice** za djecu nižih razreda osnovne škole, koje su strukturirali u tri razine podatkovne pismenosti, a svaka je prilagođena dobi i predznanju učenika. Radionica 1: **Podaci u našim rukama (i mobilnim uređajima)** temeljne podatkovne vještine, Radionica 2: **Geoprostorni podaci (i karta) u stvarnom svijetu** usmjerena je na srednju razinu vještina, dok Radionica 3: **Izvori podataka** potiče na razvoj naprednijih vještina.

Radionice se od dva susreta, a svaki susret obuhvaća dva školska sata u trajanju od 45 minuta. Radionice smo pažljivo osmislili kako bi učenicima pružili praktično iskustvo kroz primjenu u stvarnom svijetu, omogućujući im primjenu usvojenih koncepata u stvarnim kontekstima temeljenim na **5 korakima ciklusa rada s podacima** – od (1) prikupljanja podataka koje učenici prikupljaju iz okruženja, preko (2) obrade podataka u „djeci čitljiv“ oblik uz provjeru točnosti prikaza i poticanja prostornog mišljenja, sve do (5) kritičkog zaključaka iz podataka i o samim podacima.

U radionicama radionice učenici ove vještine primjenjuju izvanmrežno, odnosno ručno, što gradivo prenosili u mrežno okruženje koristeći digitalne tehnologije. Radionice se odlikuju svojom otvorenosti na interaktivnom i praktičnom pristupu koji učenike aktivno uključuje u rješavanje stvarnih i virtualnih zadataka.



učenici
ISCED razina 1
PRIKUPLJANJE PODATAKA
učenici prikupljaju podatke
iz okruženja stvarnog svijeta

ANALIZA PODATAKA
postavljanje pitanja,
izvlačenje uvida iz podataka

VIZUALIZACIJA PODATAKA
prikaz podatke na jasan način,
poticanje prostornog razmišljanja

**KO RAZMIŠLJANJE
UKLJUČIVANJE
u radionicama s podacima**





Conclusion

- ✦ DIRECTORS project explored hands-on workshops promoting data literacy
- ✦ workshops covered full data cycle: collection, processing, analysis, visualization
- ✦ interactive, hands-on approach boosted engagement and foundational skills
- ✦ differences between Croatia and the Netherlands offer insights for refinement
- ✦ success factors: concrete contexts, clear plenary instruction, teacher involvement
- ✦ one additional cycle planned to refine methods based on lessons learned
- ✦ early results are promising – continued iteration needed for lasting impact



Contact information:



 [DIRECTORSproject](#)

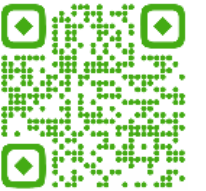
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