COACHILD: e-Coach application for the prevention of Children Obesity
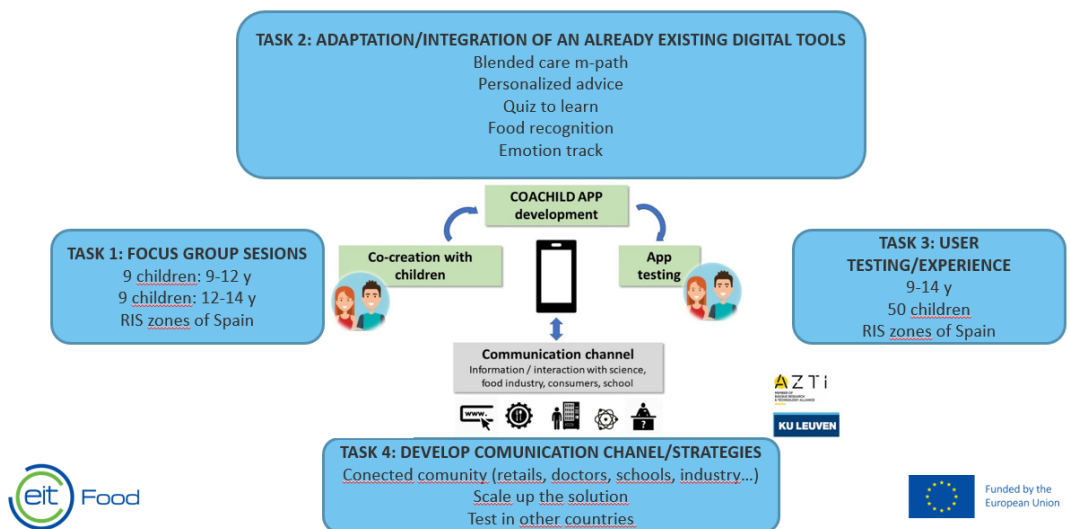
Project framework

Children spend most of their time at school, at home or within their community. While school and community may promote a healthy lifestyle, it is the parent-child interaction that plays a crucial role in the development of healthy habits. Children of parents with lower education levels have a higher risk of developing obesity because their progenitors may not perceive obesity as problematic and may lack themselves food literacy. On the other hand, socio-economic constraints may also lead families with lower incomes to preferentially purchase unhealthy food items (e.g. foods rich in fat and sugar), because they perceive healthier foods as less affordable than unhealthy foods. An important consequence of these limiting factors is that socially disadvantaged children may not develop the habits associated with a healthy lifestyle due to a lack of stimuli and behavioral incentives. In addition, **there is a lack of motivation and great disinformation associated with healthy dietary habits during infancy**. There is a high need for the young population to follow a healthy diet adapted to their needs, preferences, and lifestyle. Additionally, there is a lack of personalized strategies focused on young population with the aim of motivating them and to provide precise information about which type of food and physical activity is more appropriate to their profile and motivations. Despite action at the European level to reverse the rising trend in overweight and obesity, the proportion of children who are overweight or obese remains worryingly high.

Solution

There are many mobile applications for children to improve their literacy on healthy diet. However, few of these mobile apps have been designed according to needs and preferences of children or families. Most of these apps don't integrate personalized recommendations and it is not possible to measure the degree of learning or the impact that these recommendations have on children. **A new mobile application (e-coach) called COACHILD has been created as the communication channel to help and enable children to improve their food literacy and make better food choices to reduce the obesity risk.**

Methodology

AZTI in collaboration with KU Leuven and Grupo AN have developed a mobile application prototype to address in a proof of concept (PoC) the factors that increase the risk for obesity in vulnerable and socially disadvantaged children living in European regions with high prevalence of childhood obesity, in particular Spain (RIS country). For that purpose, we have explored in focus groups sessions, the consumer's aspirations, motivations, needs, drivers and barriers to make better choices regarding nutrition. During this PoC, the mobile application has been tested as a communication channel to engage children in action with the intention they achieve specific outcomes by goal settings through positive reinforcement and self-monitoring.

TASK 2: ADAPTATION/INTEGRATION OF AN ALREADY EXISTING DIGITAL TOOLS
Blended care m-path
Personalized advice
Quiz to learn
Food recognition
Emotion track

COACHILD APP development

Co-creation with children

App testing

TASK 1: FOCUS GROUP SESIONS
9 children: 9-12 y
9 children: 12-14 y
RIS zones of Spain

TASK 3: USER TESTING/EXPERIENCE
9-14 y
50 children
RIS zones of Spain

Communication channel
Information / interaction with science, food industry, consumers, school

TASK 4: DEVELOP COMUNICATION CHANEL/STRATEGIES
Conected comunity (retails, doctors, schools, industry...)
Scale up the solution
Test in other countries

Funded by the European Union

Results of the focus group

Three focus group sessions were conducted with 14 children aged 9 to 14. The focus groups were designed to gather information to guide the development of a mobile application through which users would increase their literacy on food and eating habits.

Results revealed that children are interested in **learning more about topics related to health and food habits**. Nonetheless, using technologies to transfer this knowledge is a challenge, as there is a clear dissociation between the content and the environment proposed. Children **do not use technology to learn about health and food habits**, as these contents are linked to school and formal learning environments.

The final insight we obtained from the focus group revealed the technical areas where further development would be needed to get a game that matched the children's requirements. These are **design and usability, gamification, game modes and social component.**

App´s functionality

The new functionality that has been developed within this PoC is a set of quizzes with an award system. Each quiz is about a specific food or nutritional aspect containing 3 or 4 questions.

Each time a quiz is answered correctly children receive an award, the picture of a cartoon monster, with the possibility of achieving a collection of them. On the contrary, if children do not pass a questionnaire, they receive a little tip for trying again and getting the reward.

This feature pretends to achieve the feeling of a competition game and engage children; therefore, this fact enables to achieve the global aim of the app, increasing healthy food and nutrition literacy. All questionnaires can be repeated as many times as desired, regardless they are passed or pending, making all the resources available to be consulted.

Testing results

57 users aged 10-13 have been involved in the testing phase of the COACHILD app. This session was planned to consider the insights obtained in the focus group sessions. Using well known user experience tools such as card-sorting, participants shared their expected functionalities as well as grouped multiple potential contents in groups, facilitating future sub-categories within the app.

Results concluded that **children prioritize 4 key functionalities** in any app (game-oriented) that has to be developed. This are: **being able to play without Wi-Fi**, **playing with friends online, having multiple difficulty levels and being able to learn and play simultaneously**. Thus, we observed a strong need of being able to interact while having a convenient environment. Content-wise, participants reported knowing most of the contents included in the game. Nonetheless, when analysing the usability session, we detected some gaps in knowledge. For future updates, there are **4 main areas of knowledge where participants would consider grouping the information included in the game: diet, health, nutrients and habits.**
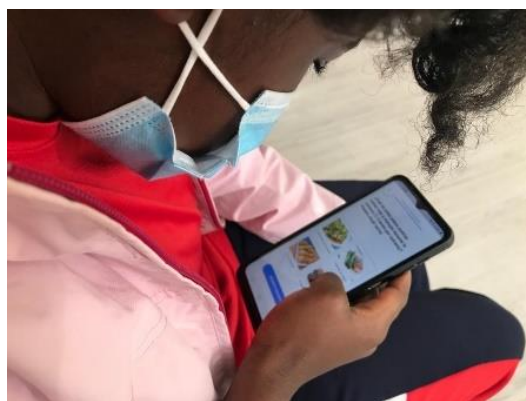
The system usability scale showed that our system does have a good usability, but with room for improvement, especially in the complexity of the in-game questions and the routes.

Finally, we also considered the answers of participants within the game and identified the easiest and most difficult minigames, as well as the engagement in each of them. Minigames focused on improve knowledge about **nutrients and consumption behavior** obtained the lowest rate of correct answers. Thus, fewer users obtained the rewards in these minigames. In a future update, these minigame should be modified, either by modifying the difficulty of the game or changing the way some questions are asked.

When asked if the game allowed them to learn new things about food and habits, over 80% of the participants responded affirmatively.

Conclusions

This PoC let to identify the interests and barriers that children have to improve their knowledge about nutritional aspects and the mobile app COACHILD prototype developed in this PoC served as a digital channel to test with children that gamification and positive reinforcement for self-monitoring engages this target population. Moreover, participants reported learning new things, the main goal of the project. Further development should tackle new functionalities and balance the complexity of the in-game questions.

Next steps / challenges

Future developments will be focused **on nutritional engagement programs in which digital tools as COACHILD app will serve as communication channel for children's self-monitoring but at the same time this app solutions will connect young people with their environment** (other users, market, food providers, school, health care professionals) to provide multiple resources because of the importance of blended and personalized care.

This e-coach will serve as a communication channel to engage children in action with the intention of them achieving specific outcomes (self-determination and goal setting) that responds to their needs and motivations. **The program integrating COACHILD app could be implemented in future years in other RIS countries to obtain feedback of users and measure the consumer's satisfaction with the e-coach, the followers of this tool in social networks and the behavioral change through most healthy dietary habits.**

COACHILD - PROJECT RESOULTS

eit Food
Co-funded by the European Union

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Grupo AN
DESDE 1910