Informal learning and awareness raising tools

In the framework of the PREHealth project
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Introduction

The present report was prepared in the framework of “Output 6 – Other informal learning and awareness raising tools” of the project PREHealth: Promoting education and jobs to enhance the use of urban blue and green infrastructure for health and fitness. It aims at presenting a series of Augmented Reality\(^1\) (AR) digital tools selected specifically for accommodating the needs and objectives of the conceptual model developed in the framework of the project regarding informal learning and awareness raising in the field of promoting health and fitness in urban open spaces.

Within the following units of the present report, the selected AR tools are presented with regard to their merits, features and characteristics that qualify them for implementing the developed conceptual model. The tools’ potential application within the conceptual model is also described, accompanied by instructions on how to best apply them and links for further support and information. Finally, a learning course programme is outlined, describing the way the tools can be integrated within a learning process that can be adapted to different target groups of learners and different formal or informal educational settings.

The proposed AR tools were selected in order to better respond to the following criteria:

- Open source and free of charge: The tools selected are open source and free of charge, at least in their proposed version for application, in order to make sure they can be easily adopted within a variety of learning frameworks, both formal and informal.
- Easy to apply: The selected tools are easy to use, without demanding any expertise in programming by the developer. Although the level of complexity and available features vary from tool to tool, they all include friendly user interfaces in editor mode, inviting developers/editors to explore their capabilities and experiment. All selected tools can be applied by all target group members in different educational settings, both teachers/trainers and learners.
- Great potential for learning and awareness raising: All selected tools have been tested in the past by PREHealth project partner organizations regarding their learning and awareness raising potential, and their capabilities in this field, both in formal and informal educational settings, have been proven and documented. They can facilitate learning both during their application and afterwards, as finished and freely available learning tools.
- Facilitating engagement and participation of users: All suggested AR tools include a strong component of encouraging the users’ engagement and active participation. Users are encouraged to engage in physical exercise through the tools’ AR features, as well as actively participate in proposing opportunities for health and fitness activities and contributing to the design of their city’s open spaces to accommodate such activities.
- Suitability of AR features: In the last few years there are more and more tools available, offering Augmented Reality features on mobile devices. However, not all of them offer features suitable for applying the conceptual model developed within the PREHealth project and pursuing the learning and awareness raising objectives outlined.

\(^1\) Augmented reality is defined as the integration of digital information with the user’s environment in real time. Unlike virtual reality, which creates a totally artificial environment, augmented reality uses the existing environment and overlays new information on top of it.
Stability and support: The suggested tools are relatively stable in their applications, their limitations regarding different operating systems for mobile devices have been documented, and include a support centre or an active online support community.

Finally, the application of the proposed AR tools through the proposed learning course programme will be adapted in the next stage of the project for use in Higher Education, Secondary Education, adult education, and in order to empower disadvantaged groups.
Siftr – a platform for mapping, visualization, collaboration, interaction
www.siftr.org

What is Siftr
Siftr is an open and free platform for collaborative mapping developed and supported by the Field Day Lab, a lab active in the development of educational games and digital learning resources within the University of Wisconsin in the USA, led by David Gagnon, creator of the popular Location-Based Game development platform ARIS.

Siftr is a freely available platform, accessible both from desktop devices (e.g. desktop computer) as well as from mobile devices (e.g. smartphones or tablets), that offers anyone the opportunity to develop collaborative learning activities with reference to the real world, without any particular prior digital skills. It extends learning beyond computers, books and classroom walls – facilitating learning in the real world.

What does it do? Application in the framework of PREHealth
Siftr allows a facilitator\(^2\) to create framework for mapping input according to a certain theme, and then let either a small group or the general public use their smartphones to go out and document geographically relevant material. Siftr gathers this input in the form of photos, text and of course location, and illustrates it so that it is easy to view and discuss the data as a group on a larger display together. An additional feature of Siftr is the ability to interact by adding comments and "liking" certain input (similar to "like" on Facebook). The input is uploaded online on the spot through a smartphone or a tablet, or through a computer by uploading material online.

In the framework of PREHealth, the application of Siftr is related to the provision of information and awareness raising on physical activity, active travel and active recreation opportunities, providing feedback on the physical space along and around the “Health and fitness itinerary”, and suggesting improvements either related to the facilities and infrastructure present, or to the activities that may be pursued along the itinerary and the benefits for the user's health and wellbeing.

Siftr can have various applications in different areas and disciplines. It is not limited to this one application area, but instead is a general purpose tool that should be able to find diverse applications because there are so many ways it might help bring together people, ideas, and places. However, one distinct area of application of Siftr that looks promising is citizen science. There are many citizen science projects that wish to crowdsource data gathering. It has been one of the most attractive aspects of the internet that large numbers of people can not only find out about scientific topics, but participate in the creation of new scientific knowledge. An example of that collaborative creation of knowledge is Galaxy Zoo, where scientists created a platform for amateur astronomers to help identify interstellar objects (see Reinventing Discovery by Michael Nielsen). Not only was the crowd able to help identify objects of interest more quickly and accurately than a small number of scientists who were officially running the projects or computers, their curiosity led them to document and discover brand new astronomical phenomena.

\(^2\) The facilitator or author of a Siftr in this framework refers to the person or organisation who creates the Siftr, defining the purpose of the collaborative mapping activity and setting the parameters of users’ engagement.
Furthermore, Siftr's features for on-the-scene collaborative mapping are freely available and can be easily used by all, assuming a basic level of skills in using computers and smartphones (i.e. browsing the internet, downloading and installing apps on a mobile device, taking photos). Finally, Siftr is a responsive web app. It is designed to be used on smartphones (both Android and iOS) as well as on desktop web browsers. There are no apps to download, just the custom URL to type in. Though it is possible to use any of the features from any browser, the basic idea is that users on phones, out in the world, will collect data. Then the group or individuals who care about the map as a whole can get together and bring up the site on a larger screen, maybe projected, to discuss or make other assessments from.

**How Siftr works**

Siftr is very simple for both authors, mappers, and viewers. Below there is a brief description for each activity.

**Authoring a siftr**

Authors or facilitators create an account (or use their ARIS account credentials) at www.siftr.org. Then, the author creates a

- Name for the siftr. For example, “Athens health and fitness route”.
- URL. For example, https://siftr.org/athenshealth
- Description of what to do with the siftr, i.e. instructions for the mappers. For example, “Spot opportunities for physical exercise, active travel and active recreation along the selected itinerary, using the available infrastructure. Be imaginative and document your ideas through photos and descriptions. Don’t forget to also suggest improvements in the infrastructure.”
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Screen 1: The “Overview” screen in creating a Siftr
Then the author of the siftr:

- Selects the optimum map settings like the map focus, the map appearance theme (there are currently 5 themes to choose from, i.e. silver, retro, aubergine, classic, and satellite), and the colour palette for the map pins. (see Screen 2 and Screen 3)

- Customizes the categories of collection and the colors that represent these categories. For example, “Running”, “Cycling”, “Alternative exercise”, “Resting area”, “Yoga”, “Improvements” etc. (see Screen 4)

- Selects additional data collection formats (optional). The standard formats are the main photo, the caption and the categories. The optional available formats are single choice question, multiple choice question, small text field, large text field, and an additional photo. Attention: Every time a data collection format is set, the author must Save the field (button at the right bottom corner) otherwise the field will be lost (see Screen 4)

- Decides basic permissions regarding viewing and contributing to the map (see Screen 5)

The siftr is ready. It’s fast, easy and powerful. Once a siftr is there, and depending on the permissions the author chooses, anyone can both view it in a browser and add data to the siftr.
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Screen 2: Selecting the map focus
Screen 3: Selecting the category theme, i.e. the pins colour palette.
Screen 4: Selecting the different categories and assigning colour. Also selecting additional data collection formats (optional).
Screen 5: Selecting basic permission and privacy settings
Mapping

The users with access to the sifr can then download and install the sifr app on their smartphones or tablets (Android and iOS), create an account or login using their account details, explore and find the sifr they are interested in, and visit the area in the sifr map or walk through the itinerary described.

The users who add a pin on the map in their location by going through the data collection sequence, i.e. taking the main photo, adding a caption, selecting a category (and colour) and filling in any of the additional data collection formats, are called “mappers”.

Adding a pin on a sifr map is fast and easy. Sifr automatically registers the mapper’s location and places the pin there, and links all the data filled in by the mapper to that specific pin. That pin is then visible to all other mappers and viewers who can either “like” it or comment on it.

As mentioned above, each pin also is the root for a comment thread. Mappers and viewers can ask each other questions right there in sifr, add additional information, and even share the post (it is after all just a special webpage) via social media. Do note though that audio and video are not currently supported.

When a mapper creates a map pin, the default assumption is to use the mapper’s current GPS coordinates, but the point can be manually moved as well.
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Screen 6: A siftr on a smartphone. Note the big plus for adding a new pin and the purple dot (that is the position of the user while taking this screenshot).

Viewing

As a responsive web app, siftr looks a bit different on a bigger screen, giving viewers more ways to look at what has been collected. There are map-based views, image-based views, and ways to filter by category or search for users and text. This is a nice way to review a collection with a group. Note too, that you can also add pins right here - you don’t need to be on the mobile device.

On Screen 7 below you can see what a siftr looks like on a computer browser.
Screen 7: The siftr as seen on a desktop browser. Easy to see and filter your collections, but you can still map if you want to.
Further information – Where siftr fits in amongst other mapping tools

Unlike AR game design platforms, in the world of custom mapping there are other big players in terms of platforms. Google Maps and GIS are such popular platforms; however, while both have their places, neither of them yet allow you to both:

- Use the software without any prior training or expertise
- Upload while out in the field

In addition, both Google Maps and GIS concern only about the objective side of mapping. To mark what is there. But so often, trying to understand what is going on in a place or with an issue, working on a map becomes about more than placing a pin. Conversations at particular waypoints matter as much or more than the fact that the point is marked. Siftr is build with these conversations, and the emerging understandings they represent, in mind. Each waypoint created in siftr has a comment thread attached, permitting conversation right where you are.

Let’s take some time to to think about user experience and who it is that you might be involving in the use of these tools. GIS, the standard software that scientists and industry rely on to understand physical place, is designed to deal with and accurately represent data. It is rather difficult to learn to use and look at, especially for novices.

GIS is a serious mapping tool, but its depth is accompanied by a complex UI

These problems of course become invisible to those professionals who do use it over time, and the way the visualizations feel matters less than the information they represent. They need what the
tool does and so they get used to it and take for granted that the difficulties in learning and using the tool are necessary hurdles to joining the profession.

So while GIS is a deep tool with a lot of functionality, learning how to use it is a matter of building up a specific technical skill. It is hard to simultaneously learn about place and how to think about place. The time spent doing this background learning can only be justified as a bearable cost for larger enterprises, not something anyone can pick up for a bit. GIS is not for more casual mapping and so its appropriateness is limited to situations that can support deeper investments.

The same is not true of Google Maps. It was designed to be simple and easy, something anyone anywhere should be able to pick up without distracting too much from whatever use they are putting their maps to. But Maps seems to err too far in the other direction for uses that are not as simple as their interface. While Google Maps is easy to use, the part that is easy to use is very limited in terms of the data it can contain. A marker can have an image, title, description and that’s it. One can also draw figures, directions, and measure distance. There is some visual customization possible of the underlying map. These are enough for many uses. But if you need something a bit more involved, there’s not much you can do to extend these capabilities unless you start getting into special file formats and programming as with GIS.

Maps is also built for a scenario where one author creates a map for an audience to use at a later time. To create a scenario where you are hoping to ask others out in the field to help you gradually build up the information you want in the map, or where a map is a contingent, evolving conversation, it doesn’t really fit so well. Other tools are needed.

Google Maps has a simple UI for simple features

Siftr sits somewhere in between these two tools and others like them. It has also been developed in a world where mobile data collection is a given.

For a tutorial on Siftr please visit the following link: https://fielddaylab.org/courses/siftr
AR Location-Based Games tools
Platforms for developing and playing AR Location-Based Games on mobile devices

What are Location-Based Games
Hide and seek, I-Spy, police and thieves, role playing games and capture-the-flag have all been popular real-life location-based games that have been played in different versions across the globe. These games allow the players to refer to physical objects and location(s) and use their creativity and imagination in order to interact meaningfully with others, as well as with the location(s). In recent years there has been a rise in the number of creative games, interactive narratives and playful activities that are facilitated by mobile devices in such a way that the game activity follows the players’ location. A term used to describe such games is “mobile location-based games”3.

The advent of mobile devices, such as smartphones and tablets, and the fast evolution of game technology, provide great opportunities to develop place-based games that encourage participants to become immersed in playful and meaningful interactions, using different layers of information. These products also offer real opportunity for learning and storytelling about specific locations and routes, introducing the natural or built environment as a participant in the players’ interaction and experience.

In recent years, advanced mobile devices (smartphones and tablets) have made the use of location-based services very convenient4. Location-based Services (LBSs) are IT services for providing information that has been created, compiled, selected, or filtered taking into consideration the current location of the users or those of other persons or mobile devices5. With the expansion of location-based services, location-based games have also gained in popularity and become more widespread.

Many applications for modern smartphones and tablets incorporate LBSs to provide location-based information. This information can be used to give location-based advice, navigation directions, to track movement and conveniently communicate one’s current location to friends, etc. However, it can be also used in the fields of entertainment and learning, to create games that makes the position of the player an essential part of the gaming process6.

A location-based game (LBG) is defined as a form of play designed to evolve on a device in motion, directly linking the game experience with the location of the player. To create a location-based experience, usually a connection to other devices, e.g. a server or other players, is necessary. However, it is also possible to run single player games, provided that all required information is

3 Avouris & Yannoutsou, 2012.
4 Ku et al., 2008.
5 Küpper, 2005.
stored in the player’s device. In this case, a connection to other devices is not necessary to run a LBG, as long as the game follows the changing locations of the player’s device⁷.

A useful classification⁸ of potential game patterns in LBGs is outlined below:

**A. Search-and-Find**

In Search-and-Find games the player has to search for a specific geolocation in order to progress in the game. This can be made possible either by suggesting the rough location to be visited using a map in the game interface; or by giving a clue referring to the surroundings e.g. a building, a road feature or a landmark. In such games the player can choose from a range of proposed locations or move towards the single location suggested. Reaching a destination is the main objective behind Search-and Find Games.

An example of this game-pattern is Geocaching⁹ in which the player moves to a specific location in order to find a hidden physical object, usually a box containing items, then takes one item out of the box and leaves back another item in replacement to the one the player removed. GPS coordinates provide the location for the next “geocache” to be discovered.

**B. Follow-the-Path**

A Follow-the-Path game is quite similar to a Search-and-Find game with the only difference being that a destination is not the goal, but the sequence of destinations is, and how the player reaches them. Any deviation from the defined route can result in penalties for the player i.e. missing a reward/item/clue. Treasure Hunt is one of the most popular Follow-the-Path games.

**C. Chase-and-Catch**

In Chase-and-Catch games the players try to find a moving virtual target and claim it: this target can refer to the actual location of another player or the changing locations of a moving virtual object that exists only in the game world. The player is informed about the location of the target via the game interface/interactive map and the aim of the game is to approach the target quickly to “catch” it. This game-pattern promotes strategy building and physical activity while it can involve a single player or be a multiplayer gameplay. Ingress¹⁰ is an augmented reality territorial version of the Chase-and-Catch game type.

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⁸ The patterns are presented according to the work of Lorenz Lehmann, 2012

⁹ [https://www.geocaching.com](https://www.geocaching.com)

¹⁰ [https://www.ingress.com/](https://www.ingress.com/)
D. Change-of-Distance

Change-of-Distance games use the notions of proximity or remoteness between the player’s location and several geolocations within the game; the location itself or the direction of the player’s movement are not as important as the movement of the player. The player’s goal is to either move towards a location or move further away. An example of this pattern is The Journey: in this game the actual location of the player does not influence the plot, however the movement and the journey of the player are tracked, as well as the locations already visited.

Application of LBGs in the framework of PREHealth

Location-based gaming offers great educational possibilities, as it allows educators and facilitators of learning to create constructivist experiences rich in educational content. The proliferation of LBGs is due to the widespread use of mobile devices, like smartphones and tablets, with advanced location sensing capabilities like GPS satellite positioning. LBGs can be compelling for young players as well as adults. Video games are, by their very nature, built around interaction and participation. Therefore, they provide a tool for designing curricula that offer more than mere exposure to content, aiming to enrich student experience through active participation. LBGs offer an additional level of experience: due to the fuzzy border between games and real world activities, and because of the resulting changes in the game experience, players become involved and associate with the LBG, thus gaining stronger emotions and satisfaction from well-designed LBGs.

Mobile games are particularly suited to creating educational experiences in informal settings. Mobile media and augmented reality can fruitfully combine the advantages of educational video games with place-based learning.

LBGs offer great opportunities to include educational content in the playful experience by using context-aware learning tactics and content generation mechanisms like augmented reality, embedded in a mobile device game or triggered by simple technologies such as QR codes and RFID.

A feature that makes LBGs suitable for education is that they connect places with stories. In an LBG, it is possible to embed extra layers of information and narratives about, for example, historical locations or other places in a city, thus transferring knowledge as well as promoting desirable attitudes and behaviours. By visiting real places, the story becomes a personal experience linking physical objects with learning content. This conveys to the player location-specific knowledge and

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11 Montola et al., 2009.
14 Squire et al., 2007.
promotes behaviours through experiential learning, exploiting the connection between the real world and the game\(^{15}\).

Additionally, an important feature of LBGs that makes their application valuable in the framework of the PREHealth project, is that by their nature they facilitate and encourage the movement of the player in space, especially outdoors. Through the challenge offered by the game, the player is motivated to go out in the real world and move, navigating from place to place both within the game's digital space and in physical space.

Based on the above, the adoption of LBGs as the AR tools to best implement the conceptual model developed in the PREHealth project is most appropriate. The educational capabilities of the LBGs that combine game-based learning and experiential learning, as well as their distinct features for encouraging movement of the players on the physical space and connecting real places to narratives and learning content able to transfer knowledge and actively promote health-related attitudes and behaviours, offer great potential in pursuing the learning objectives and narrative concept outlined in the PREHealth Conceptual Model.

The LBGs that will be developed in the framework of the "Health and Fitness Itineraries" (HFIs) designed in each of the participating cities during the adaptation of the project’s conceptual model and devised set of AR tools for use in different educational frameworks (i.e. higher education, secondary education, adult education and education of disadvantaged groups), will aim at connecting:

- physical locations,
- observations and information concerning these locations,
- personal experiences and
- learning content.

Indeed, the PREHealth games aim to build activities and define challenges along a linear route across blue and green locations of the city (specified as the HFIs) and connect these activities and challenges with specific locations along the route.

**The process of game-design and development**

The theme of the PREHealth games and the process of game design and development, structured in Stages and Steps, will follow the “PREHealth Game Template” presented in the PREHealth Conceptual Model.

There are, however, key points to be taken into account by participants during the process:

**Field trips**

Throughout the completion of your game design project you will have the opportunity to visit the Health and Fitness Itinerary in your city several times.

- Take advantage of a number of walking tours in the HFI in focus.

\(^{15}\)Lehmann, 2012.
• Observe the different spaces included in the itinerary (e.g. green spaces, parks, lakes, canals, pedestrian ways, cycling lanes etc.) and note the available infrastructure (e.g. street furniture, sports and resting facilities, ground cover material, etc.).

• Observe the current uses of the spaces included in the itinerary and the people who use them.

**Opportunities for physical exercise**

There are obvious opportunities to exercise along the itinerary, whether the activity takes place at a certain location (e.g. exercising at an outdoor gym) or along a part of the itinerary (e.g. running). However, there are also opportunities that need some imagination and creativity to be revealed, proposing alternative forms of physical exercise and/or social interaction, making use of the surroundings and/or some minimum equipment.

• Engage in creative thinking through a brainstorming session, using the observations you made during the field visits as a basis.

• Try to think of activities appropriate for a single person or a team

• Keep in mind the selected game theme

• Be prepared to test your ideas on the itinerary

**Game genres and narrative**

People sometimes feel demotivated to play the LBG alone or get easily bored when playing by themselves. A cooperative or competitive game between teams can provide a solution to this problem. For several locations along the HFI it might be practical to create games for solo players that enjoy going through the itinerary at their own pace and discovering the game. Learn about game types, ways to motivate the player and storytelling by examining video, street, traditional games and interactive storytelling experiences.

• Think about the players

• Choose solo games or team games

• Game mechanics can motivate players

**Game mechanics**

Think of all the simple but truly beautiful games you have experienced and you will understand that the fun in the game does not lie in its complexity. Think as a player when you design the game and avoid long texts and excessive information. Concentrate on the story and the message you want
to get through and try to use as few game mechanics as possible. Get inspired by the story itself and games that you love and create a new experience for your users.

- Simple is beautiful!
- Don't use many mechanics or too much text.
- Try to design an interactive and engaging or challenging system/game/story.
- An intriguing story by itself requires less game mechanics.

**Storyboarding**

Plan First, Play Later! Paper prototypes are an easy way to get feedback on multiple ideas. A script is always useful when trying to get a story through. Share your ideas with friends and classmates and check if it makes sense and keeps them interested before implementing your game.

- Prepare your plot by writing a scenario
- Use paper prototypes before digitally designing your game
- An easy way to get feedback on multiple ideas

**Implementation**

Use the tutorials, forums and contact details of the game-design platforms. Don’t be afraid to ask your team-mates and make mistakes. Remember that the platform is free and might contain bugs. Don’t lose heart! Creating a piece of software and debugging it, even in such a simple and user-friendly way, requires patience.

- Read the manuals and tutorials available.
- Use the support services available in the different game-design platforms and don’t hesitate to post your questions or comments in the platform fora or online communities where possible.

**Playtesting**

Playtesting is the most important phase of game design. This is where a game shows its potential and ideas are tested in action. Do not be afraid to fail. Fail fast and try to fix the problematic points or redesign. Run the game within its actual context on site if possible. Test out core mechanics before emulating the final game.

- Test the game in the actual environment
• Emulate the final game
• Test out core mechanics

Environment

The game you have to design has a significant feature that you cannot ignore: it is set in an urban environment and along a predefined itinerary. This will give you several extra parameters to take into consideration during the design process. A detailed overview of suitable environments for location based games (i.e. suitable in terms of players’ safety, play rhythm, social context, etc.) can be found here.\(^{16}\)

- Respect the character of the different spaces along your itinerary and their current uses
- Take into account any existing rules or conditions of the open areas (e.g. opening hours of parks, proximity to conflicting uses, quiet hours)
- Take safety issues into consideration
- Remember to integrate rules in your game design

Technology

Technology failure happens. You should keep in mind technology inefficiency and breakdowns. Be prepared for low-tech alternatives or game mechanics interventions to favour the game flow.

- Mind potential 3G coverage issues and GPS inaccuracy
- Be prepared for low-tech alternatives or game mechanics
- Software and hardware may break down- have a plan B and do not panic!

Enjoy your game design process

The most important part of the game process is to remember that it is supposed to be fun! Enjoy it!

Platforms for Location Based Game (LBG) design

In order to create a location-based (LBG) mobile game you have to make use of game-design platform. There are many free platforms available online, however in the framework of the PREHealth project three platforms have been selected as most suitable for implementing the PREHealth Conceptual Model:

ARIS   www.arisgames.org
Enigmapp  www.enigmapp.fr
TaleBlazer   www.taleblazer.org

Platforms include a mobile application, a web editor, and they also provide a server to store the data:

- The mobile application is used by the player in order to play the game. The player needs to download the application from the website of the platform or a digital distribution platform for mobile devices such as iTunes, the App Store for iOS or Google Play Store for Android operating system (OS).
- An editor is usually a web based interface that is used by the game-designer in order to create the game.
- A server is where all the information of the game is being stored and accessed.

Each of the proposed platforms has a different structure for their editors’ interface, however, there are many common characteristics among them:

- One of the core features in location-based games platforms is a dynamic map field. This is where a designer sets the action of the game by “pinning” the locations of the game components. When players of a location-based game approach the specified locations in the physical world, actions are triggered in the game, in the digital world.
- Games often incorporate different roles for the player. These roles can be either assigned or chosen by the player when such an option exists in the game scenario.
- An LBG player can interact with virtual characters – i.e. non-player characters (NPCs). The player can interact with them by having a conversation, by exchanging items or even gaining attributes such as fame, experience etc.
- Virtual items can be collected during a game in the player’s inventory. The items can be used as score indicators, they can often be “dropped” for another player to collect, and they can be traded with other items among players or even be taken out from the player’s inventory.
- Components that provide information are often incorporated in the game scenario. Information nodes can include text, audio, video or even online content.
- A game scenario may have plot twists and may depend on the player’s choices. The course of action can be set by adjusting the game components’ parameters of appearance on the game interface. A game designer can be compared to a director staging a play; the turn of appearance of each game component can be defined by a set or rules, decided by the designer in order for the narrative of the game to advance.
- Players should have a clear idea of what their objective is during the game. The players’ mission and progress can be clarified using various mechanics such as updating the players’ status, history or quests tabs. Moreover, the designer should provide the player with
an experience of closure, a reward or a word of encouragement to try again - depending on
the game’s genre - so that the game benefits from a clear ending. In some cases it is not
necessary to set an ending, for example in time-limited games, travel guides and more open
playful experiences.

This is a basic outline of some of the core features included in the design and development process
of location based games across platforms. As platforms have their own requirements in terms of
structure, use, terms and scope, it is suggested to game-designers to refer to manuals, tutorials
and documentation available by each provider before they start developing their games. In the
Inventory section below, you can find several ICT tools useful for gathering, editing, mapping,
geotagging and developing a PREHealth game.

ICT tools inventory

Sharing spaces for team work

You can use a sharing space for collecting the groups’ digital material online. Google Drive and
Dropbox could prove quite useful for putting all material together and sharing.

https://www.dropbox.com
https://drive.google.com

Working with digital media

You can find many on-line resources for digital media processing. Video editing and photo editing
tools can prove helpful for visualising the game contents.

https://popcorn.webmaker.org
http://pixlr.com/editor/

Working with mobile devices

Mobile applications can be very useful during the game design process. Taking pictures via a
mobile appliance can provide useful geolocation data and this can help you associate the
photographs with specific locations. Route tracking is also important for setting a location-based
game site. These processes are made very easy through mobile phone/tablet applications such as
the following:

- maps and navigation
- digital media association with geospatial data (geotagging)
- route mapping

(Click on the icons when using a handheld device)
**Game design platforms**

The game design platforms suggested (ARIS, Enigmapp, TaleBlazer) were selected on the basis of their free and unrestricted use, their availability in different operational systems of mobile devices (i.e. Android and iOS), the features they offer, the support or online community available, and their stability and ease of use. Out of the three platforms recommended for the PREHealth requirements, ARIS is regarded as the most elaborate and offering the most options for the design and development of a LBG, however its full range of features is still only available for IOs devices. Enigmapp is considered as the easiest to use out of the three, however offering only linear game designs. TaleBlazer lies somewhere in between, easy to set up and able to offer an elaborate AR experience if based on a grasping narrative.

**ARIS**  [www.arisgames.org](http://www.arisgames.org)

ARIS is an open-source, easy to use platform for creating and playing augmented reality experiences on iOS devices (primarily) and Android devices (beta version with limited features). These experiences include but are not limited to Interactive Stories, Scavenger Hunts, Tours, Data Collection Activities etc. Learning is at the core of ARIS applications, combining the benefits of game-based learning and situated learning.

ARIS is developed and supported by the Field Day Lab, a lab active in the development of educational games and digital learning resources within the University of Wisconsin in the USA, led by David Gagnon, the creator of ARIS.

The use of ARIS is related to educational purposes and spans from classrooms to museums, school clubs and community action groups. Although some of its advanced features require some degree of knowledge and practice, its friendly editor interface and the learning material and support available through online video or text tutorials and through an active online community, help users quickly get to speed with creating their own AR experiences.

The basic conceptual model for ARIS authoring involves **objects, triggers, and scenes**.

- Media content = **objects**
- How a player accesses content = **triggers**
- Organizational units for triggers = **scenes**
Objects and Triggers

Objects in ARIS are containers for the content you'd like your players to see and interact with. There are many types of object, but they are each a format of media. The text areas are actually html fields capable of executing arbitrary javascript as well. You can make these pretty fancy by looking up a few common html tags and how to use them. The media asset can typically be an image, video, or audio clip.

For the actual settings for each object see their pages:

- Plaque
- Item/Attribute
- Conversation
- Webpage
- Factory (a meta-object)

And for media specifications, look here.
You can create objects and see them in the left sidebar of the main (Scenes) tab of the Editor.

To make your object available to players, you must also create at least one trigger to point to that object. Each trigger lives in a scene.

**Triggers** are what connect the game world to the physical world and to itself. In a very basic sense, a trigger is how a player gets to an object. If you want a plaque at one specific place on earth, you would use a location trigger to point to that plaque, and move that trigger to the intended place. But that is just the beginning. There are many different types of triggers. Below, there is a basic description but for details see the [Trigger Types](#) page.

- **Location** (AKA GPS) - ARIS places a trigger at a location in the world using geospatial coordinates. A player can access the object pointed to by being close enough to this location.
- **QR code** - Players can scan an image to access an object in ARIS using their scanner (in ARIS). Alternatively, they can enter a corresponding string into their decoder.
- **Locks** - Internal game logic. Things that a player has done before, not yet done, their current state, or the state of their team or the game world as a whole (that’s a lot of options) alone can trigger further interactions. No action in the physical world is needed.
- **Timer** - A self-refreshing timer that triggers an object each time it counts down to 0.
- **Beacon** - Another form of location detection. Instead of GPS coordinates, this trigger works on player proximity to small devices called ibeacons or Bluetooth beacons.

**How to add triggers to scenes**

You add a trigger to a scene using the (+) button in the upper right corner of a scene. There are many types of triggers, each of which is an action in relation to a game object:

- Start Conversation
- View Plaque
- Inspect Item
- Visit webpage
- Switch scene
- Run event

More on the details for each of these basic types of trigger below, after notes on scenes.
What Are Scenes?

The Scenes tab is the main tab in the Editor. It is a visual interface to design stories in ARIS. It helps you organize your objects, quests, and moments of player interaction. Instead of a long list of objects, you can see the structure of your games and stories directly in this window. This should help authors think about the progression of their creations, right in ARIS.

Every game needs at least one scene. Every object needs at least one trigger to provide the player access. A trigger is created within a scene.

Objectively, scenes are containers for collections of game objects (plaques, conversations, etc.). But the metaphor is with cinema/theater. A scene is a basic organizational unit of design to help you think about the different parts of the story/game you’re making as separate productions that are linked together. A story will typically be made up of several connected scenes, and the branching connections between scenes could become quite complex if you want.

Scenes are about helping you to tell stories more efficiently using ARIS. They are likely more useful for larger, more important games. When you’re just getting started, it may be best to use a single scene, and simply add all your triggers to that.

How to Use Scenes

You create one or more scenes, and add triggers to these scenes to move action along within them. Every moment of the experience you’re creating for a player will take place within one of your scenes.

Every game needs at least one scene. Add a new one by clicking the big, “add scene” button when you are in the Scenes tab of the Editor.

- Scenes can be titled, and moved around within the main window of the editor.
- A player can only be in one scene at a time. Triggers in other scenes will not be available to players regardless of the locks you put on them. Scenes can be a convenient way to segment your games, but you need to learn how to use locks to move players in and out of scenes.

**Pro-tip:** Until you are indeed a pro, or have a real need, just use one scene for everything. Switching scenes is a bit tricky to set up and not immediately obvious to players so it is easy to break your game (and have a hard time seeing it) when you have multiple scenes.

Switching Scenes

One special type of trigger is the one you use to send the player to another scene. By default, the player starts in the first scene you create. You can change which scene is your first scene in game
settings. If you want them to see your objects whose triggers are in other scenes, you need to send them out of their initial scene and into another one. You do this with a switch scene trigger.

**The Three-Act Structure**

**ACT I**

**ACT II**

**ACT III**

- **SETUP**
  - introduction
  - rising action
  - stakes get higher

- **CONFRONTATION**
  - crisis

- **RESOLUTION**
  - falling action

- **Plot Point** (a major twist that provokes the beginning of a new act.)

*Using multiple scenes may help you organize your storytelling*

**Using Triggers**

Each trigger has many options for when and how the player can access it. You edit them by clicking on the trigger within the scene.

*A scene with a bunch of triggers. Notice the custom icons for each type of object.*

In the left sidebar, you will see the available options, grouped into three categories:

1. **Edit Object** - Details about what the player sees and does once they are looking at or using your object.
2. **Locks** - This replaces the former notion of requirements in ARIS. If you are familiar with requirements, this is the same, just with a better name. If not, Locks are what allow you to not have your objects show up at the same time for the player. You lock an object, and by doing certain things in the game, the player can unlock it.

3. **Trigger Type** - Various mechanisms for a player to actually go about getting to your object. It could be being in a specific place, scanning a QR code, etc.

**Edit Object**

The first section of buttons you’ll see is “edit item” (or edit plaque, etc.). Clicking on the button brings up a small window where you can change the media, text, etc. for the object itself.

**Locks**

Clicking on Locks brings up the Locks Editor, where the big plus button adds new locks. Locks prevent players from triggering objects. This is a powerful and intuitive approach to the AND’s and OR’s involved in logically connecting complex chains of game objects. You can read more about locks at the link below, but the short version is:

Grouped locks need to ALL be unlocked by the player to unlock the object, and satisfying ANY of the ungrouped locks will unlock the object.

[All about Locks](#)

**Trigger Type**

There are several ways that a player can gain access to the objects you create in ARIS. You can choose among them here.

- **Location** (AKA GPS) - ARIS places a trigger at a location in the world using geospatial coordinates. A player can access the object pointed to by being close enough to this location.

- **QR code** - Players can scan an image to access an object in ARIS using their scanner (in ARIS). Alternatively, they can enter a corresponding string into their decoder.
Locks - Internal game logic. Things that a player has done before, not yet done, their current state, or the state of their team or the game world as a whole (that’s a lot of options) alone can trigger further interactions. No action in the physical world is needed.

Timer - A self-refreshing timer that triggers an object each time it counts down to 0.

Beacon - Another form of location detection. Instead of GPS coordinates, this trigger works on player proximity to small devices called ibeacons or Bluetooth beacons.

Notice, you need to hit enter or click save after selecting any of the toggles to make them active. You will be able to tell which is active from the small blue icon next to the object’s icon in the scene window (place marker for location, mini QR code for QR code, chain link for sequence).

For details on how each type of trigger works, see the Trigger Types page.

Below you can find useful links for the help, training and documentation sections of ARIS:

- Training and Links: http://arisgames.org/make/training/
- Forum: https://groups.google.com/forum/#!forum/arisgames
Enigmapp is a platform developed by a French company, winner of the Réseau Entreprendre award, created by tourism professionals for tourism professionals. Its main focus being on tourism, the platform was built with the mission to encourage the design and development of AR location-based games (called courses) which enable visitors to discover different destinations, ranging from sites of cultural heritage to areas of natural beauty and urban neighbourhoods.

What it offers

The games offered by Enigmapp are based on a design concept that uses a linear narrative development and challenges the player on a quest. The player is encouraged through a narrative to navigate in the physical space and through the mobile device’s GPS interact with the game objects, i.e. either get information about certain aspects, interact with the game characters or overcome challenges in order to advance. The challenges can take the form of mini-games of various difficulty levels. These mini-games can either be:

- A question the player needs to answer correctly. The question can take the format of a:
  - Free answer question
  - Multiple choice question
  - Turning wheel
  - Text with gaps that the player needs to fill in
- A puzzle the player has to solve. Any image or photo can be turned into a puzzle easily through the platform.
- A clickable image that the player will be asked to place on a specific position on the map in order to advance. Any image or photo can be used.
- Geo-location. A question or taunt encourages the player to navigate to a specific location in order to solve the mini-game and advance.
- NFC – Near Field Communication.
- QR code. The player must locate and scan a QR code that will prompt him/her for a right answer.

Enigmapp also offers options for different visualisation themes, with backgrounds and characters appropriate for different course themes, e.g. heritage tour or tour in nature. The game content that can be uploaded by the game developer ranges from texts, images, sounds, videos and mini-games. The resulting games are freely available to potential players around the globe located within a maximum distance of 100 km from the game location. Players can either play the game on location ideally, or browse through it from their own location.

An advantage of Enigmapp is that it is available to both Android and iOS operating systems for mobile devices, offering in both cases the full range of features. Also, its initial focus being on tourism and aiming at encouraging tourism service providers or locals to develop a game themselves without any requirements for prior technical expertise or special knowledge on programming, makes it easy to get familiar with and use. In addition, the games developed can be
How to create a course (game)

The first step is creating an Enigmapp account at www.enigmapp.fr by filling in an e-mail address and a password. If the website appears in French, it is possible to translate it in English or any other language through your browser’s translator (e.g. in Google Chrome by selecting the translate tool on the right of the address bar).

Then, login and by selecting “My page / Courses” on the top right you navigate to your page where you can create a new course or edit an existing course of yours. For creating a new course you click on the plus sign (+) and enter the Editor. Depending on the course you want to create, you can give a personality to your creation by selecting a theme: adventure book, medieval atmosphere or museum guide and more. Will you have a narrator or not? What will it look like? You have a choice. If you aren’t happy with the existing proposed themes, you can create your own.

On the next step, you can create your game by adding your “Introduction” and different steps along the route you’ve selected. By dragging and dropping the pins corresponding to your different steps on the map, the route is created automatically. You can guide players on your own maps, decide whether to drive them inside a building or force them to navigate with a map of the sixteenth century.

At each step, write the text that your users will discover. Do you have a lot to say about a lot of topics? Add information sheets on the themes you want, accessible at any time to give additional information to those you guide without cluttering the main frame. You can easily add multimedia content like images, audio, videos to enrich the players’ experience.

Add mini-games to make the experience more fun: find a detail on an image, reconstruct a puzzle, decode an inscription, solve an enigma, etc. Indicate the difficulty of the mini-game so that it yields more or less points, give clues for those who would get stuck, and indicate what will be displayed in case of a correct answer.

Don’t forget to save your progress. At the end and after you’ve created all steps and inserted all content, you just have to publish your creation. In private mode so that the course is only available by invitation and you can test it or share it only with your friends, or in public mode so that the whole community has free access to it.

Overall, Enigmapp is an easy to use platform for creating location-based games with player-friendly interfaces and fun activities. Similar to the other two platforms presented here, it includes a web-based editor platform and an application for mobile devices, available for Android and iOS operating systems. However, it can only offer games based on a linear scenario development, i.e. following a linear sequence: The players are only taken from the game introduction to Step 1, Step 2 etc. until they reach the game epilogue. This characteristic is due to the fact the platform was created in...
order to build AR location-based visit tours. This means that, unlike the 2 other platforms, in Enigmapp the game designer cannot create different paths for the players according to their responses or performance in the game. This should be taken into account when selecting the LBG platform to use in the frame of the PREHealth activities.

Below you can find useful links for the help and documentation sections of Enigmapp:

- **Create**: [http://www.enigmapp.fr/index/maptrois](http://www.enigmapp.fr/index/maptrois)
- **Contact**: [http://www.enigmapp.fr/index/contact](http://www.enigmapp.fr/index/contact)
TaleBlazer is an augmented reality (AR) software platform for creating location-based games, developed by the MIT Scheller Teacher Education Program (STEP) lab in the USA. TaleBlazer was developed to allow users to play and make their own location-based mobile games.

TaleBlazer games take place in the real world. Players interact with virtual characters, objects, and data as they move around their real location. TaleBlazer games can be played on most GPS-enabled Android and iOS smartphones and tablets. Moreover, once a game is downloaded to your mobile device, you don't need an internet connection to play your games! Only your device's GPS.

TaleBlazer consists of four software components: an online game Editor which allows the designer to create/edit/save games, a game Repository server which stores the games, a multi-player server (currently under development) which maintains a shared game universe for multi-player games, and an installed mobile application which is used to play the games on iOS or Android devices.

The TaleBlazer editor is browser-based, with no local installation required. The TaleBlazer editor uses a visual blocks-based scripting language - which makes it easy to create rich interactivity, while helping users avoid syntax errors. Users create accounts allowing them to save game files to the cloud, which can then be downloaded directly to a player's smartphone. TaleBlazer game designers have instant access to TaleBlazer games from any computer attached to the Internet.

How to make a TaleBlazer game

To make a TaleBlazer game, the game designer specifies one or more regions – real-world locations where the game takes place. Then the game designer adds agents – representing items, characters, or whatever the designer wants – to the region. When the player's location comes close enough to the agent's location, the player is said to bump into the agent. When bumping an agent, the agent dashboard comes up by default, displaying the agent's name, description and image. The designer can also specify traits (variables) displayed as a list, and actions displayed as a row of buttons on the agent dashboard.

More functionality can be achieved by configuring scenarios and roles. Just as the player can interact with the agent via the agent dashboard, the player can also interact with the world dashboard, the player dashboard, and the team dashboard (coming soon to multi-player). Complex game mechanics can be specified by means of a blocks-based programming language.

The editor software is used by the game designer to create a TaleBlazer game. Across the top of the page are the tabs that organize the game content and the game control panel. Use the buttons in the control panel to Save or create a New Game. Note that TaleBlazer does not automatically save, so make sure to save your work. A drop-down from the game control panel allows the game designer to modify the name, image, and description of the game. These settings are visible on the game page when the player chooses to start playing the game.
The tabs separate the content into five areas, in more detail below.

**WORLD**

The world tab includes all the settings that are relevant to the entire game world:

**Mobile Tabs**

The game designer specifies which tabs are visible in the mobile software when the game is played:

- **Game** – displays meta information about the game itself such as the name, image, and description of the game, the game code, as well as a Leave Game button which closes the game and turns off the GPS.

- **World** – shows the world dashboard, including name, description, image, as well as world traits and actions.

- **Map** – shows the current location of the player as an icon on the game map along with the icons for the visible agents. If the player is close enough, as specified by the bump settings, the player can tap on agent icons to bump the agents.

- **Player** – shows the player dashboard, including the name, description, image, as well as player-specific traits and actions.

- **Clue Code** – here the player can enter a clue code which allows the player to interact with a clue code agent ‘anytime, anywhere’ – ie regardless of the player’s GPS location

- **Heads Up** – uses the compass and GPS readings of the device to show nearby agents as markers overlaid onto the video camera display. If the player is close enough, as specified by the bump settings, the player can tap on these markers to bump the agents.

- **Inventory** – shows the contents of the player’s inventory

- **History** – shows a list of agents that the player has previously encountered in the game

- **Log** – shows a list of all the things the player has done in the game.

- **Settings** – allows the designer to access debugging functionality such as turning ON tap to visit, and changing the bump radii

**Introduction**

The introduction comes up when the player first starts to play the game. The game designer can use the introduction to orient the player to the game in some way - set up the narrative, give the player a quest, or provide help on how to use the software or how to play this game.
Mobile Settings

Certain advanced settings for the mobile software can be found here. The game designer can specify which key pad is presented to the player for entering passwords and clue codes, and whether the player must enter a password to show the Settings tab. The TaleBlazer mobile software allows the player to turn on tap to bump via the Settings tab. Tap to bump allows the player to tap on the map icons to visit the agents regardless of the player’s location. This is important functionality for the game designer to be able to test their game when not on location. The experienced TaleBlazer mobile user can include the Settings tab for any game by tapping the Show settings checkbox in the About box (accessible by tapping the About button on the Game tab. Experienced game designers can protect this functionality by designating a password so that players cannot turn on the tap to bump setting unless they have the password.

Bump Settings

These game-wide settings allow the designer to control how hard or easy it is for a player to bump into an agent. The designer specifies:

- Whether bumping into an agent
  - shows the agent dashboard AND runs the bump script(s) OR
  - just runs the bump script
- How close the player must get to the agents in order to bump into them.
- Whether the agents can be re-bumped
  - How far the player must get from the agents in order to allow them to be re-bumped
  - By default, once an agent has been encountered, the player does not re-bump the same agent later in the game. If the re-bump option is checked, then agents can be re-bumped if the player leaves the immediate area and returns. This distance is enforced to prevent the agent from continuously popping up when the player is standing in one place.
- Whether the agent’s map icon is
  - Hidden on the map
  - Visible on the map
  - Only visible when the player is within a specified distance
- Whether the player can bump the agent by tapping on its map icon in the map view.
  - Regardless of how far the player is from the player
  - Only when the player is within a specified distance from the agent
- Whether the agent’s marker in the Heads Up View is
  - Hidden
  - Visible
  - Only visible when the player is within a specified distance
- Whether the player can bump the agent by tapping on its marker in the Heads Up View.
  - Regardless of how far the player is from the player
  - Only when the player is within a specified distance from the agent
**Scenarios**

Scenarios allow the game designer to specify different ‘versions’ of the same game that the players can pick from when they start the game. For example, the player might be asked to pick between ‘Easy’ and ‘Hard’ or between ‘Short’ and ‘Long’ or even ‘Start at Main Entrance’ and ‘Start at Side Entrance’.

**Actions**

Actions appear as buttons on a dashboard. Actions can be:

- **Text** – displays rich formatted text
- **Video** – plays an uploaded video or (under development) a YouTube video
- **Built-in** – performs built-in functionality, such as the pick up and drop actions.
- **Script** – executes a designer created script. See the section on Scripting later in this document.

The name, type, contents, and visibility of an action can be changed in the Editor via the relevant Actions box. The name of the action appears as the text on the action button. The visibility of the action determines whether the button will be visible to the player on the relevant dashboard. The designer can also specify the sort order of the buttons across the dashboard. The visibility of an action can also be changed at run-time (during game play) by means of the blocks-based programming language.

**Traits**

Traits are variables that the game designer can specify for agents, roles (ie players), teams, and for the world itself. The game designer declares and initializes a trait by pressing the Add Trait button and then using the trait dialog to add a trait to the given object (agent, role, team, world). When adding a trait, the designer specifies the name, the initial value, and the initial visibility of the trait. The visibility of the trait determines whether it will be visible to the player on the relevant dashboard. The name, value, and visibility of a trait can be changed in the Editor via the relevant Traits box, as well as the sort order of the traits. The value and visibility of a trait can also be changed at run-time (during game play) by means of the blocks-based programming language. When creating a new trait the designer must also specify the following attributes of the trait that cannot later be modified:

- **Scope** – which object(s) can use this trait (not applicable to world traits since there is only one world)
  - Common for all objects of the same type (agent, role, or team)
  - Only for the current object (agent, role, or team)

World traits are global settings shared by all players in a game. For example, the designer can use a world trait to specify and display the current temperature in the virtual world etc. All player traits
should be created as common traits. This will allow maximum flexibility in accessing the traits from all scripts in the game.

**MAP**

On this tab, the game designer specifies a location in the real world where the game will take place. In order to play the game, the player needs to physically be in this location. The TaleBlazer Map tab shows a Google Maps view of the world which can be searched via a search bar. The designer can pan and zoom this view, and then can use the Move Game To Here button to move the game boundaries to the area visible in the map view. Alternatively, the designer can change the game boundaries by clicking and dragging on the blue square markers in the map view or by typing new latitude/longitude values for the boundaries in the property box on the left side of the screen. To prevent the unwary designer from accidentally changing the game boundaries, the map is locked by default once the boundaries have been set. To change the boundaries of the game at any time after this point, unlock the map by unchecking the Lock Map checkbox.

The agents are visible in the map view as map icons. The game designer can edit the agents by clicking on them or (if the Lock Agents checkbox is unchecked) can move them by dragging. To keep the agents in their real world location and tweak the boundaries of the map – perhaps to include a larger or smaller area or to move the map slightly – use the Preserve Agents’ Lat/Lng setting. To move the entire map to a new place, use the Preserve Agents’ X/Y setting. The game designer may also want to specify more complex map features:

*Custom Map:* By default the mobile software uses the Google Maps API to display the player’s position in the real world during the game. This API requires the player to remain within Wi-Fi or cell tower coverage to display the game map properly because the map is updated dynamically during game play as the player moves about the real world. In order to create a game that can be played without a data plan or in an area with poor Wi-Fi and cell tower coverage, the designer can upload a custom map – a jpg or png file which is displayed on the background during game play in lieu of the Google Map. A custom map can also be used to show custom details on the map during game play, such as pedestrian paths, parks and open spaces, enhanced color, historical or geographic data, or even a fictional landscape.

**AGENTS**

The game designer creates agents in a region and gives each agent a name, description, and image. The designer can also specify the agent’s icon, which is displayed when the agent is visible on the map tab and alongside the agent’s name in other places in the mobile software.

Settings for Agents:
Clue Codes

Agents can be configured to be located as a clue code instead of at a coordinate in a specific region. A clue code agent is bumped when the player types in the correct clue code on the clue code tab. The game designer can use clue codes to implement the same functionality as an audio tour in a museum in which the player searches for signage and then types in a number. Clue code agents can be accessed anytime, anywhere.

Password Protection

The designer can opt to password protect the dashboard so that the player must enter a password in order to see the traits and actions on the agent’s dashboard.

Excluded Agents

Excluded agents are inert and inaccessible by the player. When an agent is excluded, players cannot see the agent, bump the agent, or interact with it. An excluded agent, however, can be referenced by the scripting language. The traits of an excluded agent can still be accessed and/or changed via scripting. An excluded agent can be included via the include agent block; likewise, an included agent can be excluded via the exclude agent block.

Bumping Agents

When the player encounters or meets an agent in the TaleBlazer software it is called bumping the agent. Bumping an agent can happen in one of five ways:

1. GPS proximity - when the player is “close enough” to the location of the agent
2. Map icon tap – when the player taps on the agent’s map icon in the Map view
3. Heads Up tap – when the player taps on the agent marker in the Heads Up tab
4. Inventory tap – when the player taps on an agent in their inventory tab
5. Clue Code - when the player enters the correct clue code (for ‘clue code’ agents only) on the clue code tab.

When the player bumps the agent, the agent dashboard pops up by default, showing the agent’s name, description, image, and visible traits and actions.
Once finished designing the game

Name your game so you will be able to identify it again easily. Then click the Save Game button. On the mobile device, find the game either by logging into your account and tapping on it in the My Games area or by entering the game code. Once you have found your game, tap on the Download and Play button. To invite others to play your game, give them the game code.

Below you can find a useful link for the documentation section of TaleBlazer:

- Documentation: [http://taleblazer.org/Support/documentation](http://taleblazer.org/Support/documentation)
Learning course programme
Cooperative design and development of games for mobile devices in order to promote physical activity in urban spaces

Proposal for incorporating the learning course in the formal secondary education framework

The learning course: Cooperative design and development of Location-Based Games (LBGs) and interactive AR applications for mobile devices (mobile phones and tablets) by students in order to promote the physical activity of users in urban public open spaces along a selected Itinerary.

The approach: Team-Cooperative interdisciplinary approach.

Implementation range:

Environmental education - Introduction to the local environment (physical, social, economic). Correlation of the Built/Artificial Environment with Quality of Life. Urban environment, public space, mapping, orientation, human geography of the city.

Information and Communication Technology - Introduction to applications for sharing (Google Drive), communication (e-mail), and office applications (word processing, presentation software). Use of mobile devices applications (camera, maps, geo-locating photos). Use of platform for designing location-based games.


Health education - Physical exercise and health, free time.

Extensions: The course’s range can be extended to creating original visual artwork, processing image and video, creative writing, scenario development, development of characters and dialogues, depending on the expertise and interests of the participating trainers.

The games: They are developed cooperatively in teams, guided by the trainers.

Target groups: Teachers and students of secondary education, 14-17 years old (depending on the learning framework).

Implementation framework: Groups of Experimental Schools, Environmental Education, Research work (project), etc.

Duration: 30 didactical hours in class and 9-12 hours of fieldwork.
**Course Objectives**

**General Objectives for students:** To understand the relationship / interaction with the urban environment (natural, built and social) To develop a research mentality, as well as critical and creative thinking about the use of public spaces and the promotion of health and physical exercise in them. To exercise in team work. To develop a spirit of co-operation and responsibility.

**Learning Objectives:**

**Knowledge**

The students, upon completing the course, will be able to:

- Identify the structural elements of public space.
- Organize the material they collect in the field.
- Select appropriate apps for collecting and editing material for game content.

**Skills**

The students, upon completing the course, will be able to:

- Research, collect and analyze data, and to carry out assessment and synthesis work through exploring the issue of exercise in the public spaces.
- Draw information about the public space through field and desk research and relate these to the content of the game storytelling.
- Build a simple scenario for a Location-Based Game.
- Designing a digital game for mobile devices using ICT tools.

**Stances/behaviours**

The students, upon completing the course, will be able to:

- Discuss, collaborate and participate in creative processes, and develop a respect for different views.
- Raise their awareness on the issue of health and physical exercise in the city.
- Adopt good practices with regard to the use of mobile devices.
- Encourage the public to actively use the urban public space and thus to improve it.
- Propose solutions to improve the urban open space, develop green spaces and promote opportunities for physical exercise.

**Specific course objectives:** In the course framework, students will develop a Location-Based Game for mobile devices, aiming at promoting physical exercise in the urban open spaces.

Regarding the learning process, the aim is for the students to:

- Develop their self-motivation through discovery/exploratory learning. μέσω της ανακαλυπτικής - διερευνητικής μάθησης.
- Exercise their creative imagination through games-based learning techniques and design thinking.
- Develop collaborative learning skills in the project approach.
Regarding the use of digital technology, the aim is for the students to:

- Develop digital literacy skills in the framework of developing games for mobile devices.
- Develop skills related to the research, selection, analysis and management of information.
- Develop fluency in the use of mobile devices, effectively using GIS applications.

**Learners profile**

- **Cognitive**: Students don’t need to have a cognitive background in relation to the theme. They have knowledge on the use of computers and mobile devices and this is enough to familiarize themselves with the tools and software used in the learning process.
- **Psychosocial**: The concept of healthy lifestyle and the integration of physical exercise in everyday life is a particular concern for modern society. The use of public space is considered an everyday practice so learners have already developed concepts about the concept. However, learners may also have misconceptions about the use of public places and exercise in them.
- **Age and gender**: This specific course is targeted at students of both genders, aged 14-17 years old.
Necessary equipment

In the classroom:
- Computers with internet connection.
- Projector.
- Mobile devices (smartphones, tablets) with internet connection.
- Note stickers - coloured cardboards.

On the field:
- Mobile devices (smartphones, tablets) with internet connection.
- Cameras - camcorders (optional).
- GPS devices (optional).
- Audio recording devices (optional).
**Course structure**

*The proposed structure can be adapted to the needs and the available time of the student group implementing the Program. The sessions foreseen are 15 meetings of 2 teaching hours each, of which 3 are field visits (longer than classroom sessions). The distribution of educational content is indicative.*

<table>
<thead>
<tr>
<th>Stage 0</th>
<th>Selection of the school and implementation framework of the project “PREHealth Health and Fitness Itinerary”</th>
<th>Meeting between the interested teachers, the school director and representative of the PREHealth project. Presentation of the course programme, the objectives and the course theme. Preparation of any necessary applications for the course approval. Selection of assessment methodology and tools.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The “start-up” phase of the program concerns only adult participating trainers, organizers and experts participating in the program. The purpose of the meetings is to inform the participating teachers about the field and the individual objectives of the action, to agree on the project’s action plan, and to identify the software to be used in the courses. Upon completion of this phase, the participating teachers will have completed a mobile location-based game that they will demonstrate and play with students at school as an example.</td>
<td></td>
</tr>
</tbody>
</table>
## Stage 1

The next stage of the programme begins with the creation of the training group and any subgroups (if necessary, depending on the number of participants).

Learners engage in a first hands-on contact with location-based games and are introduced to their potential through their hands-on gaming experience in real space and digital collaboration. A special objective of this activity is for learners to recognize the potential of a digital experience in real space.

The group then focuses on analysing an area familiar to them, as a first contact with the analysis of urban space. The objective of this activity is the gradual

<table>
<thead>
<tr>
<th>Preparation and organization of learners (2 sessions)</th>
<th>Presentation of the project and the “Health and Fitness Itinerary”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Presentation of existing Location-Based Games, introduction to similar games.</strong></td>
<td><strong>Experience of a LBG in the school area. Introduction to relative software.</strong></td>
</tr>
<tr>
<td><strong>Experience of a LBG in the school area. Introduction to relative software.</strong></td>
<td><strong>Physical and Digital creation of working groups: Creation of e-mails and wider working group through file-sharing arrangements. Selection of mobile devices to be used.</strong></td>
</tr>
<tr>
<td><strong>Introduction to Siftr.</strong></td>
<td><strong>“Hacking” games and sports for the urban open space: Making new games by modifying the already known games through changing the rules, the framework, mixing elements from different types of games or sports, using different media, using the equipment found in urban spaces.</strong></td>
</tr>
<tr>
<td><strong>E.g. monopoly, football, tennis, etc.</strong></td>
<td><strong>Material from Seminar A</strong></td>
</tr>
<tr>
<td><strong>Games, sports and athletes. Selection and research regarding the rules, scoring, winning, necessary equipment (How is it played and where? Who wins and how? What is allowed and what is not?) Research on stories and careers of athletes and Olympians.</strong></td>
<td></td>
</tr>
</tbody>
</table>
**Stage 2**

The objective of this Stage is for students to organize and discuss the material gathered with the appropriate tools, to learn about the digital tools for recording the route and to correspond digital inspiration material.

**Work in the classroom**

(1 session)

- Discussion about the field visit experience and the worksheets.
- Printing of the area map and identifying points of interest.
- Area analysis in relation to the field visit findings (blue, grey, brown and green zones). Landmarks, inspiration elements, persons and sensations.

- **Storing and sorting** - organizing the digital material.
- **Introduction to the digital maps and their features** – potential.

**Filling in the Worksheets.**

*Worksheet B template in Annex 1*
discuss about the material gathered with the appropriate tools, to learn about the digital tools for recording the route and to correspond digital material to actions on points of interest

<table>
<thead>
<tr>
<th>Stage 3</th>
<th>Introduction to the design platforms</th>
<th>Basic structural elements of game design. Aim, rules, scoring. Examples.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preparation for the scenario development (1 session)</td>
<td>Location-Based Games: narrative, storyline, characters, dialogues, mechanics, winning.</td>
</tr>
<tr>
<td></td>
<td>Game structure in the design platforms</td>
<td>Introduction to game development platforms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brainstorming for the game scenario using note stickers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Creative writing games in teams.</td>
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<tr>
<td></td>
<td></td>
<td>Putting the ideas in order and selecting roles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Creation of subgroups.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Storing and sorting-organising the digital material.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Introduction to the digital maps and their features – potential.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Allocating parts of the itinerary and corresponding the digital material to these parts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Google maps, Siftr and integration of content and digital material.</td>
</tr>
</tbody>
</table>
| Stage 4 | Scenario development | Game plan document.  
|         | (1 session)          | Shared working folders amongst the team members.  
|         |                      | Introduction of media like audio, image, video.  
|         | Game structure and   | Text processing.  
|         | content              | Image processing.  
|         | Game plan document.  | Siftr, Geotagging, recording the itinerary. Installing the necessary applications to the mobile devices. Testing on the school yard and allocation of roles for their use during the second field visit.  
|         | (1 session)          | Interim presentation of the draft scenario.  

| depending on the story, and the characters that may be appear in the game. | Multiple choice.  
| (1 session) | Mini-games.  
| | Missions / quests.  
| |  
| Game structure and content |  
| Digital applications on mobile devices for mapping. |  
| (1 session) |  
| Game plan document. |  
| Shared working folders amongst the team members. |  
| Introduction of media like audio, image, video. |  
| Text processing. |  
| Image processing. |  
| Siftr, Geotagging, recording the itinerary. Installing the necessary applications to the mobile devices. Testing on the school yard and allocation of roles for their use during the second field visit. |  
| Interim presentation of the draft scenario. |  

**Stage 4**  
This stage is at the core of game development, has the greatest organizational significance and is allocated more time in the course programme. The objective is to place the original material inspired by the story, and the characters that may be appear in the game.
### Stage 5

The purpose of this Stage is to practically test the game, to identify problems that may arise in the physical space and to regulate its parameters in order to have a better flow.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st Playtesting visit</strong></td>
<td>Playtesting on the field. Timing, mechanics, motive, environment, obstacles (natural obstacles, obstacles in the built environment, technological obstacles, the human factor).</td>
</tr>
<tr>
<td><strong>Game adaptation</strong></td>
<td>Adapting the content. Adaptation of core game elements, changes in the mechanics and/or the ways of interaction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field visit for mapping</strong></td>
<td>Collecting material in relation to specific places and mapping on the spot using digital tools. Testing the scenario on the field (obstacles, potential, opportunities, problems).</td>
</tr>
<tr>
<td><strong>Game development in the selected platform</strong></td>
<td>Content development: text, imaging, video. Developing the core elements of the game on the game development platform: characters, texts, missions. Remote testing in the classroom and solving problems through re-designing and modifications. (Proposed duration: 8-12 didactic hours)</td>
</tr>
</tbody>
</table>

**Seminar B by PRISMA, attended by the participating trainers/teachers (2 hours). Themes: Game development, answering questions and problem solving, Playtesting.**
<table>
<thead>
<tr>
<th>Stage 6</th>
<th>Presentation and assessment (1 session)</th>
</tr>
</thead>
</table>
| The objective of this Stage is to communicate pupils’ work to the local community in order to promote the game to the public. | Introducing new or taking away core game elements. 
Adaptation to the specific place characteristics as these are documented after the visit. 
Remote testing in the classroom and problem solving through re-design and modifications. 
Assessment by the players of the game experience through evaluation questionnaires, interviews. |
| | Fine-tuning the game according to the assessment findings, collecting visual material from the game environment. 
Creation of a presentation / finalizing the activities log. 
Updating the evaluation tools: Review of experience and reflection regarding the process. Registering proposals and experiences, feedback. |
| | Final presentation of the game in the framework of the project PREHealth. Event on the field, where the game will be played by local residents, the general public, project stakeholders. |
Annex 1

Worksheet for documenting original games and activities that promote physical exercise and wellbeing in the selected Health and Fitness Itinerary.

Design an original game

Name of your game

Inspiration
What game or sport did you “hack”?

Number of players or teams
How many players can play at a given time?

Space / Time
Where can it be played? Indoors or outdoors? On a green space or blue space? How long does it take to play?

Materials / equipment
What is needed in terms of equipment or materials to play the game?

Aim of the game
What does the player have to accomplish to win?

Rules
What is allowed to the player?
What is not allowed?