

AARLENS Digital Application for People with Autism Spectrum Disorders (ASD)

The AARLENS initiative was led by the Integra Foundation in close collaboration with ASTRADE, association to provide care for people with Autism and Developmental Disorders in the Region of Murcia, with the goal of **improving the quality of life of people with Autism Spectrum Disorders (ASD)** through the use of new technologies.

Through the use of an application for mobile devices, the initiative aims to reconcile the real world around us with the 'altered' reality that individuals on the spectrum face. Given the currently admitted rate of diagnosis of autism in Spain is approximately 1 case for every 100 births, this objective takes on increasing importance. This high rate of incidence highlights the need to focus greater developmental and innovation efforts on actions that facilitate real social adaptation and inclusion for this group.

To this end, and **considering that individuals with ASD, especially the younger individuals this intervention targets, generally have a good command of mobile devices such as tablets and smart phones, this project focused on developing an application (app)** to provide people on the spectrum with appropriate tools for the needs they face in their daily lives, e.g. at school and with family. Subsequently, the focus was on promoting the app among the various groups that deal with these individuals on a daily basis: associations, special education centers, etc.

People with ASD suffer from impairments in a series of different aspects or dimensions, including skills related to anticipation, and mental and behavioral flexibility. In this sense, children and individuals with this condition are characterized by rigid thinking or the tendency to establish routines, that is to say, activities are constantly repeated at school or home.

For this reason, the main tool created for the app is a **Digital planner** where **Form teachers or tutors** can quickly and dynamically **organize the routine activities of their students on the spectrum**, which avoids the labor-intensive nature and huge volume of supplies required to perform this task physically using notebooks and removable pictograms (symbols or drawings that represent ideas, objects or actions) made from cardboard. In this fashion, as many different planners as are needed can be created and modified in real time for a single user or a group of users, meeting their need to plan their activities by establishing routines while making actions, places, and people known ahead of time.



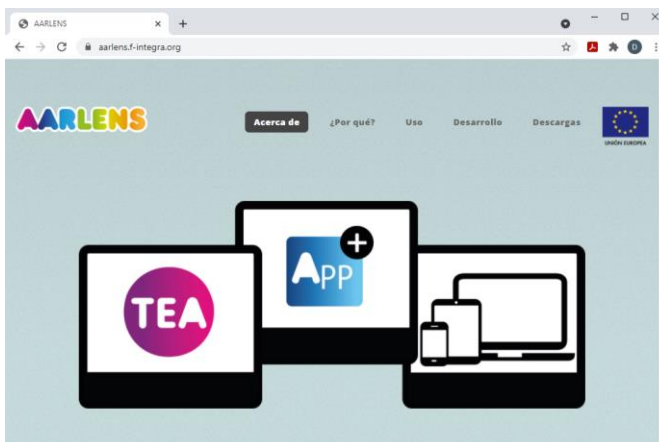
Visual aids are a great resource to this end, and an **extensive archive of pictograms is available through the app to help depict the different activities** that form part of the student's routine. A reward system is also available to motivate the user as they complete planned activities, since motivation and positive reinforcement through rewards is also particularly useful for day-to-day tasks for this group.

The investment for the development of this application and for training activities and promotion of the app totals **€62,482** to date including 80% (€49,986) co-financing with funds from the **ERDF 2014–2020 Operational Program**. The key result from this action has been the total number of downloads and users of the app: 820 to date.

It is considered a Good Practice because it meets the following criteria:

1. The action was properly distributed and promoted among the stakeholders, potential users and the general public.

Web page dedicated to the project:
<https://aarlens.f-integra.org/>



Promotional video: <https://vimeo.com/274354636>



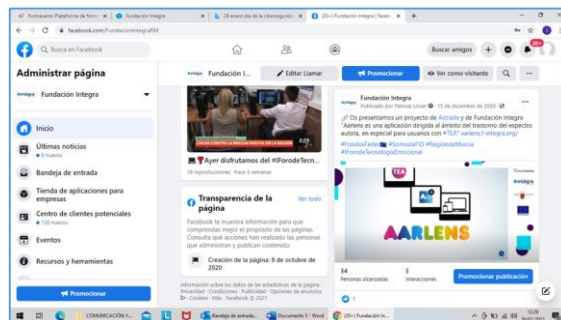
Promotional leaflet:



Wall sign:



Promotion on social media networks:



RegMurcia 4.0 Radio Campaign with actions from Integra Foundation:

<https://www.f-integra.org/servlet/s.SI?METHOD=DETALLEMEDIATECA&serv=Mediateca&mId=16463>



Presentation at the XIX National Conference AETAPI (Spanish Association for Autism Professionals)



Presentation at the First "Emotional Technology" digital Forum



Training workshops for ASD specialist teachers and tutors



2. The action incorporates innovative features.



Some of the pictograms used by AARLENS

This action arose by request from ASTRADE, the most important association providing care for people on the spectrum in the Region of Murcia, and from continual contact with similar associations across Spain because there were no free tools available in the market to help people with ASD to manage the tasks they have to face daily, as this has typically been accomplished using paper notebooks with pictograms.

For this reason, the AARLENS app, itself, is a completely innovative development that solves a specific problem through the use of new technology. The app can be downloaded for free on Apple and Android platforms, allows for the creation of planners with tasks and sub-tasks, as well as the use of an online database with thousands of pictograms. The planner can also be changed or updated in real time, assigned to a group of users simultaneously, and shared with tutors or family members. Moreover, specific

rewards can be assigned to each user for the completion of tasks, and pictograms can be scanned to create tutorials or instructions on how to perform tasks or handle an object.

Additionally, a simple augmented reality experience using 3D objects is currently in pilot testing. This function allows users to add virtual objects to the image seen through the device's camera so the person on the spectrum can become familiarized with objects and tools that professionals use (the pilot test includes three objects from a dentist's office), to try to help them envisage situations they will have to face in the future.

3. The results obtained align with the established objectives.

The key objectives of this action were: 1) equip users dealing with ASD and their tutors (educators and family) with free, stable, and innovative tools that aim to improve their quality of life and address situations in their everyday lives, and 2) promote this initiative and train potential users in the Region of Murcia on how to properly use the AARLENS app in their daily lives.

The first objective has been achieved due to the fact that all of the tools and functionality of the app, as well as subsequent improvements, have been created **taking the suggestions and continual testing of tutors and educators that deal with people on the spectrum every day into consideration**, insuring that all of the tools developed meet their precise needs.

The second objective was achieved, in large part, through 23 practical workshops carried out in various locations in the region that were **attended by 450 teachers and educators from Special Education Centers and associations from the field of autism**. These workshops provided professionals with the skills and knowledge necessary to adequately use the app in their daily activities with people on the spectrum. Moreover, significant feedback was received regarding personalizing and improving the app to make it simpler and more effective.



The development of this application and its promotion met a need, in an innovative and efficient manner, that was initially identified by a specific association, although it was immediately applicable to all the regional associations that choose to take advantage of it.

4. It contributes to solving a regional problem or weakness.

In the Region of Murcia, approximately 150 people are born each year with varying degrees of ASD who face serious limitations when performing the most basic daily tasks. Helping these individuals, whether at specialized centers or at home, requires working on important aspects such as anticipation and motivation; the former helps them to plan a daily routine and the latter helps to reinforce it through a system of rewards.

As a result, substituting cumbersome notebooks and cardboard pictograms with an **online app that can quickly and dynamically** organize the daily routines of people on the spectrum represents a huge step forward in the improvement of their quality of life. Furthermore, the problem this initiative attempts to solve is not just a regional problem, but it goes deeper in the absence of free, quality mobile applications based on the legitimate, daily needs and problems that users with ASD and their tutors face. It is for this reason that tutors and caretakers that deal with this group on a daily basis participated in the design of the app.

5. It applies to a high percentage of the targeted population.

There are six main associations in the Region of Murcia that work in the field of autism, and practical workshops on the app were conducted at four of them. Likewise, practical workshops were also conducted at seven of the twelve Special Education Centers under the jurisdiction of the regional Ministry of Education.

The challenge over the coming months is to reach 100% of the associations and Special Education Centers in the Region of Murcia, as well as to organize workshops targeting family members in order to extend the use of the app outside the classroom and into the home.

6. The horizontal criteria of equal opportunities and environmental sustainability were taken into consideration.

Although studies indicate that Autism Spectrum Disorders occur almost four times more frequently in males than females, the use of this app does not discriminate against any group or individual with ASD.

Likewise, the shift to digital technologies, as is the case with the present app, for activities that are typically performed using paper notebooks with cardboard pictograms results not only in time savings in the preparation of materials, but also in the elimination of these supplies which has a favorable impact on environmental sustainability.

7. Synergy with other policy or public intervention instruments.

Through Special Education Centers, in this initiative synergies with the regional Ministry of Education's policy for attention to diversity were achieved regarding students with permanent special education needs stemming from autism and other generalized developmental disorders, as their schooling requires constant and individualized help and significant adaptations that can't be taken care of in the ordinary classroom setting.