



FACILITATORS GUIDE

Games are ancient. Like making music, telling stories, and creating images, playing games is part of what it means to be human.

- **Zimmerman & Chaplin (2013)
Manifesto for a Ludic Century**

Acknowledgements

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DALI: Data Literacy for Citizenship

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Introduction

This document acts as a guide for facilitators when using the DALI Game-based Networked Learning Systems (GBNLS) which have been designed according to an epistemic, social, and set design, to aid the creation of a collection of ten DALI games. This document introduces the following sections: the DALI framework, learning aims, and the game's content. Additionally, some of the basic characteristics associated with each game, such as target audiences, time taken to play, and suggested player numbers, are included. Suggestions to help aid learning before, during and after the session are also introduced.

DALI Framework and GBNLS

Data literacy is the ability to draw significant information from data. It implies finding ways to make informed decisions in one's everyday life, and in various contexts according to personal or collective goals. To ask and answer questions from data sets, through an inquiry process, whilst considering the ethical use of data.

It includes understanding of data, awareness or attitudes towards non-neutral or biased data, in data collection, etc. It implies knowledge about collecting, selecting, storing, preserving and managing data, analysing, evaluating, interpreting, critiquing, applying and working with data, and representing, visualising, and communicating stories from data. Data literacy includes skills to make critical judgments and interrogate the claims accompanying data systems, including ethical and legal aspects that affect the user's and other people's rights. It also comprises the ability to use data as part of a design process and solve problems to make decisions for different purposes. The following tables present the first level, level – A, of skills per element and sub-element.

Understanding Data

Element	Sub-Element	Skills - Level A	Games
Understanding Data	Knowledge	What is data, how it is created?	Data Iceberg
	Awareness	Being aware / Knowing about the existence of data.	Wifi and Data! Dali Life
	Critical Thinking	Knowing that data have a value / Knowing data can be used for multiple purposes.	Data Takeover

Acting on Data

Element	Sub-Element	Skills - Level A	Games
Acting on Data	Collecting Data	Use external devices or apps to collect data.	Protearn Your Data
	Managing Data	Creating, editing, and storing simple file formats like .txt or .xls to manually insert the data.	DALicious Week
	Sharing Data Artifacts	Share and communicate data sets that already exist under ethical considerations.	Game of Phones

Engaging Through Data

Element	Sub-Element	Skills- Level A	Games
Engaging Through Data	Policy and Regulation	Understanding how society shapes data use / influences policy making.	Daliopoly
	Taking Decisions	Understanding civil action / individual potential to use data.	Where is Data in Your Story?
	Data Activism	Participating - understanding data activism movements and how these can change the use of the data that stakeholders create.	Data Chain
	Data Advocacy	Understanding your influence on peers or stakeholders to help them understand the potential and applications of data.	Databi

Ethics & Privacy. A fourth transversal element (4), 'Ethics & Privacy', can be found in each of the three main elements. An ethical perspective must underlie all of the knowledge, skills and levels in the framework.

For further information about DALI framework, visit: <https://dalicitizens.eu/index.php/dali-data-literacy-framework-2/> or scan the QR-code shown here.



Games and the Pedagogical Strategy

Against the backdrop of the DALI framework, the project has developed a holistic strategy that relates to the games which have been designed to promote data literacy skills with a pedagogical strategy to put them into practice with adults of all ages using a networked and playful approach. To outline the learning experience, the pedagogical design establishes the following elements for consideration:

- **Epistemic design** - Objective of the game, game mechanics and rules, estimated playing time, ethics and privacy issues.
- **Social design** - Social aspects, number of players, roles and adaptations according to the different adult groups.
- **Set design** - Game materials.

The tables shown on the following pages present a short summary of each Game-based Network Learning Strategy, and some of the key elements according to the original design of each game and one target group.

Young Adults

Young Adults					
Epistemic Design			Social Design		Set Design
GBNLS Name	Game Name	Est. Duration	No. Players	Roles	Materials
Taking Decisions with the Help of Data	Where is Data in Your Story?	20-30 min.	5 players min.	Player A random player for time control and note taking	<ul style="list-style-type: none"> • 20 cards about Individual • 20 cards about Location • 20 cards about Activity • 4 cards about Data
Understanding Data Generation Happens Everywhere	Wifi and Data!	30-60 min.	2-4 players	Player	<ul style="list-style-type: none"> • 1 dice • Different coloured figures to represent players • Pens, pencils, and paper • Cards • Game board

General Adults

		Epistemic Design		Social Design		Set Design
GBNLS Name	Game Name	Est. Duration	No. Players	Roles	Materials	
Generate Discussion Around Data Literacy	Dali Life	30-60 min.	2-5 players	Player	<ul style="list-style-type: none"> • Game board • 62 Event cards • 62 Action cards • Counters or tokens • 1 – 4 6-sided dice 	
Save and Manage Data and Time	DALLicious Week	40 min.	2 players min.	Player	<ul style="list-style-type: none"> • 5 different types of game board (optional) • 36 Normal cards • 10 Collective cards • 20 Harmful cards 	
Citizenship Through Data Activism	Data Chain	30-45 min.	4 players (2 teams of 2 players)	A Data Activist A Data Broker	<ul style="list-style-type: none"> • 20 Artefact cards (10 data activists and 10 data brokers cards) • 32 Action cards 	

General Adults (Continued)					
		Epistemic Design		Social Design	Set Design
GBNLS Name	Game Name	Est. Duration	No. Players	Roles	Materials
Substantiating the Value of Data	Data Takeover	15-45 min.	3-5 players	Player	<ul style="list-style-type: none"> • 3 Hacker powerful actor cards • 3 Influencer powerful actor cards • 3 Journalist powerful actor cards • 3 Lawyer powerful actor cards • 3 PR Consultant powerful actor cards • 50 Real Coin tokens • 50 DataNugget tokens • Summary card for each player • Token Tracker for each player
Data Flux and Collaboration	Databi	1 hour	2 players min.	Player	<ul style="list-style-type: none"> • 45 Cards • A life and clue board • Memory helper

Senior Adults

Senior Adults					
Epistemic Design			Social Design		Set Design
GBNLS Name	Game Name	Est. Duration	No. Players	Roles	Materials
Relating Digital Activity with Data Creation	Data Iceberg	1 hour	2 players min.	Player	<ul style="list-style-type: none"> • Game board for each player/team • 40 cards • White jokers • Black jokers
Relating Digital Activity with Opportunities to Learn About Ourselves	Protearn Your Data	1 hour	2 players min.	Player	<ul style="list-style-type: none"> • Game board • 72 Data cards • 24 Bulb cards • 24 Lock cards • 24 Forbidden cards • 3 Thief cards (Dali logo) • Dice • 1 token per player • 1 solution sheet

Workers

Epistemic Design			Social Design		Set Design
GBNLS Name	Game Name	Est. Duration	No. Players	Roles	Materials
Discovering the Language of Data Literacy	Daliopoly	1 hour	2 players min.	Card Dealer Player	<ul style="list-style-type: none"> 35 Artefact cards 62 Action cards
Data and Citizenship	Games of Phones	Less than 1 hour	2 players min.	Referee Player	<ul style="list-style-type: none"> 120 cards 6 quick Start Rules cards

All Groups

Epistemic Design			Social Design		Set Design
GBNLS Name	Game Name	Est. Duration	No. Players	Roles	Materials
Using Simple Escape Rooms for Education	Dali Escape Room	1 hour	2-6 players	Codebreaker Facilitator	<ul style="list-style-type: none"> A crossword A word alignment puzzle A word grid puzzle A bonza puzzle A Vigenère code Pictures & colours puzzle An odd word out puzzle A missing vowel puzzle A rebus

Target Groups and Playing Contexts for Game Design and Adaptations

A range of diverse games have been designed in adherence with the prior definition of personas. Therefore, each game was firstly designed as applying to one specific target group, identified with two persona profiles, and later adapted to the other adult groups. DALI also contemplates intergenerational groups, whose learning has two main lines of conceptualisation (Leek & Rojek, 2021):

- Intergenerational learning between related generations (family members)
- Intergenerational learning between unrelated generations (non-family members)

The following tables summarize the description of each games design for the original target group, and different adaptations to other adults.

Young Adults					
Players	Age	Original Games for Target Group	Game Original Design	Adapted Games for Target Groups	Game Adaptation for Target Group
Young Adults	18-29	<ul style="list-style-type: none">• Wifi & Data• Where is Data in Your Story?	Original games for this target include card materials and design layouts in small sizes.	<ul style="list-style-type: none">• Data Takeover• Data Chain• Dalicious Week• Databi• Data Iceberg• Protearn Your Data• Daliopoly• Game of Phones	Adaptations for young adults include new rules for quicker and more exciting gameplay, such as adding challenging rules for extra requirements.

Senior Adults

Players	Age	Original Games for Target Group	Game Original Design	Adapted Games for Target Groups	Game Adaptation for Target Group
Senior Adults	65+	<ul style="list-style-type: none"> • Data Iceberg • Protearn Your Data 	Original games for this target are focused on knowledge and are aimed at enhancing discussion amongst participants.	<ul style="list-style-type: none"> • Wifi & Data! • Where is Data in Your Story? • Data Takeover • Data Chain • Dalicious Week • Databi • Daliopoly • Game of Phones 	<p>Adaptations for seniors are created in diverse ways:</p> <ul style="list-style-type: none"> • Adapting materials, making them bigger, with larger size fonts. • Adapting contexts, including examples and situations that are closer to seniors' interests. • Adding glossaries that support understanding. • Allowing more time for answers. • Reducing the number of requirements for correct answers.

General Adults

Players	Age	Original Games for Target Group	Game Original Design	Adapted Games for Target Groups	Game Adaptation for Target Group
General Adults	30-64	<ul style="list-style-type: none"> • Data Takeover • Data Chain • Dali Life • Dalicious Week • Databi 	One of the games in this group offers collaborative gameplay deeply tied to the winning condition. Games originally designed for this target group are developed from a critical perspective, focusing both on the double-edge sword of a datafied society and the skills needed to manage data.	<ul style="list-style-type: none"> • Wifi & Data! • Where is Data in Your Story? • Data Iceberg • Protearn Your Data • Daliopoly • Game of Phones 	Adaptations for general adults include socio-cultural diversity. Moreover, these adaptations are recommended for intergenerational groups, since they also introduce child friendly elements.

Workers

Players	Age	Original Games for Target Group	Adapted Games for Target Groups	Game Original Design & Adaptation for Target Group
Workers	18+	<ul style="list-style-type: none"> • Daliopoly • Game of Phones 	<ul style="list-style-type: none"> • Wifi & Data! • Where is Data in Your Story? • Data Takeover • Data Chain • Delicious Week • Databi • Data Iceberg • Protearn Your Data • Daliopoly • Game of Phones 	Games and adaptations for workers highlight the relevant data literacy content contextualised in professional settings. For example, some games increase workers' awareness on the different lobbying roles played by the diverse agents in the tech cluster. Other games promote skills in data management for safe, ethical, and productive usages, as well as teamwork and team building.

All Adult Groups

Players	Age	Original Games for Target Group	Game Original Design	Game Original Adaptation for Target Group
All Adult Groups	18+	<ul style="list-style-type: none"> • Escape Room 	<ul style="list-style-type: none"> • Team-based • Nine interlocking puzzles 	Adaptations are only possible through the facilitator's role; extending the timeframe or providing feedback to help teams decode clues.

How to Implement the Games

The recommended strategy includes three steps: before playing the games (Let's Play!), the playing time (Time to Play!) and after having played (Time to Finish!). There is also a slide presentation that you can use to support the introduction of each step.

Let's Play (Activation)

You can start the DALI game session by introducing the following elements:

- Start by welcoming participants in the session held in your institution.
- Optionally, introduce the DALI project aims and partnership.
- Shortly describe the concept of data literacy, the common core element of each game.
- Start a discussion with participants about their current knowledge and skills related to data management. It is important that participants understand concepts about data which might be key to play the games, i.e., types of data, data skills, data usages by business agents, etc.
- Make sure players understand the vocabulary of the games they are going to play and provide examples if participants need them to understand key works for the game.
- Introduce the games they are going to play. It should be decided whether detailed or general aspects of the games should be introduced to all participants or specific teams. In particular, make sure participants understand the objective of the game, and are aware of the difference.

- In role playing games, make sure participants understand characters and their diverse roles and how their interaction affects the gameplay.
- The pedagogical strategy of the DALI games is flexible. The facilitator can adapt the gameplay to their context, participants, and specific needs.

Before playing, you should plan the following aspects:

- Group organisation: decide how the participants will be split into separate groups, for example, according to common or different skills, guaranteeing at least one participant with advanced skills in each group, allowing participants to group themselves, or to team up with people they don't know.
- Participants can be encouraged to distribute roles among themselves, for example, reading instructions, asking for help, delivering materials, etc.)
- Planning the games, their sequence, deciding if participants will be playing a single game or more than one.
- When playing DALI games for the first time, it is recommended that participants focus on a single game to allow them to play more than one round, as the experience might be more enjoyable during the following rounds, once all players are used to the rules. It is also recommended to grant players some time to discuss and exchange opinions and thoughts emerging from their gaming session.
- A session can be organised by focusing on specific aspects or promoting diversity. Games have various materials, collaborative components, and player group dynamics. If the session planning includes more than one game, they can be combined regarding the social, epistemic, and material elements along with the persona characteristics of the player's group:
 - In general, it is recommended that participants first play games with more predefined game dynamics, like Wifi & Data!, which is based on questions and answers. And, afterwards, play the ones with more free and creative game dynamics like Where is Data in Your Story? Also, the selection of games can be done using a collaborative component, for example, those which are cooperative like Databi, or that can be easily organised for pair work like Dali Life, or those with a greater individual or competitive approach like Databi or Data Chain.

- Games that should be played can be chosen depending on participant's profiles and their prior experience with games in general. Experienced players could enjoy more tactical games like Data Chain or Data Takeover, while casual players might engage more with games that are more mainstream, like Daliopoly or Data Iceberg.
- Games have various material types: the ones that are card-based like Game of Phones could pair well with the ones with boards like Dali Life, Data Iceberg or Protearn Your Data.
- Games highlight different approaches to data literacy. For example, Data Action or Data Takeover aim provide a critical perspective, Wifi and Data! or Data Iceberg seek to enhance knowledge, Databi introduces data management, and DALLicious Week looks at data related skills.

Before starting the session, you need to make sure that you have the availability of the following materials:

- Moveable furniture.
- Laptop and projector.
- Results counter.
- Other items such as dice, pencils, and paper.

The facilitator can use and adapt the slides 1 to 21 shown on the following pages.

Slide 1



Playing
DALI

City
Date

Put your LOGO here

This slide can be presented to welcome participants, use your own university/institution logo to give a key role to local partnership.

Slide 2



DALI is a project developed in strategic partnership with the Erasmus+ program of the European Commission, developed by five universities between 2021 and 2023.

Slide 3



DALI stands for Data Literacy for Citizenship. DALI aims to empower individuals (young adults, general adults, seniors) for responsible citizenship / civic engagement in terms of data, by acquiring and developing key competences related to data literacy. Adults (as teachers, parents, families, workers, and so on) are in charge of the social uses and regulation of data, both at home and in the education of young people, and moreover, in most of our country's adults are legally responsible for their children's data. Furthermore, seniors encounter data in their daily lives, such as grandparents interacting with their families, and as citizens interacting with public services such as tax or health systems.

Slide 4



Facilitators can introduce the data definition and skills related to the management of data:

Data literacy is the ability to draw significant information from data. It implies finding ways to make informed decisions in one's everyday life, and in various contexts according to personal or collective goals.

Data can be defined as “measurements or observations that are collected as a source of information.” (Australian Bureau of Statistics, 2022). We do not just have a passive relationship with data as something that is extracted from us as we live our Postdigital lives. Therefore, knowing how to effectively and ethically deal with data, and, more generally, how to navigate our increasingly datafied day-to-day realities, has become an essential capability for work, education and citizenry in contemporary cultures and societies (Castañeda et al., 2024).

Slide 5

What do
you know
about your
data?

Start by asking participants about their current data knowledge and practices. If there is participation, this could take a long time. So, it is important to summarise contributions and take notes about the current awareness of players data literacy skills and knowledge. To close the session, these notes can be useful to extend new knowledge after playing.

Slide 6

Let's
play



Announce the games that are going to be played.

Slide 8

Wifi and Data



It is aimed at understanding and being aware of the existence of data



It is an adaption of the popular board game Snakes and Ladders



The first player whose figure reaches the finish line (position 36) wins the game

- Aims.
- Based on a popular game (Snakes & Ladders).
- Winning conditions.

Slide 9

Where is Data in your Story?



Understanding civil action on data / Individual potential to use data / Engaging through Data / Taking decisions on data



Imagine how data is created through digital devices by the people doing the activities in the contexts suggested by your cards

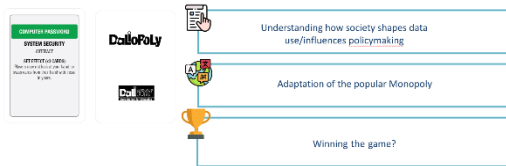


The narrative that gets the most votes wins the round. After three rounds the winner of the game is announced: the one who won the most rounds, wins.

- Aims.
- Storytelling.
- Winning conditions.

Slide 10

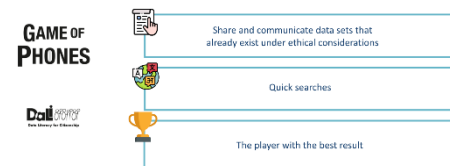
Daliopoly



- Aims.
- Based on a popular game (Monopoly).
- Winning conditions.

Slide 11

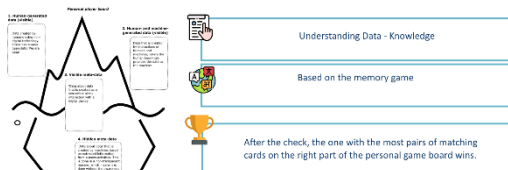
Game of phones



- Aims.
- Quick searches.
- Winning conditions.

Slide 12

Data iceberg



- Aims.
- Based on a popular game (Memory).
- Winning conditions.

Slide 13

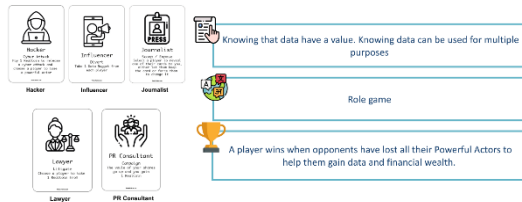
Protearn your data



- Aims.
- Based on a popular game (The Goose Game).
- Winning conditions.

Slide 14

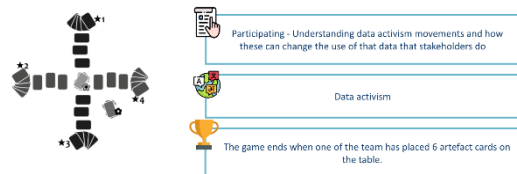
Data Takeover



- Aims.
- Role game.
- Winning conditions.

Slide 15

Data chain



- Aims.
- Data activism.
- Winning conditions.

Slide 16

Databi



Understanding your influence on peers or stakeholders to help them understand the potential and applications of data



Databi is a cooperative game, which means all players are on the same team.

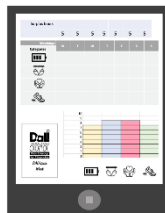


You all have completed all the categories... Winners!

- Aims.
- Cooperative game.
- Winning conditions.

Slide 17

Dalicious week



Creating, editing and storing simple file formats like .txt or .xml to manually insert the data.



As the week has to be complete, there will be 7 rounds, it means, each round represents a day of the week. For each day there will be as many turns as players.

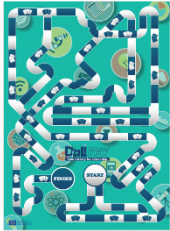


The person who reaches his/her ideal week is the winner (or the one who is the nearest after 7 rounds)

- Aims.
- Everyday life is data.
- Winning conditions.

Slide 18

Dali Life



- Exploring key concepts
- The gameplay can be very tactical
- The winner of the game is the first person to reach the circle marked 'FINISH'.

- Aims.
- Competitive tactical game.
- Winning conditions.

Slide 19

Dali Escape Room



- Knowing that data has value
- A team-based game with 9 interlocking puzzles
- The players must complete the game within an allotted time frame.

- Aims.
- Team-based game with 9 interlocking puzzles.
- Winning conditions.

Slide 20

5 online minigames

Delete if the minigames are not played.

Slide 21

Organization
of the players
and groups



Time to ask players to split in groups.

Time to Play (Application)

Once the games have been introduced, invite the participants to start playing. To support play you should consider how to conduct your role as facilitator, and decide on the following aspects:

- Whether to give feedback about game dynamics or data literacy only when help is requested or offer advice to all teams while they are playing the games.
- Determine the proficiency of the players and support those who are less confident / confused. Ensure a facilitator is present as an interactive guide for the first play through.
- Halfway through the session, you can consider using a follow-up activity to promote self-reflection on data literacy skills or enhance the gaming experience.
- During intergenerational sessions, pay attention to the relationship and verbal exchanges between younger and older participants. In situations where a generational gap exists, differences in data practices and skills are more likely to be noticed. When playing with children, adults can be asked to support children's self-reflection for data practices.

The facilitator can use and adapt the slide 22.

Slide 22

Time
to
play



This slide can be projected during the play. Alternatively, a time counter can be projected.

The following provides additional advice on a per game basis, so facilitators can adapt feedback for students during play.

Game of Phones

- Try to stimulate discussion by introducing related concepts like i.e., Creative Commons, copyright, safe websites, etc.

Where is Data in Your Story?

- For more engagement, set a maximum time for each round.
- Take advantage of narratives by working on the story development and discuss data in everyday life.

Data Iceberg

- During playtime, the facilitator function is to help players avoid getting stuck in one solution.
- The facilitator will show the answer sheet and for some cards there may be more than one correct answer. If the player/group gives enough valid arguments the answer can be taken as correct.

Wifi and Data!

- Give clarifications on some of the answers, in particular about where to find data on mobile devices, etc.

Dalicious Week

- The facilitator should help players to come back to the chart and reflect about how they have collected and written their data on the schedule.

Data Takeover

- Explain how the various roles and interact with each character to clarify how each role affects play.
- Reinforce learning with real-world examples of data takeover events. This could be during play or discussed in depth after the game is complete.

Daliopoly

- Observe the proficiency of the players and support those who are less confident / confused.
- The facilitator is present as an interactive guide for the first play through.

Databi

- Give a dummy demonstration and explain how to use all the given resources to learn the game dynamics. Make a previous test round.
- Strongly recommend the players avoid repeating scenarios and widen the discussion.
- Give importance to how the players reach solutions and which type of sentences get to the solutions.
- Give an order of participation to the players and make sure all players are involved.

Data Chain

- Players can generate a narrative using the topics on each card they play, as they play them. The facilitator records this and then includes the narrative in the post-game debrief.
- There could be a secondary activity facilitated which is to solve a scenario using aspects of data activism introduced within the game itself.

Dali Life

- Explain the game dynamics involved in using action and event cards, and movement with a dummy demonstration.
- Encourage players to be competitive with other players.
- Schedule the game to last around 1 hour maximum. Add or remove dice from the game to alter playing time.
- Make sure that people understand the cause and effect between cards, and why some have positive or negative implications.

Protearn Your Data

- Exemplify all the categories and connect them to specific verbs (check, share, publish...).
- Introduce the forbidden and bulb cards first, then the lock cards, so that their meaning is clearer.
- Critically discuss the meaning of cards with the participants.

Time to Finish (Closing)

After playing, the facilitator can close the session by promoting participant's self-reflection in diverse ways:

- Ask about participant's gameplay experience, their fun, engagement, and feelings.
- Discuss mistakes made during play, and how they improve participants' awareness about data practices.
- Ask about data literacy concepts, and how they have understood the concepts and the related skills.
- Reflect with participants on how data literacy works around our lives, and how we can influence on data and support change.
- Ask about participant's data literacy skills; how do they normally manage data, and how they can improve their data routines based on their learning.
- Show the DALI summary of the DALI framework with the four areas and three levels and show the skills they have practiced.
- Ask about their self-assessment of their personal knowledge and current learning, and what their next steps for future learning might be.
- Show the DALI Toolkit website (<https://toolkit.dalicitizens.eu>) from which participants can download the “print and play” versions of each game.

The facilitator can use and adapt slides 23 to 26.

Slide 23



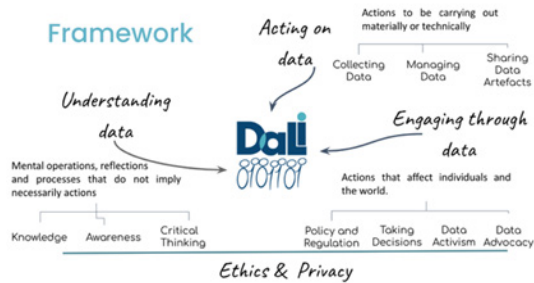
Show the screen to announce that the time for playing is over. You could use an alarm clock sound to announce the end of play.

Slide 24

What have
you learnt?

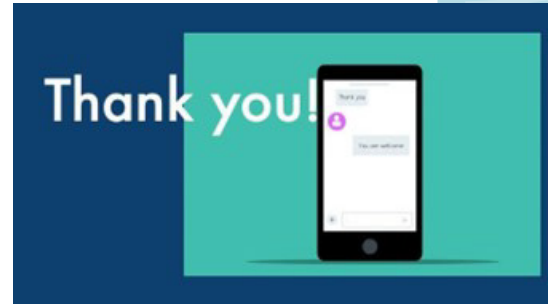
Final reflection and assessment time. Players can be asked to participate by answering questions about what they have learned. It is recommended to ask about prior knowledge to compare, reflect, and extend knowledge and skills.

Slide 25



The skills mentioned by adults can be contextualised in our framework. The framework is available in the DALI website

Slide 26



Say thank you for their participation and be as emotional as possible.

Conclusions

The Facilitator Guide is part of the materials included in the DALI Toolkit that you can find online (<https://toolkit.dalicitizens.eu>). This document presents an overview of the DALI games to promote the elements and sub-elements of the related data literacy framework in the beginner's level (Level - A). These games are the key element of a whole strategy to promote data skills among adult citizens based on a networked and playful approach. For a deeper knowledge of the pedagogical approach conceive for each game, see the Game Based Network Learning System Handbook.

Some general recommendations about how to play the DALI games and how to introduce gaming sessions are suggested. However, games are highly influenced by players and their environment, so as well as following this guiding advice, enjoy playing and be inspired to find your own creative solutions. Please, also share pictures and thoughts of your gaming experience on social media using our hashtag #g4dataliteracy or contact us on the microblogging site X, formerly named Twitter (@DaLi_Citizens).

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