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ProsocialLearn

Gamification of Prosocial Learning

for Increased Youth Inclusion and Academic Achievement

D9.6

Public final activity report

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1   Summary of the context and overall objectives of the project

Social exclusion is a key concept in Europe social policy, and both the Europe 2020 strategy and the Digital Agenda for Europe aim to ensure greater social cohesion and employment. Support for disengaged and disadvantaged learners, enhancing their employability and integration into society is a key. This includes helping young people to be more employable through the acquisition of prosocial skills from early stages in their education.

ProsocialLearn allows children to benefit from digital games tailored to teach prosocial skills that can help them achieve academically, appreciate team work and recognise the value of understanding other people's needs. By doing so, ProsocialLearn increases social inclusion and individual empowerment by helping children learn prosocial skills through digital games. ProsocialLearn has reached its primary objective through the following three pillars:

- The gamification of prosocial learning driven by a set of well-defined prosocial learning objectives that are designed for the development of specific prosocial skills, in terms of prosocial theory, gameplay and game mechanics. This pillar has resulted on the development of a set of prosocial fully-integrated games in ProsocialLearn Platform.
- The creation of an ecosystem for prosocial games that allows gaming providers and educators to access a new market place for such games. This pillar has resulted on the development of the ProsocialLearn Market Place which offers advanced tools for the production and distribution of prosocial games to educational markets allowing learning providers acquire and personalize the games according their learning needs.
- The spread of the prosociallearn concept in the educational community centered on innovative teachers eager to adopt prosociality in daily school practice. This pillar has led to the leveraging of a ProsocialLearn Community Teachers Space to provide a meeting point for schools, educators and stakeholders across Europe centered on innovative teachers eager to adopt ProsocialLearn concept. The ambassadors of the ProsocialLearn community provide educational material related to prosociality and share best practices will colleagues all around Europe.

ProsocialLearn has delivered a new ecosystem for student learning and skill acquisition based on prosocial gaming that channels creativity, innovation and technologies from the traditional gaming industry to the education sector. ProsocialLearn reduces the risks for small gaming companies by offering domain specific expertise, marketing and distribution channels for prosociallearn digital games. The ProsocialLearn platform supports developers providing scientifically proven prosocial game elements that can be used to develop games targeting children for prosocial learning through an application programming interface (API) that allows them to integrate functions (visual sensing, identification of prosocial signals from in-game actions, personalised adaptation of game elements, player profiles, game mechanics and expressive virtual characters) into digital games, whilst supporting mechanisms for data collection with protection of personal information. A prosocial gamification methodology for learning and skills acquisition using serious games is also offered based on a rigorous multidisciplinary approach that involves serious design and implementation grounded in scientific evidence in order to consistently deliver efficient content able to serve the required pedagogic goals. Thus SMEs and game developers can benefit from ProsocialLearn Market Place, ProsocialLearn game development API and a set of creative support tools as: Prosocial game design methodology guides, Prosocial game design canvas, Prosocial game design cards and Prosocial game mechanics cards.

ProsocialLearn has also delivered a framework in ProsocialLearn Market Place where educators and students can access to prosocial games and integrated them in their dairy routine. Individual perception, personality traits, abilities, attitudes, previous experiences and cultural/social beliefs significantly influence the effectiveness of learning. Such characteristics guide the selection of teaching/learning objectives to achieve the best outcomes. Games included in ProsocialLearn Market Place support personalisation and delivery of learning content by dynamically adapting and optimising game play situations and interactions for each individual player considering both persistent characteristics, and real-time emotional and cognitive state. Student outcomes can be monitored and they provide the basis for evaluating teacher, student, and game effectiveness. Driven by these signals, games can be personalized in order to achieve higher levels of player interest and, thus, maximize chances of achieving a learning objective. Using a pedagogically sound prosocial model that stores student data over time, teachers are able to efficiently monitor progress and assess mid-long term learning outcomes across multiple games and game sessions as well as to customize the game according to the learning group needs (size of teams, language, level etc)

The ProsocialLearn paradigm is disseminated through the ProsocialLearn Community Teachers Space where educators can get awareness about prosociality concepts, be engaged in seminars and feedback sessions, discuss with other colleagues and create synergies with other initiatives as well as be recruited as Teacher Ambassadors to promote the ProsocialLearn concept among their communities.

2 Work performed during the period and main results achieved so far

The period covered by this management report lasts from M18 (July 2016) until the end of the project in M38 (February 2018). During this reporting period, the activities performed can be structured along the following lines of work:

- **Development, update and integration of multimodality approach and user profiles.** Further work and development was carried on prosocial affect fusion and player modelling to support game technology capabilities for observing and analysing the performance of players. The capabilities include emotion and engagement affect observation and fusion, game interaction monitoring, social learning analytics, and visualisation feedback to teachers. The capabilities are combined to create a learning analytics pipeline that transforms student monitoring and observations into actionable insights for teachers as part of reflection and feedback activities, or for dynamic intelligent adaptation of the game itself.
- **Development of a collection of game mechanics.** The final version of the Prosocial Adaptation Manager (PAM) component was delivered. The work also comprised the development of a methodology for multimodal recognition of student engagement during gameplay using consumer-grade image and motion-sensing devices and the elaboration of mechanisms for both online and offline adaptation of games and contents.
- **Design game interface to support Natural Game Interaction using gesture.** Design of NGI (Natural Game Interactions) ProsocialLearn system based on Kinect gesture capturing tool to build up a gesture detection mechanism to be used by developers for incorporating their own specific gesture-driven interactions with their game content.
- **Creation and improvement of virtual character controllers:** the project provides a Virtual Character Controller component and subcomponents for enabling and accelerating the development of prosocial games involving expressive virtual characters. The component supports a large variety of scenarios surrounding prosocial activities and a large variety of character appearances.
- **Involvement of new SMEs in the project:** during the period the consortium was extended with three new SMEs after a deep analysis and according to the appropriateness for ProsocialLearn aims and target group, company's experience, market access and potential utilization of the resources provided by the platform. After conducting such analysis Mad about Pandas, Pixelram and Anyway became part of ProsocialLearn consortium and all the activities related to transfer knowledge took place.
- **Design and development of the Prosocial Games:** a set of games were developed: Tower Together, Pushy Paddles, The Secret Word, The Chase, Laika, Lost in Space, Seasons Soup and Emotions with Friends. Six of them were integrated in the platform exploiting as many of the features as possible within gameplay following the methodology established in Task 2.2
- **Integration of all components and final release of the platform:** the result was the delivery of a fully tested and qualified platform integrating the technical work performed during the project. This includes also the work performed in order to deploy and operate the ProsocialLearn Platform for games developed and for the pilot studies. Atos is responsible of governing the ProsocialLearn infrastructure (composed by several virtual machines and physical servers) to deliver the ProsocialLearn functionalities to end users (Game Providers, Budget Holders, Teachers and Students).
- **Piloting of the solution:** the activities aimed to develop and sustain an engaged school-based community of users as well as to plan and facilitate all school-based studies using the

platform, technologies and games developed during the project were carried out. Two pilot models were run: the first model involved 8 week design studies that took place in the UK, Greece and Italy; the second model consisted of outer-tier pilots that took place in Spain. Almost 400 children, ranging in age from 8 to 12 years old, took part in the pilots and played different games within their normal classroom activities. The results of that piloting phase were reported in D7.11 2nd Validation activities in operating school conditions.

- **Exploitation of the results:** In order to maximize the potential for commercial success a complete joint exploitation agreement for exploiting the outcomes of the project as a whole was elaborated, agreed and signed. This joint exploitation agreement provides the basis for licensing the ProsocialLearn platform as a whole incorporating share of revenue and license terms. Additionally, Individual partners have also worked on their own individual business models to exploit individual results.

3 Progress beyond the state of the art, results of the project and potential impact

3.1 Progress beyond the state of the art

The project provides outcomes for a wide range of customer segments, from students and children to teachers and parents, to developers, schools and educational organisations and ministries.

ProsocialLearn is described as a gaming platform for the design and development of games requiring high degrees of prosocial skills for the player to succeed. It is a multi-disciplinary approach paying particular attention to personalizing the game scripts, so that each individual is benefited by the console to the maximum possible extent. In particular, scenarios and reward mechanisms have been carefully designed, while connections between realistic game mechanics and levels of engagement have been also considered. ProsocialLearn offers a new market for digital games aimed at increasing social inclusion and academic performance, as well as a distribution channel to deliver these games to children and teachers in European schools

On the other hand, ProsocialLearn provides a teacher's space aimed to facilitate the process to integrate the game into the pedagogical process through the elaboration of learning units. ProsocialLearn offers a community of practice space to teachers and professionals of education to engage and support teachers in the use of ProsocialLearn resources.

3.2 Results of the project and their exploitation

ProsocialLearn project started on January 2015 and has finalized on February 2018. After just over three years of the project ProsocialLearn has delivered the ProsocialLearn Platform which comprises the outcomes of the project composed by forty nine tangible and intangible components.

The ProsocialLearn Platform includes all the ProsocialLearn results: (i) ProsocialLearn Gaming developers tools, (ii) the games developed under the project and (iii) the ProsocialLearn Teacher's community space that allow teachers to contribute to and extend the platform offerings and provide the potential to give students unparalleled access to games for social skills.

The consortium agreed an exploitation agreement which set the basis for further exploitation. The agreement covers all the assets developed during the life of the project, the ownership and the sharing of revenue. This agreement has been a catalyst for joint initiatives among members of the consortium.

3.3 Potential impact

The project provides outcomes for a wide range of customer segments, from education community (students, teachers, parents and educational institutions) to IT sector (game developers, IT and service providers).

The results of ProsocialLearn have established a novel scenario for the cooperation and common development of multidisciplinary serious games putting a central focus in social and psychologist aspects bring together practitioners from education, psychology, pedagogy, game developers and service providers. Thanks to the ProsocialLearn outcomes game developers have access to methodology and tools to effectively develop prosocial games.

ProsocialLearn underscore the development of essential social skills which have an effect on academic results and also in future access to labour market. Outcomes from ProsocialLearn increase

the effectiveness of digital games that can be designed specifically to promote prosocial skills in kids through a specific methodology and design tools for developers. Additionally the platform provides tools to assess and monitor the progress of children in the subject in a personalized fashion based on player profiles and classroom circumstances. ProsocialLearn outcomes enable methods for helping children to develop personal autonomy and essential values in today-society, such as team working, cooperation and communication.

The results of the project has empowered game industries, both within and beyond the project, to benefit from new business models offering innovative and tested games to the educational sector leading the opening of new and disruptive markets for creative and innovative SMEs. The traditional poorness of serious games in terms of quality, budget and technologies has been overcome thanks to the ProsocialLearn tools and services. Thanks to the contribution of ProsocialLearn to transform the serious games sector new markets are now available and ready for incorporating prosocial games in its daily activities. ProsocialLearn project has carried out an intense activity in education communities to spread the ProsocialLearn concept and outcomes through the ProsocialLearn Teachers Community Space.