HORIZON2020 FRAMEWORK PROGRAMME

ICT – 21 -2014

Advanced digital gaming/gamification technologies

ProsocialLearn

Gamification of Prosocial Learning

for Increased Youth Inclusion and Academic Achievement

D7.2

1st Experiment Planning and Community Management

Document Control Page

WP/Task	WP7 / T7.2
Title	D7.2 1st Experiment Planning and Community Management
Due date	30/09/2015
Submission date	05/11/2015
Abstract	The present deliverable, outlines the overall strategy for approaching the tasks of (a) developing and sustaining an engaged school-based community of ProsocialLearn users; and (b)planning and facilitating small-scale and large-scale school-based evaluation studies of the Prosocial Learn technological solution. It also presents the preliminary work undertaken so far, and details the activities planned for M9-15 with respect to community development and small-scale studies.
Author(s)	Evangelia Dimaraki (EA), Anna Zoakou (EA)
Contributor(s)	Kosmas Dimitropoulos (CERTH), Stefano Cobello (EUR), Michael Boniface(ITINNOV), Brian Pickering (ITINNOV), Stefano Modafferi (ITINNOV), Christopher Peters (KTH),Kam Star (PG), Jack Cannon (PG), James Allsopp (PG)
Reviewer(s)	Kosmas Dimitropoulos (CERTH)
Dissemination level	☐ internal ☒ public ☐ confidential

Document Control Page

Version	Date	Modified by	Comments
0.1	04/08/2015	Evangelia Dimaraki (EA)	Table of contents and section summaries with contribution assignments
0.2	11/09/2015	Evangelia Dimaraki (EA)	Incorporation of partner comments and contributions in all sections. Alignment with D2.5 draft in progress. Elaboration of all sections. Abstract added.
0.3	24/09/2015	Anna Zoakou (EA) Evangelia Dimaraki (EA)	Sections on Prosocial Learn Community completed. Sections on Small studies revised based on update information from appropriate partners.
0.4	16/10/2015	Anna Zoakou (EA)	Sections on Prosocial Learn Community revised and elaborated to include introductory workshops. Related appendix added.
0.5	18/10/2015	Evangelia Dimaraki(EA) Anna Zoakou (EA)	Information on Small Studies updated based on project technical meeting in London. Section 4 on Prosocial Learn Community revised and elaborated

0.6	27/10/2015	Evangelia Dimaraki(EA)	Information on Small Studies updated based on project technical meeting in London. Appendix with School Questionaire Added. Executive Summary and Conclusion added. Overall editing and formatting.
0.7	28/10/2015	Kam Star (PG) Evangelia Dimaraki (EA)	Minor additions and changes
0.8	04/11/2015	Evangelia Dimaraki (EA)	Final Version, taking into consideration the internal review by CERTH
0.9	04/11/2015	Pilar Pérez (ATOS)	Quality and format review

List of Abbreviations

Abbreviation	Description
EC	European Commission
PO	Project Officer
DPA	Data Protection Authority
PLO	Prosocial Learning Objective
EMB	Ethics Management Board
QoE	Quality of Experience
PoT	Path of Trust (Game)

Executive summary

ProsocialLearn is a project that aims to create a ground-breaking digital gaming genre that will help children to acquire prosocial skills necessary for positive relationships, team working, trustworthiness and emotional intelligence; to catalyze an increase in the number of prosocial digital games that are available for use in European Schools and tailored to their needs; and to develop a European market for prosocial digital games

By building on a game development and distribution platform for the production of prosocial games that engages children and stimulates technology transfer from traditional game industry to the education sector, ProsocialLearn will offer games developers scientifically proven prosocial game elements for development digital games, including functions such as visual sensing, identification of prosocial signals from in-game actions, personalised adaptation of game elements, player profiles, game mechanics and expressive virtual characters.

Through a multi-disciplinary collaboration between industry, researchers, psychologists, pedagogists and teaching professionals, ProsocialLearn will address complex factors associated with child development and advanced ICT in school curricula. Both short term and longitudinal studies (pilots) will be conducted at schools across Europe to build scientific evidence for the conceptual premise, technological components and game elements to be integrated into the ProsocialLearn platform.

This document is the first of a series of three deliverables that report on the work of T7.2: Experimental Planning and Community Management. The task includes all work necessary to:

- develop and sustain an engaged school-based community of ProsocialLearn users,
- plan and facilitate formative small-scale school-based experiments using the ProsocialLearn platform, technologies and games (including logistics for attaining the necessary human resources, space and other equipment needed),
- plan and facilitate large-scale school-based validation studies of ProsocialLearn.

The present deliverable, outlines the overall strategy for approaching these interrelated areas of work; presents the work undertaken so far; and, details the activities planned up to M15 with respect to community development and small-scale studies. Deliverable 7.3 will update and extend this plan through M24, while deliverable 7.4 will focus on experimental planning and community management for the large-scale validation studies.

Specifically, with respect to **community management,** our strategy has two main objectives: (a) to engage schools and stakeholders across Europe into a community that will grow and span beyond the funding period of the project, sustaining the vision of cultivating students' prosociality through games; and, (b) to provide a pool of schools for conducting both the small-scale experiments and the large scale validation of ProsocialLearn. Our strategy has three distinct phases. In the **1st phase** (M9-15), the emphasis in our work is on developing awareness of prosociality concepts and adopting the corresponding Prosocial Learning Objectives (PLOs). We combine open events that aim to raise awareness of the project and enlist interested teachers and schools with more focused events that involve teachers into design, training and piloting activities. In the **2nd phase** (M16-24), we will select the most appropriate community-oriented tools to support the goals of the community, so that our members are given the opportunity to discuss, share their opinions on prosocial games, provide their feedback on piloting and schools' involvement and highlight stories of community successes to capture best practices. In parallel we will continue face-to-face events and the recruitment of new

members to ProsocialLearn community. In the **3rd phase** (M25-30), our main focus will be on the sustainability of ProsocialLearn community and the finalization all procedures for its stand-alone presence after the funding period of the project. Currently, we are planning and implementing the 1st phase of community building. Contacts have been made already with several schools and teachers in six countries; two teacher induction and initial training workshops have been implemented so far; and, a series of other actions for community building have been planned.

With respect to **experimental planning,** our strategy focuses on fitting project needs into a realistic and feasible plan of school-based experiments, taking into account both the gradual maturation of the ProsocialLearn technical solution and the constraints of implementing experimental trials in school contexts. Experimental planning is framed by the three evaluation phases that have been defined, in the evaluation methodology (D 2.5). In the **1st phase** (M9-15)**:** a series of small-scale experiments will focus on collectinf data for WP3 and WP4 modules, e.g., data fusion, adaptation, virtual characters etc., and to validate technical functionalities in the context of initial prosocial games. In the **2nd phase** (M16-24), of small-scale experiments will assess the final version of the platform and its components, validate the functionality and user acceptance of the prototype games, and gather user feedback to improve platform aspects related to graphics, virtual characters, adaptation and natural interaction. The **3rd phase** is the final evaluation phase that involves longitudinal studies for assessing overall pedagogic and psycho-social value of prosocial games. Currently, we are planning and implementing the 1st phase of experimental planning. We have designed three prototype games as contexts for the small-scale studies. This approach allows us to consolidate experimental trials by use each game as a unit in the context of which several components of interest will be embedded. Two on-site trials have already been conducted in June 2015, with one of the games in order to collect data for the development and optimization of various technological modalities such as sensors, processing algorithms and interfaces. The small-scale studies plan until M15 includes six studies on: (1) gesture recognition, facial expression analysis, Gaze analysis, Body motion analysis and evaluation of game usability; (2) Data fusion, evaluation of game usability and effectiveness and platform technical validation; (3) Data fusion algorithm, adaptation and platform technical validation; (4) expressive virtual characters and game scenarios; (5) ProsocialLearn concept validation and classification of emotions using voice; (6) voice interaction and collaborative behaviour

Extensive material necessary for the implementation of the task is appended, including: planning forms and checklists for small studies; training material for teacher induction workshops; a teachers' and schools' questionnaire; experimental protocols for the studies planned; and, a protocol for ethical conduct of the studies, including updated versions of informed consent exemplars.

Index

1 Introduction

1.1 Purpose of the document

This document is the first of a series of three deliverables that report on the work of T7.2: Experimental Planning and Community Management. The task includes all work necessary to:

- develop and sustain an engaged school-based community of ProsocialLearn users,
- plan and facilitate formative small-scale school-based experiments using the ProsocialLearn platform, technologies and games (including logistics for attaining the necessary human resources, space and other equipment needed),
- plan and facilitate large-scale school-based validation studies of ProsocialLearn.

The present deliverable, outlines the overall strategy for approaching these interrelated areas of work; presents the preliminary work undertaken so far; and, details the activities planned up to M15 with respect to community development and small-scale studies. Deliverable 7.3 will update and extend this plan through M24, while deliverable 7.4 will focus on experimental planning and community management for the large-scale validation studies.

1.2 Scope and audience of the document

The dissemination level of this document is public. The audience for this document includes the consortium partners who will directly or indirectly partake in the school-based experiments of ProsocialLearn technologies, as well as other researchers who are involved in projects that require deploying and testing innovative technologies in school settings. The document provides a clear map of interdependencies, of the necessary flow of activities and information, as well as of proper procedures and timelines for accomplishing this highly collaborative task.

The document will also be of use to the Ethics Management Board and the Independent Ethics Advisory Board of the project, in order to initiate and monitor appropriate procedures. Naturally, the Prosocial Learn PO and reviewers will use this deliverable and the ones to follow for assessing the progress of the task.

1.3 Structure of the document

The document contains the following sections:

Section 1: Introduction – an introductory section, i.e. this present section, which describes the main purpose of the document

Section 2: Overall Approach and Organization of the Task – summarises the process to build a ProsocialLearn teacher community and plan small and large scale experiments.

Section 3: Focus upon the preliminary work carried out, the analysis of needs and the early test of game prototype.

Section 4: Presents the teachers activities planned in the following months.

Section 5: Presents in detail the work related to the small scale studies describing the experimental games and testing kits and the planning for implementing those small scale studies.

Section 6: This section contents the conclusions of the present report.

The deliverable presents six appendixes detailing the phases and activities of the community building process, the planning documents for the small studies, the material for teachers used in the workshops, the questionnaire elaborated for schools communities, the experimental protocols for the first phase in the small studies and the ethical practices protocol.

2 Overall Approach and Organization of the Task

2.1 Building and Managing a ProSocialLearn Teacher Community of practice

Communities of practice are dynamic social structures that require "cultivation" so that they can emerge and grow.[1]

Communities have lifecycles—they emerge, they grow, and they have life spans. For each lifecycle phase, specific design, facilitation, and support strategies exist that help achieve the goals of the community and lead it into its next stage of development. If the community is successful, over time the energy, commitment to, and visibility of the community will grow until the community becomes institutionalized as a core value-added capability of the sponsoring organization.[2]

In order to create and sustain a ProsocialLearn community of interest involving schools and stakeholders across Europe, the following are some key areas of work to be undertaken:

- leverage existing networks of the education partners to spread the word and enlist interested schools, teachers and stakeholders,
- organize school and teacher induction events: these are events where teachers are introduced to concepts of prosociality and prosocial games and are given the opportunity to become part of the ProsocialLearn community,
- provide a manageable stream of information and activities that sustain the interest of schools and teachers about prosocial learning and games,
- enlist the schools and teachers that will form part of the core ProsocialLearn community and engage them in more focused activities that invite their input to the project pedagogical approach,
- provide training and support in prosocial gaming and its integration in teacher practice (events and material).

Building a sustained ProsocialLearn community, will provide a pool of schools for conducting both the small-scale experiments and the large scale validation of ProsocialLearn. Therefore, our work will need to include:

- enlisting schools and teachers interested in participating in the ProsocialLearn experiments
- surveying schools in the ProsocialLearn community about their demographics (social, cultural, psychological) and their constraints (e.g. technological facilities), using a short questionnaire (see Appendix 4)[3]
- gathering information about local requirements of permissions, ethical clearance and DPA registration

---

[1] *Etienne Wenger, Richard McDermott, & William Snyder, Cultivating Communities of Practice: A Guide to Managing Knowledge, Boston, MA: Harvard Business School Press, 2002*

[2] *Darren Cambridge, Soren Kaplan, and Vicki Suter, Step by Step Guide for Designing and Cultivating Communities of Practice, 2005,* available at http://net.educause.edu/ir/library/pdf/nli0531.pdf

[3] adapted to the needs of our project some questions available in a respective questionnaire in Europa site available at http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=1814

- organizing and managing this information in a database that represents the pool of candidate study sites

There are two major challenges associated with building the ProsocialLearn Community of practice:

(a) the diversity of national languages, educational systems and curricula across Europe;

(b) the need to engage teachers and secure the participation of schools, before the ProsocialLearn Platform and Games are available.

To address these challenges, our strategy is to create national communities in several European countries, centering around innovative teachers recruited early in the project to serve as **prosociality ambassadors** and to scale them gradually in successive phases, taking into account the maturation of the ProsocialLearn technical solution and the corresponding needs for school-based evaluation (as described in detail in D 2.5 and in section 2.2 below).

In parallel we will adapt to the rationale of ProsocialLearn the phases[4] that follow, with the view to setting up a sustainable community of practice that will encourage teachers and pupils to learn from one another's experiences, share resources, adopt a prosocial learning style, exploit networking and mobility opportunities and involve from an early stage policy makers and stakeholders.

The steps for setting up, sustaining and expanding ProsocialLearn community of interest could be summarized in the following:

- *Inquire: Through a process of exploration and inquiry, identify the audience, purpose, goals, and vision for the community.*
- *Design: Define the activities, technologies, group processes, and roles that will support the community's goals.*
- *Prototype: Pilot the communities with a select group of key stakeholders to gain commitment, test assumptions, refine the strategy, and establish a success story.*
- *Launch: Roll out the community to a broader audience over a period of time in ways that engage newcomers and deliver immediate benefits.*
- *Grow: Engage members in collaborative learning and knowledge sharing activities, group projects, and networking events that meet individual, group, and organizational goals while creating an increasing cycle of participation and contribution.*
- *Sustain: Cultivate and assess the knowledge and "products" created by the community to inform new strategies, goals, activities, roles, technologies, and business models for the future.[5]*

The full scheme of proposed activities needed for the establishment, communication, facilitation and sustainable development of ProSocialLearn community of interest is available in Appendix 1. Although this scheme is provided as a point of reference for community building, it is up to each partner to adapt the formula provided to the national conditions, the learning profile and needs of the target audience and stakeholders addressed.

Under this perspective the following activities are proposed:

1st phase (M9-15): in this phase the emphasis in our work with teachers and stakeholders will be on developing awareness of prosociality concepts and adopting the corresponding PLOs. We will

---

[4] Adapted from McDermott, 2002.

[5] Darren Cambridge, Soren Kaplan, and Vicki Suter, *Step by Step Guide for Designing and Cultivating Communities of Practice*, 2005, available at http://net.educause.edu/ir/library/pdf/nli0531.pdf

combine open events that aim to raise awareness of the project and enlist interested teachers and schools with more focused events that aim to:

a) train prosociality ambassadors in school communities,
b) invite their input in the game-based learning approach of the project and,
c) engage them in the formative field testing of technical functionalities embedded initial ProsocialLearn games, as described below.

At the same time we will explore all face-to-face meeting opportunities, i.e. info- days, training sessions, conferences, etc., with the view to diffusing prosociality, inform on the project activities aiming at continuously expanding the circle of people interested in ProsocialLearn activities and gradually establishing a community of interest.

Under this framework a tentative schedule for the community (weekly, monthly, quarterly, and/or annually) will be set, so as to inform all current and future members at frequent intervals about the project progress, the piloting phases, the scheduled training activities etc.

Additionally certain educational portals will be selected under the criterion of thematic reference to the project rationale and the popularity among the target group of the project, (i.e. the school community, students of pedagogical faculties, teachers' associations, stakeholders and policy makers). The presentation of ProsocialLearn activities on the abovementioned media will reassure its broadest diffusion at national and European level and will contribute to the establishment of the ProsocialLearn community;

2nd phase (M16-24): in this phase we will select the most appropriate community-oriented tools to support the goals of the community, so that our members are given the opportunity to discuss, share their opinions on prosocial games and provide their feedback on piloting and schools' involvement. To this end we will facilitate events and activities to exercise the prototype, focusing on achieving short term value added events. In parallel we will try to recruit new members to ProsocialLearn community, introduce them to prosocial digital games, finalize and publicize a community calendar of events, so that all members have an overview of the activities and plan ahead their participation.

At the same time we will focus on setting up the most appropriate communication channels (news, announcements, newsletters, integration with face-to-face meetings, etc.), we will highlight and share stories of community successes (e.g., how the implementation of prosocial digital games has led to the mitigation of social exclusion phenomena, etc.) to capture best practices and create excitement and momentum. Additionally we will facilitate discussions about the community itself, including the community culture, processes and practices, technology, and individual motivations for participation.

During this phase we will create synergies with projects - and consequently communities developed - under the same or respective subject areas, with the view to disseminating ProsocialLearn, recruit new members, handle efficiently common problems and exchange opinions on the added value of prosociality on classroom management and any difficulties may arise.

3rd phase (M25-30): in this phase our main concern is to focus on the sustainability of ProsocialLearn community and the finalization all procedures for its stand-alone presence after the funding period of the project.

To this end we will deliver a support infrastructure including documentation and mentoring of the existing members and the new ones that will be recruited. Under this perspective we will provide

opportunities in the community for members to play new roles, experiment with new community activities, and have access to a full version of prosocial digital games. Additionally we will highly prioritize:

a. The identification of opportunities for capturing new knowledge related to prosociality, including establishing new roles related to harvesting and creating best practices with the framework of the community

b. The development of policies and processes for harvesting and sharing knowledge outside the community

c. The publication of articles about the community and its projects aiming at maximizing Prosociality community of practice presentation across social media and communication channels.

More specifics about the actions planned so far in order to achieve the above goals and implement this strategy in M 9-15 are presented in section 4 below. This plan will be updated and extended in Deliverables 7.3 and 7.4

2.2 Planning Small-Scale Experiments

ProsocialLearn will conduct a series of short and small-scale studies with children in European schools. Short studies are necessary to produce initial evidence that ProsocialLearn concepts and technologies are sufficiently robust that they can be scaled up to larger longitudinal studies. By conducting short studies the risk and cost of failure due to conceptual errors, incorrect assumptions and incorrect software implementation can be significantly reduced.

The process of teaching 7-10 year old children prosocial skills through gamification has significant uncertainty. Many aspects of the learning process has unknowns: e.g. quantifiably modelling prosocial domains (trust, empathy, generosity, etc), automatically observing emotional affect, automatically measuring and fusing prosocial indicators in accordance with the prosocial domains, defining appropriate Prosocial Learning objectives.

At this point, it is worth clarifying the difference between software testing and experimentation as two different but interrelated disciplines. Software testing is a structured process that involves the verification and validation of software to know how well it meets specified requirements, standards, and fitness to cost and use. Verification is simply "Does the system/software meet the specification?" whereas validation is "Does the system/software do what the users want?"

The challenge for ProsocialLearn is that we do not have a specification because the phenomena (e.g. psychological) involved in the processes we are studying are complex and therefore software testing alone is insufficient. Therefore, ProsocialLearn must conduct a series of experiments to explore how prosocial processes behave under different conditions, in order to establish the knowledge necessary to design and configure prosocial games that deliver the desired learning outcomes. Short studies are designed to investigate specific concepts and technologies developed by WP2, WP and WP4 and their integration as part of the ProsocialLearn platform and games in WP5 and WP6.

The formative small-scale studies required for the ProsocialLearn platform, game mechanics and component technologies are described in detail in Deliverable 2.5. The evaluation process outlined in that document has three distinct phases.

- **First evaluation phase (M9-15):** a series of small-scale experiments in operational or near operational school conditions to assess the performance of the first version of the platform

and its modules, to collect data for WP3 and WP4 modules, e.g., data fusion, adaptation etc., and to validate technical functionalities in the context of initial prosocial games

- **Second evaluation phase(M16-24):** a series of small-scale experiments in operational or near operational school conditions to assess the final version of the platform and its components, to validate the functionality and user acceptance of the prototype games developed in T6.2., and to adjust/improve platform aspects related to graphics, virtual characters, adaptation and natural interaction based on user feedback.
- **Third evaluation phase (M 25-36):** is the final evaluation phase that involves longitudinal studies for assessing overall pedagogic and psycho-social value of prosocial games.
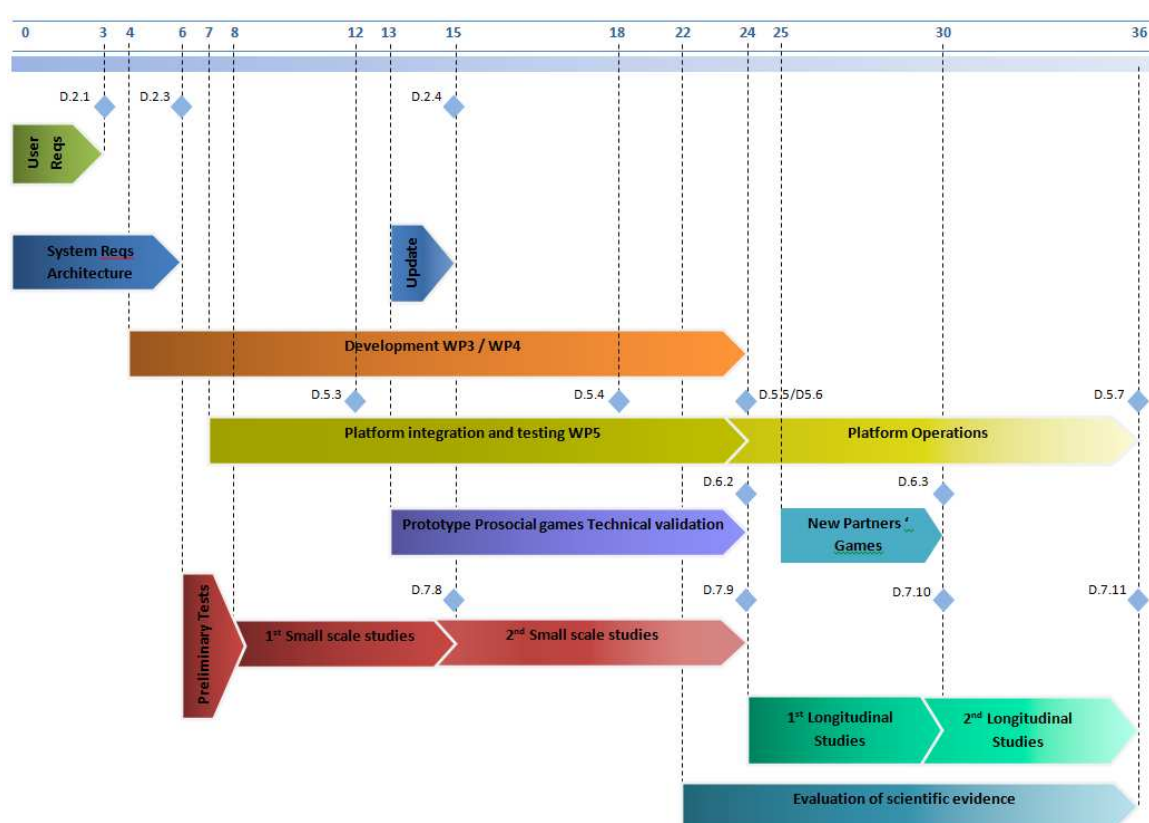
Figure 1 – Organization of the ProsocialLearn evaluation plan

All technical components of Prosocial Learn that will be submitted to small-scale experiments of the first two phases are listed in Deliverable 2.5 Here we will focus more specifically on the considerations related with fitting these project needs into a realistic and feasible plan of school-based experiments, taking into account both the gradual maturation of the ProsocialLearn technical solution and the constraints of implementing experimental trials in school contexts.

First, **it is important for the feasibility of the studies, within project resources, to consider consolidation, so that one on-site experiment can serve several data collection needs**. For this purpose, each school-based experiment will be organized using an experimental game as a unit in the context of which several technical components of interest will be embedded. Three simple games developed within the ProsocialLearn project for the purposes of experimentation will be used during the first phase evaluation phase: Path of Trust; Kitty King's Candy Quest and the Cooperative Game.

In addition, **a school-based experiment needs to be a valuable experience for the participants**. A game-based learning module based on the corresponding PLOs will accompany the game, to ensure that the experimental trial is also a pedagogically valuable experience.

Classroom time and teacher good-will are valuable resources for the project, and will be respected, as a priority during all trials. For this reason, **preliminary lab tests have already been conducted prior to school-based trials and will continue.** We apply principles of software testing to ensure systems are sufficiently robust and reliable to be played by children in school settings and to generate the required measurements and observations during experimentation. No preventable technical complications will be encountered during precious site-trial times.

In addition it is important **to select sites for formative trials carefully and prepare teacher and student about what to expect in each phase of the trials** before they commit to it, especially the first phase that will involve simple games serving as vehicles for testing technical components. Every effort will be made for games and supporting activities to be attractive, requested classroom time to be short and expectations to be set appropriately. The trials will be scaled cautiously from one phase to the next.

Small-scale experiments are contingent upon the technologies and games designed in the technical WPs of the project, and are designed to address questions that serve as input to the work conducted in these WPs. Therefore a good flow of information among partners and a clear timeline for each small study are indispensable prerequisite to make the study feasible, as described in more detail in section 5.

2.3   Planning Large-Scale Validation Studies

This aspect of the task will be addressed in subsequent deliverables, when essential inputs for planning the large scale longitudinal studies are available namely:

- Assessment of the potential engagement of the ProsocialLearn community of teachers
- Demographic information about the schools participating in ProsocialLearn
- The Evaluation Strategy to be specified in Deliverable 2.5

3   Preliminary work (M 1-6)

Task 7.2. was initiated earlier than planned in the project timeline, because the consortium agreed in February that other project tasks, specifically Task 2.1 (User Requirements Analysis) and Task 3.1 (Player input modalities) would benefit from early end-user input, which involved establishing contacts with school communities, surveying teachers and running preliminary small-scale trials with students. The work completed is described in the following sections.

3.1   Needs Analysis Survey for Teachers

A needs analysis survey of teachers was conducted for the needs of Task 2.1 (User Requirements Analysis). For that purpose, the existing networks of the education partners (EA and EUR) were mobilized, and schools and teachers interested in becoming part of ProsocialLearn were enlisted, specifically:

- **49 teachers from project countries**: UK (3 teachers), Italy (4 teachers), Spain (17 teachers), Greece (25 teachers)
- **10 teachers from other countries:** Turkey (5 teachers), FYROM (5 teachers)

The methodology and results of this survey are reported in Deliverable 2.1. For the purpose of the present deliverable it is important to note that the teachers who participated in the survey constitute an initial pool for the ProsocialLearn community. Further the survey has provided some initial data on the values, expectations and constraints of prospective participants.

3.2   Early Testing of a Game prototype

Although the preliminary phase was not initially foreseen in the project description, the consortium decided to conduct a series of small scale experiments in order to collect data to be used for the development and optimization of various technological modalities related to Task 3.1 such as sensors, processing algorithms and interfaces. For the collection of data, a first prototype game, the Path of Trust, was developed by CERTH aiming to foster trust and cooperation among children aged 7-10. (The game is described in section 5 below). Two on-site trials were conducted in June 2015 using the Path of Trust game:

- Semi-Rural Central Greece Public Primary: 14 students 7-9 of age (7 boys-7 girls)
- Suburban Private Primary Near Athens: 16 students 8-9 of age (4 boys-12 girls)

In the course of planning the studies, we also explored recruiting additional interested primary schools from Spain and Sweden, but it was not possible to schedule within the given time constraints.

The outcome of the preliminary tests will be reported in D7.8 "1st Results of Small Experimental Studies".

Apart from their substantive purpose, these early studies served as a pilot round for the evaluation procedure, and as such laid some valuable groundwork:

- a shared understanding within the consortium of what organizing an on-site trial entails in terms of timeframe, collaboration and flow of information,
- a written procedure and a timeline of steps for the collaboration between technical partners, educational partners and participating schools,

- necessary materials (experimental studies protocol, teacher leaflet, consent form, QoE questionnaire for children) developed and field tested,
- a realistic sense of the resources needed for a small-scale experiment in terms of space, time, personnel and technological setup.

As it is evident in the present document, all these were taken into account and utilized in planning and preparing the subsequent evaluation studies.

4   ProSocialLearn Teacher Community: Activities Planned for M9-15

As we have already described in section 2.1, in this first phase we will mainly work on raising awareness of prosociality concepts, while simultaneously setting up and expanding the circle of people interested in ProsocialLearn activities in order, gradually, to establish a community of interest.

At the same time we will explore all face-to-face meeting opportunities, i.e. info- days, training sessions, conferences, etc., with the view to diffusing prosociality, inform on the project activities aiming at continuously.

4.1   Key areas of focus for M9-15

During this period we will combine open events that aim to raise awareness of the project and enlist interest for participation with more focused events that aim to train prosociality ambassadors in school communities, to invite their input in the game-based learning approach of the project and to engage them in the formative field testing. Specifically we will work to:

- leverage existing networks of the education partners to spread the word and enlist interested schools and teachers,
- organise school and teacher induction events: these are events where teachers are introduced to concepts of prosociality and prosocial games and are given the opportunity to become part of the ProsocialLearn community,
- enlist the schools and teachers that will form part of the core ProsocialLearn community and engage them in more focused activities that invite their input to the project pedagogical approach,
- enlist schools and teachers interested in participating in the ProsocialLearn small-scale experiments (based on experimental site needs defined),
- obtain appropriate Permissions, Ethical Clearance and DPA Registration,
- maintain a database of the pool of candidate study sites, for the next phases of small-scale and longitudinal studies .

4.2   Completed and Planned activities in M9-15

4.2.1   Teacher induction and initial training workshops

The emphasis in the teacher induction and initial training workshops is on developing awareness of prosociality concepts, adopting the corresponding PLOs and exploring the potential of game-based approaches to learning. Teachers are invited to share their experiences with colleagues across Europe, exchange opinions, test prosocial game prototypes and design activities tailored to the needs of their pupils.

To this end two introductory workshops have been so far organized:

- September 2015, Athens, Greece: *"ProsocialLearn: introduction to prosociality & prosocial learning games".* An EDEN Open Classroom 2015 training workshop, which aimed to launch ProsocialLearn at national and European level and set the basis for the development of a community of interest. Participants were encouraged to register for participation in subsequent focus groups and experimental trials. (Duration: 120 minutes, # of participants: 12)

- October 2015, Verona Italy: An initial training workshop for teachers from Spain, Lithuania, Turkey, FYROM and Italy. Participants were encouraged to enlist as prosociality ambassadors that promote a prosocial learning ethic in their school environment and with their students, and to become part of the ProsocialLearn community. (Duration: 120 minutes, # of participants: 21)

Both workshops begun by asking the trainees to participate in the following "ice breaking" activity: they should split in groups of three, one member of the group would think and narrate to the others in 2-3 minutes something that has happened to him/ her the previous days, and the other members would try to guess how the narrator had felt, and should write it down to the A3 papers they were given. If they guessed correctly, they would get one point; they should play three rounds of this game and the main idea was, apart from getting to know the members of their team, to step into another person's shoes, i.e. to get familiarized with empathy, which is one of the main features of prosociality.

The workshop continued by initiating educators to the ecosystem of prosocial games by offering a theoretical framework and engaging the audience to the process of design and development of learning activities corresponding to certain prosocial features.

As such, trainees were introduced to:
a) **ProsocialLearn project, i.e.**
   1) Short description
   2) Aims and Objectives
b) **the rationale of prosociality:**
   1) what do we mean by prosocial culture and prosocial learning style
   2) what are the features of prosocial behaviour
   3) examples of prosocial projects run within school environment
   4) reference to tangible prosocial projects' outcomes and positive correlation between the implementation of prosocial behaviour and the improvement of school climate, i.e. mitigation of social exclusion phenomena, reinforcement of communication and collaboration among teachers and pupils, adaptation of a prosocial code of behaviour, etc.
c) **digital games**
   1) what is a game and what are its main features
   2) games in education (i.e. gamification, mini games/ trigger games, curriculum games/ learning games, overarching game worlds
   3) examples of educational games related to prosociality

In the 2nd part of the workshops participants were involved in hands-on activities.

Initially the game "Path of Trust" was presented; its rules and rationale were explained in detail. Two of the trainees played the game and afterwards a handout was given to them which identified how the main features of prosociality are related to learning objects and game elements. During Verona workshops the game "Candy Quest" was also presented, its relation to prosociality was highlighted and participants were invited to test it.

Additionally participants were asked to reflect on the following:

- Whether "Path of Trust" and "Candy Quest" could be used in didactic practice, so as to encourage cooperation and trust. What would be the challenges of such a venture?
- How could "Path of Trust" and "Candy Quest" be integrated to learning process?
- Identify the set of activities that should be added, so as to offer a complete pedagogical approach.
- What improvements/ changes they would you suggest to both games?
- Provide the outline of a lesson plan related to "Path of Trust" and "Candy Quest"

Participants mentioned that one of the main challenges for the implementation of such games in classroom is the equipment, since it should not be taken for granted that all schools have internet connection and PCs. In the case of "Path of Trust" they suggested that the game itself should have additional levels of difficulty and intermediary prizes related to the acquisition of prosocial skills. Participants highlighted the importance of an induction activity related to the identification of the terms cooperation and trust, so that pupils are familiarized with the terms before playing the game.

In the last part of the workshop participants were asked to design their own learning activities/ games on one of the following pairs of prosocial skills:

- Empathy–Compassion
- Cooperation –Trust
- Fairness–Generosity

They should identify which would be the learning objectives of such activities/ games, in the framework of which subject area they could be implemented and how they could be evaluated.

Due to lack of time participants were asked to think about potential activities and send them by email. Some of the participants send their input selecting the pair of cooperation- trust; they suggested the activity of the "blind caterpillar", i.e. each team is composed by six members who position themselves in a single file, blindfolded except for the last in line. The latter guides the others along a path drawn in chalk. The guide cannot talk, but communicates by pre-set non-verbal signals: e.g. a clap on the right shoulder indicates to turn right, one on the neck to go straight on …) The objective of this activity is reached, when all students are ready to change roles. They proposed to implement such a game during the after school activities or in the class of Gym.

It followed email communication with participants, thanking them for their participation and sending them all workshop materials; trainees gave positive feedback and expressed their interest to actively join ProsocialLearn community and participate in the pilot phase.

It should be mentioned that all workshops' material are available in Appendix 3. Materials are also available in Greek. The materials can be used for additional introductory workshops, in parallel with the second step of focus groups described below.

4.2.2   Organization of focus groups

Focus groups are a step beyond the introductory workshops and will involve an initial small core community of interested practitioners. Focus groups will aim at the following:
- ✓ Familiarization of participants with prosociality and prosocial game ecosystem
- ✓ Identification of the relation among prosocial skills, social inclusion, individual empowerment and success in formal education

✓ Presentation of prosocial games and mapping of prosocial skills, so that participants have a first-hand experience of the respective activities

✓ Testing of ProsocialLearn games currently available and collection of feedback from participants

✓ Encouraging participants to design prosocial activities in order to establish a community of interest that will work together under the framework of prosociality during and after the lifetime of the project

✓ Setting up of the ProsocialLearn community of interest and investigating their interest to participate in pilot phases

4.2.3   Steps towards the development of a sustained community of practice

The initial small core community of interested practitioners needs to be developed and nurtured further for the duration of the project. Relevant steps in the first phase of community building are the following:

- **Create a mission and vision statement for the community, tying these into the sponsoring organization's mission and vision if appropriate.**

✓ Describe in a detailed, but still open manner, the vision statement of prosocialLearn community of interest, i.e. rationale, actions, members, prosocialLearn schools and ambassadors, tasks and planning.

✓ Identify how prosocialLearn community of interest will be widely promoted at local and European level, i.e. list the social media that will be used, the contact lists that will be created, how certain stakeholders and policy makers will be addressed and encouraged to actively participate and how prosocialLearn partners will approach the most appropriate channels, portals, professional associations and groups, etc., so as to ensure the long term visibility of the community, during and after the funding period of the project.

- **Create a mailing list and/or a blog, through which teachers and stakeholders communicate, share info and project updates**

✓ Teachers and stakeholders may use this mailing list/ blog as an opportunity to share their experiences from prosocialLearn piloting, suggest dos and don'ts for a successful implementation, exchange opinions, so that it is gradually created the sense of belonging to a lively community.

- **Identify any face-to-face meeting opportunities for community members and define how these will be incorporated into the community experience (conferences, etc.).**

✓ Identify potential conferences and info-days, where ProsocialLearn workshops could be organised, with a twofold aim: a. disseminate ProsocialLearn project and communicate project updates, b. recruit new members to prosocialLearn community

- **Lay out a tentative schedule for the community (weekly, monthly, quarterly, and/or annually)**

✓ Create a public calendar, where all community activities will be available, along with a short description and all training materials, encouraging participants to add their own touch as well.

- **Create a timeline for the community's development**

✓ It is important for all members to know the current stage of the community and what it is expected the following months, so as to feel that they co-formulate and co- design the next steps, to realize that they are part of this process and develop a sense of ownership for the ProsocialLearn community.

- **Create a directory or folder structure for organizing discussions, documents, and resources.**
✓ It is highly recommended to create a common space (and open to discussion how and where this space will be hosted), where the members ProsocialLearn community will have access to all available documentation, i.e. vision statement, multilingual resources, etc.

- **Determine facilitator roles and recruit the first community facilitator(s)**
✓ Community facilitators will be appointed at a voluntary basis; teachers and stakeholders, familiarized with the ProsocialLearn rationale and piloting phase, will be assigned the role of facilitating new and potential members to adjust to ProsocialLearn ecosystem and community, i.e. explain ProsocialLearn features, introduce them to the other members of ProsocialLearn community, provide all info and training package, etc.

5   Small-Scale Studies Planned for M 9-15

As noted earlier, each small-case study will be organized using an experimental game as a unit in the context of which several technical components of interest will be embedded. Three simple games developed within the ProsocialLearn project for the purposes of experimentation will be used during the first phase evaluation phase: Path of Trust; Kitty King's Candy Quest and the Cooperative Game. In addition a study is planned using a testing kit of simple visual stimuli in a gameful context. Using these as vehicles for experimentation, a total of 6 small-scale studies are designed for this first phase.

5.1   Overview of Small-Scale studies planned

The following table presents the small studies planned for M 9-15. Depending on the design of the experiment, one or more school-based experimental trials will be conducted for each study, as indicated below.

#	Evaluation of …	Technical Partner(s)	When	Where	~# of Players	Testing 'Kit'/' Game
01	Gesture recognition algorithm Facial expression analysis Gaze analysis Body motion analysis for ER Evaluation of game usability	CERTH, EA	M11-12	Thessaloniki GREECE	10-20	Path of Trust
02	Data fusion algorithm Evaluation of game usability and effectiveness Platform technical validation	CERTH, EA	M12-13	Athens, GREECE	10-20	Path of Trust
03	Data fusion algorithm Adaptation algorithm Platform technical validation	CERTH, EA	M14	Athens, GREECE	10-20	Path of Trust
04	Expressive Virtual Characters and Game Scenarios	KTH RK	M13-15	Stockhom, SWEDEN and/or Athens, GREECE	30	Video Stimuli
05	ProsocialLearn Concept Validation, Classification of	ATOS, ITINNOV, PG	M11-12 and	Athens, GREECE and/or	60	Kitty King's Candy Quest

	Emotions using Voice		M13-15	Barcelona, SPAIN and/or ITALY and/or FYROM		
06	Voice Interaction and collaborative behaviour	ITINNOV	M13-15	UK and/or Italy and/or Bulgaria and/or FYROM	60	Cooperative Game

Table 1 – Small Scale Experiments M9-M15

5.2 Description of Experimental Games and Testing Kits

The experimental games and testing kits to be used are described below.

- **Path of Trust**, is a two-player game about trust and cooperation. Two adventurers, the Guide and the Muscle, venture into an ancient labyrinth-like tomb to uncover hidden treasures. The Guide can see the tomb visualized on the screen and can provide directions, but does not have the strength to move around. The Muscle is able to run through the labyrinth, but cannot see its layout. Some corridors of the tomb have a portal. Once the two characters pass through the portal they switch places: the Guide becomes the Muscle and vice versa. When treasure is found, the Muscle, who collects it, gets to keep twice as much as the Guide. But if a Monster is encountered, the Muscle has to bribe it with treasure to escape. The two players use different computers, and they navigate using a Kinect or a leap-motion sensor. One is shown the 3D world of the labyrinth while the other is shown a top-down view of a 2D map. Both players have a treasure indicator on the screen which shows their individual progress in collecting treasure. Both start at 0 and have to reach the end goal. Whoever reaches the end goal first is declared winner of the game. The players have to collaborate to collect treasure and avoid monsters lurking in the dark corridors of the tomb. However, they also compete against each other, each trying to collect more for themselves. Unequal Pay is a game mechanic designed to introduce the element of competition and a desire to switch roles. It dictates that one player (e.g. the Muscle) is rewarded higher for accomplishing a task (i.e. collecting a treasure piece) than the other. The mechanic of Switching Places, allows players to pass through a 3D Magic Portal, after which the character roles, gameplay, graphics and benefits are switched. As the weaker party at the end of the bargain (e.g. the Guide) is aware of when the opportunity to switch places presents itself, it's left up to the player to determine when to propose a bargain for the benefits to be exchanged. Likewise, it is up to the other player to evaluate the proposition and understand whether the offer was birthed out of a justified feeling of fairness or pure greed. A sense of trust must be built between both players in order for the game to be completed. In every move they are left to decide if they shall work together or if they want to go out for themselves.

Figure 2 – The Path of Trust Game

During the first phase of small studies, the Path of Trust game will be used as the context of three experiments (small studies #1-3 above), in order to collect data for: the gesture recognition algorithm; the facial expression analysis; the gaze analysis; the body motion analysis for ER; the data fusion algorithm, the adaptation algorithm; the evaluation of game usability; and, the platform technical validation

▪ **Kitty King's Candy Quest** is a web-based game designed to be played by two players on different computers. It focuses on decision points that deal with prosocial concepts of Fairness and Generosity. Players initially complete a short round of collecting candy by clicking fast on a candy jar. When the time is up, one player is assigned the role of the giver: this player gets all of the candy collected and has to decide how much to share with the other player. The receiver then decides if the sharing was done fairly. Finally, Kitty King invites both players to tell him how the feel about the sharing that took place, by speaking to the webcam. There are two variations of the game, all contained within the same set. In the first variation each players collects candy individually and then shares it with the other player. In the second variation they collect together the candy and then take turns doing the sharing. Thus the game is played four times, two times for each variation. The play is anonymous and the players are informed that they are teamed with a new partner in each round.

Figure 3 – Kitty King's Candy Quest

During the first phase of small studies the Kitty King's Candy Quest game will be used for validation of the central tenet of the ProsocialLearn concept. Namely to ascertain to what extent it may be possible to identify or measure prosocial intent or prosocial response through sensor data pertaining to voice, facial expressions etc. as captured through the webcam at the decision points of the game. In addition, Kitty King's Candy Quest will be used as a vehicle for creating a corpus of voice data in three different languages, that will be used in analysis for emotion classification .

▪ **The Cooperative Game** is based on cooperative mechanisms grounded on the theory of public goods game, that considers costs/benefits of decisions associated with collective or individual action. The game aims to explore the definition of a "Cooperation" prosocial domain including how to measure cooperation and observe emotional affect. The goal of the game is for players to transfer the maximum amount of resource to an end point of a path where the resources are converted to private and collective benefits. Each player starts with resources and it is fixed that half of these resources will contribute to the personal good that will be translated in personal benefit at the end of the game and the other half will contribute to the collective goods that will be converted into the global benefit. Players must work together to avoid threats that reduce goods (both public and private). The game has four players. It is a turn based game with two dices rolled each turn. The result of the dice may move each player, may move a threat or both of them. On each turn, one player is in charge of deciding how to use the results of the dice. The decision may lead to three classes of movement: an individual movement, a collective movement (maximising the collective benefit, for instance helping someone else), and a neutral movement. Each cooperative movement has a cost for a player. While the concept of cost is immediately clear to players, gaining an understanding that through cooperation the final benefit usually overcomes the cost will be part of the learning process. For instance the resource spent for performing a cooperative move may well be balanced by the fact that the move saves more resources belonging to another player, so globally preserving more Collective Goods.

- The roll of two bi-colour dice determines movement on board
- Player(s) (◯) always move first, if possible
- Threat (▲) moves next, if possible
- Each player takes it in turn to choose how to move the group along the path away from the threat
- If the threat lands on a player/players, their goods(◈) are stolen
- Moving others costs private good (◇), example:
  – Player 3 (◯) moves player 1 (◯) to avoid possible threat; this costs 1 unit for player 3
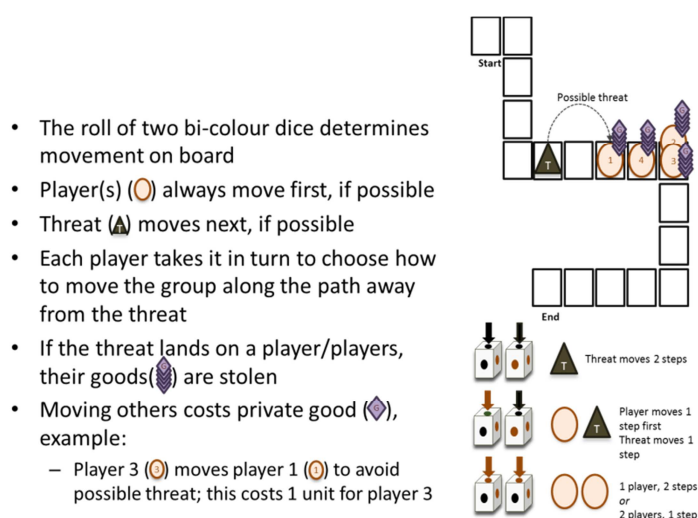
Figure 4 – Cooperation game logic

During the first phase of small scale studies the game will be used to study the effect of voice interaction on collaborative behaviour (small study # 7 above). The project will use additional information extracted from voice (i.e. emotions) as part of the prosocial state assessment. It is therefore crucial to understand if a correlation exist between voice interaction and prosocial behaviour. The game can be played in two different modalities: with or without voice activated. Without voice it is possible for individual decisions to be isolated, with voice a measure of influence will determine how much of the collective decision was related to a given player. The voice will be used also as a source of emotion observation, in conjunction with a game feature called mood

feedback collector, allowing players to provide feedback on their mood choosing from a finite set of options.

- **Video stimuli.** One of the studies planned in phase 1 will use **simple video stimuli** instead of a game, to collect data about identification of emotion and prosocial intent in **Expressive Virtual Characters**. This study will also explore the possibility of developing game scenarios around these expressive characters (study #4).

More information about the testing kits and details about the research procedure to be followed in each of the studies, are included in Appendix 5.

5.3 Planning the implementation of a Small-Scale Study

For the detailed planning of the small studies, a simple template has been developed (see appendix 2) for sharing information among the partners involved and for monitoring preparation. The table presented in section 5.1. above is based on that template.

In practical terms, the following prerequisites need to be fulfilled for each small study to be conducted:

- An experimental protocol will be prepared in accordance to a template similar to a standard research proposal (see appendix 1) and the protocol of ethical practices (see appendix 6).The experimental protocol will be used for completing all Ethics and DPA procedures necessary. The experimental protocol needs to be available at least three months before the trial date, for all the necessary procedures to be completed on time.
- Based on experimental site needs defined using the planning form, schools will be enlisted to participate, through community building activities (see section 4 above)
- Ethics clearance, DPA registration and all necessary permissions will be acquired in accordance to local regulations in each country. Experimental protocols may need to be adjusted accordingly.
- A summary will be prepared for participants, parents and teachers describing the game and the purpose of the research, in accordance to the protocol of ethical practices (see appendix 6). Other illustrative material (e.g. demos, videos) may be used if possible. Other teacher preparation activities (e.g. planning or training sessions) may take place depending on teacher role in each experiment.
- Informed consent forms (see appendix 6) will be gathered from participants and responsible adults (parents or legal guardians)
- Small-Scale experiments will be scheduled within school time constraints (generally, schools are not responsive to outside requests for time during the first and last month of the school year, or close to major holidays, but other local constraints may need to be taken into consideration).
- Small-scale experiments will be adequately supported on-site with equipment, software and personnel by the corresponding technical team, depending on the complexity and the maturity of the technology to be tested, the complexity of the research procedure, and the technical infrastructure of the schools. For example, our experience with preliminary testing, has suggested that to create the conditions necessary for those trials (e.g. ensuring anonymity among the players, appropriate briefing and debriefing, administering questionnaires and managing the flow of players in the experimental setup) four researchers were required to run the experiments.

- The technological components to be used are sufficiently developed and lab tested to ensure that the trial can take place in a school setting. Each testing 'kit' will be available for the teachers and educational researchers to familiarize themselves with at least a week prior to testing.

For the studies outlined in this section all these prerequisites are fulfilled or are currently in the process of being fulfilled through the actions of the partners responsible for each study.

6   Conclusions

The first object of the present task, the development of a strong community of teachers and schools across Europe who take an active interest in cultivating students' prosociality through games, is vital to the ultimate success of ProsocialLearn. Equally important is the second object of this task, namely the effective and ethical planning of ProsocialLearn empirical evaluation to ensure that the technological solution delivered will address the fundamental premise of this project: that it is possible to develop the necessary technical components and methodological approaches for creating digital games that foster prosociality, in order to catalyze a European market for prosocial digital games.

As it should be clear from this document, despite the necessary delegation into separate sections, these two aspects of the task are interrelated. A sustained collaboration with schools and teachers is necessary for conducting the necessary experimental trials. At the same time, these experiments aim to ensure that the ProsocialLearn games, game elements, back-end technologies and platform are all tailored to the needs primary school teachers and students. Other activities that involve the teachers, such as focus groups and an active online participation, will also serve both community building and formative evaluation of evolving ProsocialLearn technologies.

The success of this task involves building on the outcomes of all other technical WPs of the project, and achieving close collaboration of practically all partners. The conceptual formulation of the prosociality domains (WP2) and the development of ProsocialLearn technologies (WP3-6) all provide the inputs for community building activities and experimental studies, which in turn inform that work with essential end-user feedback. If the collaboration in producing the present document is any indication, the ProsocialLearn consortium is up to managing this complexity.

It follows that community management and experimental planning will evolve with the overall progress of the project and adjust accordingly. While our overall strategy is set in this document, specific plans will be put to practice and then revised and expanded in accordance to the needs of the project. The two subsequent versions of this deliverable will document this process.

7 References

[1] Darren Cambridge, Soren Kaplan, and Vicki Suter, *Step by Step Guide for Designing and Cultivating Communities of Practice*, 2005, available at http://net.educause.edu/ir/library/pdf/nli0531.pdf (accessed on the 20th September 2015)

[2] Etienne Wenger, Richard McDermott, & William Snyder, *Cultivating Communities of Practice: A Guide to Managing Knowledg*e, Boston, MA: Harvard Business School Press, 2002

[3] Florian Lingenfelser, Johannes Wagner, Elisabeth André, Gary McKeown, and Will Curran. 2014. An Event Driven Fusion Approach for Enjoyment Recognition in Real-time. In *Proceedings of the ACM International Conference on Multimedia* (MM '14). ACM, New York, NY, USA, 377-386.

[4] Zixing Zhang; Coutinho, E.; Jun Deng; Schuller, B., "Cooperative Learning and its Application to Emotion Recognition from Speech," in Audio, Speech, and Language Processing, IEEE/ACM Transactions on , vol.23, no.1, pp.115-126, Jan. 2015

[5] S. Steidl, Automatic Classification of Emotion-Related User States in Spontaneous Children's Speech, Logos Verlag, Berlin, 2009

Appendix 1 – ProsocialLearn Community Bulding; phases and activities

1. Inquire (M9-15) Identify the audience, purpose, goals, and vision for the community	
Key questions to explore	Supporting activities
- Audience: who is this community for? Who are the community's important stakeholders? - Domain: Given the intended audience, what are the key issues and the nature of the learning, knowledge, and tasks that the community will steward? - Purpose, Goals, and Outcomes: Given the audience and domain, what is this community's primary purpose? What are the benefits to the stakeholders? What specific needs will the community be organized to meet?	1. Conduct a needs assessment through informal discussions, formal interviews, surveys, and/or focus groups. 2. Define the benefits of the community for all stakeholders, including individual sponsors, individual community members, defined subgroups, the community as a whole, and the sponsoring organization. 3. Create a mission and vision statement for the community, tying these into the sponsoring organization's mission and vision if appropriate. 4. Identify the major topic areas for community content and exploration. 5. Create an estimate of the cost for community technology, special technical development, facilitation, and support. 6. Begin the recruitment of a core team of individuals who represent the community audience.
2. Design (M9-15) Define the activities, technologies, group processes, and roles that will support the community's goals	
Key questions to explore	Supporting activities
- Activities: What kinds of activities will generate energy and support the emergence of community presence? What will the community's rhythm be? - Communication: How will members communicate on an ongoing basis to accomplish the community's primary purpose? - Interaction: What kinds of interactions (with each other and with the content of the community) will generate energy and engagement? - Learning: What are the learning goals of the community, and how can collaborative learning be supported? - Knowledge Sharing: What are the external resources (people, publications, reports, etc.)	1. Identify tasks that community members are likely to want to carry out in the community. 2. Develop a series of scenarios that describe various synchronous and asynchronous experiences of the different personas (identified in the first phase) that would be necessary to carry out the tasks and that demonstrate the potential benefits defined in the first phase. 3. Identify any face-to-face meeting opportunities for community members and define how these will be incorporated into the community experience (conferences, etc.). 4. Lay out a tentative schedule for the community (weekly, monthly, quarterly, and/or annually),

that will support the community during its initial development? How will members share these resources and gain access to them? ▪ Collaboration: How will community members collaborate with each other to achieve shared goals? ▪ Roles and Social Structures: How will community roles be defined (individuals, groups, group leaders, community administrators, etc.) and who will take them on	5. Create a timeline for the community's development. 6. Create a directory or folder structure for organizing discussions, documents, and resources. 7. Determine facilitator roles and recruit the first community facilitator(s)

3. Prototype (M16-24) Pilot the community with a select group of key stakeholders to gain commitment, test assumptions, refine the strategy, and establish a success story.	
Key questions to explore	Supporting activities
▪ What short-term pilot goals will help establish the community as a viable and valuable entity? ▪ What community-oriented technologies will be used to support the pilot community's social structures and core activities? ▪ What sort of brand image does the community want to project, given its audience, domain, purpose, and mode of operation? ▪ What are the meaningful metaphors to use with the community's audience? ▪ What is the tone of interactions and activities that facilitators want to model? X How will community identity be formed and shared? ▪ How will success be measured and communicated to the broader stakeholder groups?	1. Select the most appropriate community-oriented technology features to support the goals of the pilot. 2. Design the community environment and have a group test the functionality through case scenarios. 3. Decide on the community metaphor and how it will be represented in the community's organization and appearance. 4. Implement the community prototype and give access to the core team and pilot audience. 5. Seed the community with content. 6. Facilitate events and activities to exercise the prototype, focusing on achieving short term value added events. 7. Ensure that roles are clear and that support structures are in place. 8. Measure success and report on the results of the prototype to sponsors and stakeholders.

4. Launch (M16-24) Roll out the community to a broader audience over a period of time in ways that engage new members and deliver immediate benefits	
Key questions to explore	Supporting activities
▪ Why should someone join the community? ▪ What are the benefits? ▪ What is the business model behind the community? ▪ How do new members learn about the community?	1. Using experience and results from the prototype, design and implement the community environment (include graphics that support the community metaphor, predefined content from a variety of sources, prepopulated online discussions, links,

▪ What are the community's norms for behavior? ▪ How do new members become oriented to the community environment? ▪ Based on insights from the pilot, what kinds of community activities will generate energy and engagement and support the emergence of community "presence" (activities, communication, interaction, learning, knowledge sharing, collaboration, roles and social structures)? What will the community's "rhythm" be? ▪ Based on insights from the pilot, how will roles and community social structures be defined and supported over time? ▪ How will success be measured?	databases with best practices and other information, online meeting spaces, etc.). 2. Establish the community charter, which includes an articulation of the mission, vision, goals, and member norms and agreements. 3. Define various roles available for community members, depending on their desired level of participation, goals, and previous experience. 4. Implement communications and marketing plans. 5. Determine the member profile/directory structure. 6. Recruit new members. 7. Set up new member accounts or enable self-joining membership and group affiliations. 8. Provide synchronous welcome to new members when they first log in. 9. Provide orientation to new members. 10. Finalize and publicize a community calendar of events. 11. Design and deliver synchronous and asynchronous events and activities. 12. Set up communication channels (news, announcements, newsletters, integration with face to-face meetings, etc.)

5. Grow (M16-24) Engage members in collaborative learning and knowledge sharing activities, group projects, and networking events that meet individual, group, and organizational goals while creating an increasing cycle of participation and contribution.

Key questions to explore	Supporting activities
▪ What are the emerging benefits of the community for members, subgroups, and the community as a whole, the community's sponsors, and other key stakeholders? ▪ What are the emerging roles that one could play within the community? What are the different groups to which one could belong? ▪ How do members get recognized and rewarded for their contributions? ▪ How do members create their own community identity and presence? ▪ What work products can members contribute to support individual and community goals?	1. Continue implementation, including facilitation and communication. 2. Create and share stories of individual and community successes (e.g., digital stories) to capture best practices and create excitement and momentum. 3. Identify emerging community roles and recruit members to fill them. 4. Create and assign members to subgroups to support emerging group activities. 5. Conduct a resource inventory (freshness, relevance, usefulness, use) then identify and

▪ What are the most important elements of community culture that are emerging that should be recognized and represented in the online environment, as well as in formal policies and procedures? ▪ What are the emerging technical needs of the community environment (e.g., the community oriented technology/platform and the "place" that it creates) to support the evolving purpose, processes, and community culture?	upload additional content to meet the community's needs. 6. Create opportunities for sponsored projects (projects with defined work products that may or may not require additional commitments from community members and sponsors). 7. Design activities with recognition and awards attached to encourage desired behavior and participation. 8. Conduct focus groups, interviews, surveys, and other data collection activities to assess and measure the success of the community. 9. Facilitate discussions about the community itself, including the community culture, processes and practices, technology, and individual motivations for participating in the community.

6. Sustain (M25-30) Cultivate and assess the learning, knowledge, and products created by the community to inform new strategies, goals, activities, roles, technologies, and business models for the future.	
Key questions to explore	Supporting activities
▪ What are the ongoing community processes and practices that will contribute to the liveliness and dynamism of the community and keep members engaged? ▪ How does the community support members across a wide range of roles? ▪ How are new potential community leaders (official and unofficial) going to be identified, chosen, developed, and supported by the community? ▪ How is persistent community "presence" maintained in the minds of the community members? ▪ To what extent is the community serving its intended audience and accomplishing its stated purpose and goals? How might it do a better job? ▪ How does the community demonstrate return on investment (ROI) for its sponsor(s)? ▪ From the perspective of each individual community member and from that of the community as a whole, what is the perceived	1. Provide opportunities in the community for members to play new roles, experiment with new community activities, and examine new technology features. 2. Develop a support infrastructure including documentation, mentoring, and development as well as recognition programs for different roles. 3. Ensure that procedures, practices, and the technology support structured data sharing. 4. Identify opportunities for capturing new knowledge, including establishing new roles related to harvesting and creating best practices (e.g., "gardeners," summarizers, synthesizers). 5. Develop policies and processes for harvesting and sharing knowledge outside the community. 6. Encourage publication of articles about the community and its projects. 7. Test for "persistence of presence" by evaluating member and group activity reports as well as member focus groups and

return on participation? ▪ How should the knowledge and products created by the community be shared beyond the community?	surveys. 8. Review community audience, purpose, goals, and domain; watch for shifts in expectations and needs.

Appendix 2 – Planning Documents for Small Studies

Small Studies Planning Template

#	Evaluation of…	Technical Partner(s)	When	Where	~# of Players	Testing 'Kit' /Game	Protocol	Ethical Review - DPA Registration
01	[What is the purpose of the experiment?]	[who will provide the technologies and use the data from the experiment]					Y/N	Y/N
02								
03								
04								
05								

Small Studies Experimental Protocol Template

ProsocialLearn: Experimental Protocol for [what study]

1. Purpose of the Evaluation

[General Goal, Research Questions, List of Objectives go here. The specific formulation depends on the study]

2. Study Responsibility

[Who will conduct the Study]

[Who is the Data Controller]

[Who is the Data Processor]

3.   Description of the Game/Task

[If technologies are integrated into a game describe the game. If not integrated into a game, describe the users task and the interface with which they will interact]

4. Setting and Participants

[Location,

Number, characteristics and division of participants

Researchers present

Technical setup

Overall duration of each trial

Dedicated project hardware or hardware requirements]

5. Experimental Procedure

[participant briefing, group formation, game session, activities other than the game session, participant debriefing, etc.]

6. Data Collection

[Data will be collected automatically, through the devices used. Data collected non-automatically if any, (e.g. questionnaires, researcher notes, interview recordings). Data storage]

7. Data Analysis

[How will the data collected above will be used: e.g. to create profiles, to train algoriths, to identify indicators of PSL, to measure QoE, etc. How and by whom will this analysis be conducted]

8. Ethical and Personal Data Protection Provisions

[anonymity and secure storage (in detail about everything mentioned in the Data Collection and Analysis sections above)

appropriate briefing and consent of participants and/or responsible adults

protection from distress/harm during the trial

right to withdraw

etc.]

Personal Data Protection and Ethical Procedures Checklist

Prior to the study

☐ Research protocol internally reviewed by the EMB and revised if needed

☐ DPA paperwork filed in all countries where the study will be conducted

☐ Appropriate Ethics permissions obtained at the national level in all countries where the study will be conducted

☐ Participating schools fully informed about the study, including purpose, time and effort required and data collection

☐ Appropriate permissions obtained at the school or school system level, if needed

☐ Information about the study sent to parents and legal guardians of participating children and informed consent forms returned

On the day of the study

☐ Potential participants asked explicitly if they want to participate after they are briefed about the study, emphasizing that participation is voluntary and that they can withdraw at any time

☐ Periodically checking for signs of tiredness or distress checked during the experimental procedure and offering participants the option to stop if that occurs.

After the study

☐ Data stored securely according the project guidelines

☐ Participants debriefed

Appendix 3 – Workshop material for teacher induction workshops

1st ProsocialLearn workshop, Pallini, Greece

ProsocialLearn: introduction to prosociality & prosocial learning games

EDEN OPEN CLASSROOM CONFERENCE, 19-09-2015, 14.00-16.00

The workshop initiates educators to the ecosystem of prosocial games by offering a theoretical framework and engaging the audience to the process of design and development of learning activities corresponding to certain prosocial features.

As such, trainees are introduced to:

a) the rationale of prosociality (i.e. what do we mean by prosocialilty, its impact on learning style, how it is related to inclusion and better academic achievements, why we should integrate it to our pedagogical approach) and

b) prosocial learning games (i.e. how prosocial skills are related to certain gameplay examples).

Aims and objectives of the activities

- Familiarization of participants with prosociality and prosocial game ecosystem
- Identification of the relation among prosocial skills, social inclusion, individual empowerment and success in formal education
- Presentation of a prosocial game and mapping of prosocial skills, so that participants have a first-hand experience of the respective activities
- Design of prosocial activities by the workshop participants, so as to establish a community of interest that will work together under the framework of prosociality during and after the lifetime of the project.

Agenda

- Welcome & Introductions (10 minutes)
- Presentation of ProsocialLearn (10 minutes)
- What is prosociality and how it is related to inclusion and better academic achievements (15 minutes)
- Prosocial and Educational games (categories, types) (15 minutes)
- Hands on Activities; presentation of a prosocial game; feedback from participants on improvement suggestions (30 minutes)
- Group activity; participants work together and design activities targeting certain prosocial traits (30 minutes)
- Conclusions and next steps (10 minutes)

For information and expression of interest contact Evangelia Dimaraki [contact info provided] & Anna Zoakou [contact info provided]

2nd ProsocialLearn workshop, Verona, Italy

Location: Hotel Aqualux – Bardolino (Verona)

Trainers: Evangelia Dimaraki - Greece Stefano Cobello – Polo Europeo della Conoscenza

Workshop Objectives

This is an introductory workshop for teachers, teacher trainers and school administrators interested in becoming 'Prosociality Ambassadors' in their school communities in the context of the ProsocialLearn project.

Participants will:

- develop their understanding of the concept of Prosociality and the attitudes and behavior it encompasses
- develop their understanding of the game-based approach to learning
- familiarize themselves with digital games that promote prosocial objectives
- apply prosocial learning objectives to the design of game-based learning activities

Workshop Agenda

- 9.00 Registration Participants
- 9.30 Welcome & Greetings
- 9.45 sub-partners short presentation
- 10.15 Presentation of ProsocialLearn project
- 10.30 What is prosociality and how it is related to inclusion and better academic achievements
- 10.45 Social values and school environment (project Community)
- 10.55 Prosocial and Educational games (categories, types)
- 11.10 Hands on Activities; presentation of a prosocial game; feedback from participants on improvement suggestions
- 11.40 Group activity; participants work together and design activities targeting certain prosocial traits
- 12. 10 Conclusions and next steps
- 12.25 End of the workshop

For Information write to Stefano Cobello [contact info provided]

Reference table: Prosociality Concepts

Prosociality Domain	Indicative Learning Objectives	Indicative Game Elements
Empathy	• correctly identify the emotions of others • accurately describe the cause and effect of emotions • relate to the emotions of others • respond appropriately to the emotions of others	• narrative games with keywords that correspond to emotions • having to guess the thoughts and feelings of characters in a scene • having the option to "read the mind" of characters • interacting with characters based on their emotional states in the game in order to advance a storyline • role playing that put the player "in the shoes" of different actors in a situation • characters with rich personal stories
Compassion	• notice misfortune and difficulties of others around them • adopt an open-minded, non-judgmental attitude toward others who make mistakes or experience failure • recognize mistakes and failure as a common human experience shared by all • offer help and support in the face of misfortune and suffering • extend the same attitude and response towards oneself as well when facing failures and difficulties (self-compassion)	• opportunities to offer help or support to an in-game character or a co-player • having to care for a helpless creature under their protection (a pet, a baby etc) • "guardian angel" feature: in-game character or co-player who gives unexpected help when a player is in a losing position or makes a wrong move in the game (being on the receiving end of compassion) • characters with rich personal stories

Trust	• demonstrate the reasonable level of trust, based on the honesty, kindness and reliability of others • assess the trustworthiness of their own behavior (honesty, kindness, reliability) • be able to trust others enough in the pursue of shared goals	• trust is necessary for the successful completion of the game (e.g. alliances, exchanges etc.) • player must delegate tasks to other players or in-game characters • player must decide if and whom to believe • games provides information that can be used to judge the trustworthiness of each character or player • players gain or lose trustworthiness points, depending on their behavior in the game
Cooperation	• choose to do a task together with others rather than solo • work towards the success of the group, rather than just personal success • resolve disagreements and reach consensus about the means and ends of a shared endeavor • distribute efficiently tasks and resources among team members to achieve a goal • contribute effort and resources to the common good	• playing in teams: cooperation within the team, competition with the 'opposite' team • players need to coordinate (e.g. in physical actions or puzzle-solving moves) to advance in the game • a shared pool of resources: players contribute to the pool and can draw from it when they are in need • interdependence: the success of each player depends on the success of all; for example all players lose points if one player lags behind too much • players have only a piece of the solution each • collaborative storytelling, e.g. in a role-playing game

Fairness	• share possessions and resources fairly and equally • act fairly in situations of inequality, even when in an advantageous position: act to correct injustice • act fairly in situations of inequality, even when in an disadvantageous position	• games of sharing, racing or resource management, with either an equal or an unequal starting point • clear negative consequences for acting unfairly in the game • scrupulously fair distribution of a resource is necessary for the advancement of the game (e.g. players need to have the same number of golden keys each to open a gate)
Generosity	• offer help to others without expecting something in return • share with others resources and possessions that are personally valuable • give to someone in need, even when personal funds are limited • offer gifts without expecting something in return • support the efforts of others, even though there is no immediate personal benefit or profit	• opportunities to offer something that advances the game with no personal gain (e.g. in a storytelling game with cards, offer a card that advances the story of another player) • the option to help a new player enter the game: for example, by offering information, tokens, cards etc. • the option to share information, tokens, cards etc. with chosen players at specific points in the game • the option to 'save' a player who is about to lose or get kicked out of the game • "benefactor" feature: in-game character or co-player who offers unexpected gifts or support (being on the receiving end of generosity)

ProsocialLearn: Power point presentation

Gamification of Prosocial Learning
for Increased Youth Inclusion and Academic Achievement

1

Gamification of Prosocial Learning
for Increased Youth Inclusion and Academic Achievement

What is ProsocialLearn

2

What is ProsocialLearn …

… a three year EU project within the Horizon 2020 framework, running from January 2015 through December 2017 aiming:

- to provide game developers with necessary means for creating digital games that foster prosociality, i.e. that have positive impact on social behavior of children

- to catalyze an increase in the number of prosocial digital games that are available for use in European Schools and tailored to their needs

- to create a european market for prosocial digital games

ProsocialLearn workshop   3

What we are about…

- we want more of the digital games that children play for fun and for learning to promote prosociality: fairness, generosity, trust, cooperation, empathy, compassion

- we aspire to develop and make available to game developers prosocial game elements that can be integrated in many different game types

- we plan to demonstrate and test prosocial game elements by developing some games to be used in schools

- we aim to create a community of teachers who take an active interest in cultivating students' prosociality through games

ProsocialLearn workshop   4

Playing Prosociality …

… a simple game in groups of three

- each player in turn shares a story (1'-2') about a recent event from everyday life

- the storyteller writes secretly on a card a key emotion of the narration

- the other players write secretly on their cards what emotion they attributed to the storyteller

- players show their cards and discuss the emotions they have written: players earn points for guessing emotions correctly

ProsocialLearn workshop   5

ProsocialLearn

**Gamification of Prosocial Learning
for Increased Youth Inclusion and Academic Achievement**

What is Prosociality

6

What is prosociality;

- Prosocial practices include: altruism, cooperation, care for others, expression of sympathy, alleviating suffering, gratitude
- Prosocial practices focus on the common good and the well-being of the community, rather than narrow self-interest
- A prosocial response is a choice that does not depend on expected outcomes for the individual (positive, neutral or negative)
- Helping, sharing, consoling and cooperating, are values in themselves, independent of rewards or reciprocation

Prosocial ≠Antisocial

ProsocialLearn workshop   7

Core Domains of Prosociality: Empathy and Compassion

Empathy

How can I learn to identify, relate, and respond appropriately to the emotions and circumstances of others?

Compassion

How can I avoid being too judgmental and recognize mistakes and failures as a common human experience shared by all

How can I express my compassion to others and to act in a way that will alleviate their difficulties?

How can I learn to receive the compassion that others express towards me when I face difficulties?

How can I learn to be compassionate to myself when I fail or make mistakes? (self-compassion)

ProsocialLearn workshop   8

Core Domains of Prosociality: Trust and Cooperation

Trust

How do I know whom to trust and when to trust?

How do I become worthy of trust?

Cooperation

How do I develop shared goals and plans with others and coordinate to pursue difficult tasks that are personally and communally beneficial?

ProsocialLearn workshop   9

Core Domains of Prosociality: Fairness and Generosity

Fairness

How do I share fairly in assigning effort and distributing goods?

How do I react fairly in situations of inequality?

How do I advocate for a fair solution?

Generosity

Can I learn to share my valuable possessions with others?

Can I offer gifts or help, without expecting something in return?

Can I support the success of others without any selfish reason?

How can I learn to receive the generosity of others?

ProsocialLearn workshop   10

Emotional Intelligence and Prosociality

Emotional Intelligence is a related framework that encompasses prosocial competencies and practices.

Main components of emotional intelligence:
• Awareness of emotions in self and others
• Expressing emotions
• Using emotions to facilitate thought
• Understanding emotions
• Regulating emotions

ProsocialLearn workshop   11

On the development of Prosociality

• The foundations of prosocial behavior are laid at the age of 18-24 months, when children start to cooperate, share, help
• At the same age they also begin to become affected by the feelings of others
• The development of empathy is strongly related to the development of a sense of self during the second year of life, as children begin to differentiate self from other
• Gradually the emotional discomfort experienced in the presence of unhappiness is differentiated into compassion for others (Craig & Baucum, 2007).

ProsocialLearn workshop   12

**Gamification of Prosocial Learning
for Increased Youth Inclusion and Academic Achievement**

Education for Prosociality: Examples

13

ProSAVE

ProSAVE is a project to prevent the phenomena of 'social violence' amongst peers, by creating and applying a set of innovative methods based on prosociality . It provides specific methodologies for educators and other social actors (parents, indirect educators and policy makers).

Through ProSAVE teachers and students have opportunities to:
- participate in collaborative activities, share and work towards common goals
- understand their emotions and express themselves in a positive way to others
- give priority to happiness and well-being of themselves and others

Evaluation results (pre-and post- drawings and social graphs) show that:
- relations among students were visibly improved
- students became closer to their fellow students and to themselves
- the social dimension of education was emphasized over the cognitive/academic dimension

ProSAVE teaching material available at http://www.era-edu.com/csfvm/ProSAVE/

ProsocialLearn workshop   14

code: EVERYBODY'S GOT A SPECIAL TALENT

Helping a student to be self-confident implies appreciating his/her positive qualities, helping him/her to get to know one self and to recognize one's own abilities.

ACTIVITY: THE QUALITY STAR

Sample ProSAVE activity

ACTIVITY	Enhancement game
OBJECTIVE	Increase the ability to enhance others
LOCATION	Classroom
SCHEDULE	min 20 minutes.
MATERIALS	Paper, felt pens, a card with the drawing of a star
DEVELOPMENT	The students are divided into groups of five and set in a circle. Each student chooses a felt pen and writes his/her name in the centre of the star and a quality in one of its points. He/she then passes the star on to the friend sitting at his/her right who in turn writes down another quality. To be completed, the star must be go round twice. The owner of the star will be happy to read the list of qualities written on it.
USEFUL TIPS	Once the activity is finished, the stars can be hang on windows, walls, ceilings.
WEB	Italian – Arts – Constitution and Citizenship
ANALISYS AND ASSESSMENT	The objective is reached when the students try to express the qualities they have been given.
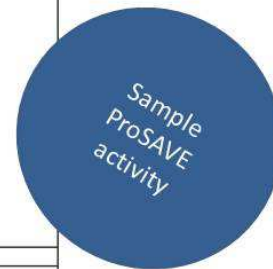
ProsocialLearn workshop   15

Prosociality Sports Club

Prosociality Sports Club aimed to support school diversity and integration of student groups at risk of marginalization and early drop-out. It used sport as a vehicle to teach social and emotional competences and to establish a set of principles for acceptance, mutual understanding and respect .

Evaluation results show that students developed the following competencies:
- communication
- empathy
- respect for diversity
- emotional intelligence
- cooperation
- goal-orientation and commitment

Teachers reported as most valuable the collaboration with other culturally diverse schools to have students work towards a shared goal

The project movie is available at: https://www.youtube.com/watch?v=BgwUL_-K22s

ProsocialLearn workshop   16

ProsocialLearn

Gamification of Prosocial Learning
for Increased Youth Inclusion and Academic Achievement

Playing for Prosociality

17

play is...

play is a form of **freedom** ⇒ **voluntary** and **for its own shake**

play is **separate from 'ordinary' life** ⇒ **'make believe', imaginative**

play commands the **player's full attention** ⇒ **immersive, engaging**

play has specific **boundaries in time and place** ⇒ **a context**

play has **rules** ⇒ a sense of **order**

play defines for players a **social group** ⇒ **an identity**

(based on Johan Huizinga, *Homo Ludens*)

ProsocialLearn workshop   18

play vs. game

A player enters voluntarily into a rule-based, well-defined, 'make-believe' world...

... to **explore**, to **experiment**, to **create** $\Rightarrow$ play

... to complete **assignments**, to defeat **opponents**, to win **trophies**, to reach **targets** $\Rightarrow$ game

game = goal-driven play

ProsocialLearn workshop   19

why game-based learning

motivation, personally meaningful goals

mastery, identity

imaginative perspectives

dramatic significance

high challenge, safe fail

sustained engagement, flow

playfulness, exploration

collaboration and competition

contextual bridging

complex problems, systems thinking

ProsocialLearn workshop   20

adding 'game-based' to 'learning'

- **Gamification** – motivational game elements added to regular learning activities (scores, badges, leaderboards etc.)
- **Trigger Games /Mini-games** – short (e.g. 5') games to be played in order to introduce an idea or a problem and trigger discussion, problem-solving or inquiry
- **Curriculum Games/Learning Games** – the curriculum is embodied into the game (though not all learning necessarily happens in the game)
- **Overarching Game Worlds** – role-playing games or gameful social media: a content free make-believe world serves as an umbrella for various learning activities for a extended period of time
- **Game Design** – learning through making games

ProsocialLearn workshop   21
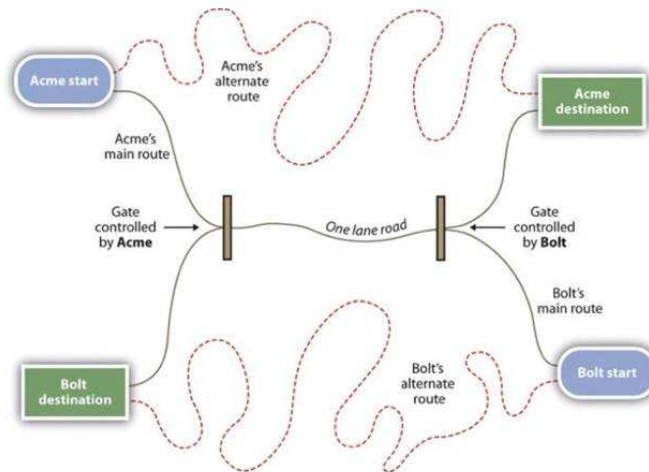
Electric Company - Feel Electric

ProsocialLearn workshop   22

Acme-Bolt Trucking Game

http://www.mosaicsciencemagazine.org/pdf/m06_05_75_04.pdf

ProsocialLearn workshop   23

Hate Comes Home

http://willinteractive.com/products/hate-comes-home
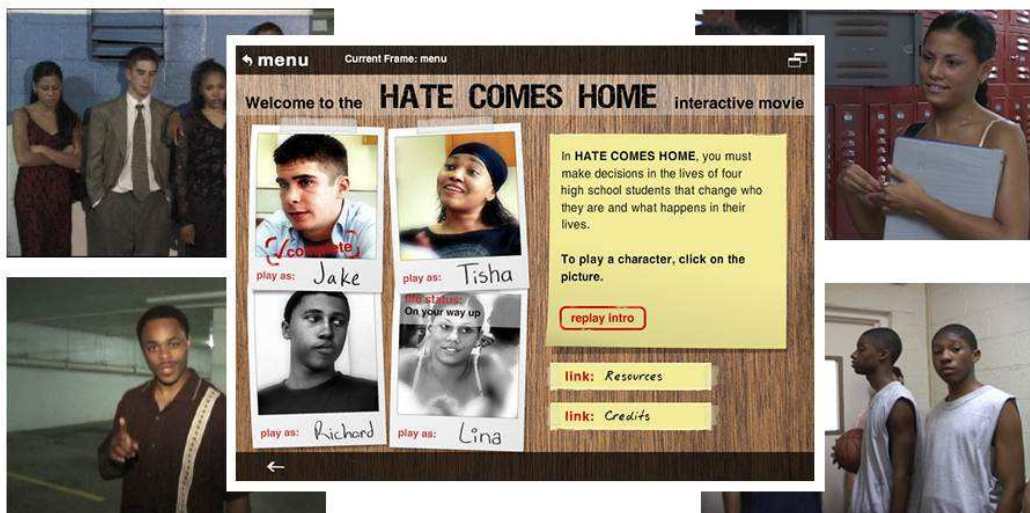
ProsocialLearn workshop   24

early experimental games
from the ProsocialLearn project

Path of Trust

ProsocialLearn workshop   25

Path of Trust

- Two explorers, the Brain and the Muscle , enter an ancient labyrinth to find hidden treasure. The Muscle carries the Brain on his shoulders.

- The Brain can see the labyrinth and give instructions but doesn't have the strength to move around. The Muscle can run in the labyrinth, but does not know what lies ahead in his path.

- When they find diamonds, the Muscle gets twice the share of the Brain

- When they encounter monsters, the Muscle must pay some of his diamonds to escape.

- In the labyrinth there are portals that reverse the roles: by going through a portal, the Brain becomes the Muscle and vise-versa

- The game ends when players collect all the diamonds or run out of time.

ProsocialLearn workshop   26

Path of Trust

- Prosociality domains: trust and cooperation
- Played with two players on different computers
- Can be played with motion sensors, or with simple arrow keys
- The game requires cooperation between the players in order to collect the treasure and to avoid the larking monsters
- Yet, there is competition, as each player tries to collect the most.
- In every move, the players need to decide if they will collaborate or if they will think only of themselves.
- This affects the trust between the co-players
- Ideally players will choose cooperation and reach the end of the game roughly with the same score

ProsocialLearn workshop   27

Path of Trust:
Reflection and Elaboration

- Could a game like this be used in the classroom, to teach about trust and cooperation?

- How could you integrate it into the learning process?

- What activities surrounding the game would need to be designed?

- How could this game be improved or modified to make it more useful for classroom use?

- Could you attempt to outline a lesson plan centering on this game?
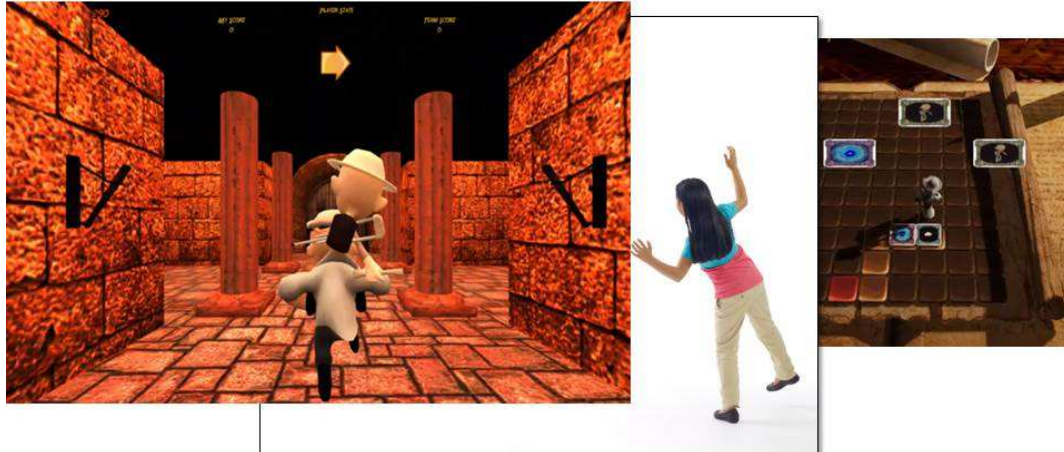
ProsocialLearn workshop   28

early experimental games from the ProsocialLearn project

Kitty King's Candy Quest

ProsocialLearn workshop   29

Kitty King's Candy Quest

- Prosociality domains: fairness and generosity
- Played with two players on different computers
- They collect candy from a jar, by clicking fast
- When the time is up, one of the players gets all the candy to share
- The other player decides if the sharing is fair
- The game is played four times, 2x2versions:
  - v1: the players take turns collecting and sharing the candy
  - v2: they collect together the candy and then take turns doing the sharing
- At the end of each round they comment on their experience

ProsocialLearn workshop   30

Kitty King's Candy Quest: Reflection and Elaboration

- Could a game like this be used in the classroom, to teach about fairness and generosity?

- How could you integrate it into the learning process?

- What activities surrounding the game would need to be designed?

- How could this game be improved or modified to make it more useful for classroom use?

- Could you attempt to outline a lesson plan centering on this game?

ProsocialLearn workshop   31

Design a game-based activity

- Take a piece of paper from the hat

- Written on each paper is a pair of prosocial competencies:
    - Empathy-Compassion
    - Trust– Cooperation
    - Fairness– Generosity

- In your group brainstorm and list playful activities to foster the selected pair of prosocial competencies

- What learning objectives would you choose to set?

- In what school subject(s) could you incorporate such activities?

- How would you evaluate the effectiveness of such an educational intervention?

ProsocialLearn workshop   32

Appendix 4 – School Community Questionaire

ProsocialLearn Questionnaire

Target audience: school Headmaster / teacher participating in the pilot phase

Estimated time for completion: 20 minutes

I. Generality about the school

1. Type and name of primary school: …………………………….

2. Which of the following definitions best describes the community in which your school is located? Tick one box only

   □   A village, hamlet or rural area (fewer than 3 000 people)

   □   A small town (3 000 to about 15 000 people)

   □   A town (15 000 to about 100.000 people)

   □   A city (100 000 to about 1 000 000 people)

   □   A large city (over 1 000 000 people)

3. Number of teachers: …………………..

4. Number of pupils: …………………………..

5. As a percentage, how many students in your school come from deprived homes? Tick one box only

   □   0 to 10%

   □   11 to 25%

   □   26 to 50%

   □   More than 50%

6. As a percentage, how many students use a different language at home from that used in lessons? Tick one box only

   □   0 to 10%

   □   11 to 25%

   □   26 to 50%

   □   More than 50%

7. Has your school participated or is currently participating in any type of educational program?

   □   Yes

   □   No

If you replied yes, please, briefly describe this/ these program(s):

II. Students' behavior

8. Have you ever experienced incidents of bullying, exclusion, aggressive behavior among peers in your school?

   □ Yes

   □ No

   If you replied yes, please, briefly describe your actions:

III. Information and Communication Technology (ICT)

9. In your school, is it supported the use of digital content in teaching practice?

   □ Yes

   □ No

10. Do teachers use ICT in their daily teaching?

    □ Yes
    □ No

    If you replied yes, identify what type of ICT is used in your daily teaching program:

11. Is your school connected to the Internet?

    a. Yes
    b. No

    If you replied yes, identify which internet connection speed best describes the one that your school receives from the telecom provider?

    Tick one box only

    □ 144kbps (excl.) – 2mbps (incl.)

☐ 2mbps (excl.) – 5mbps (incl.)

☐ 5mbps (excl.) – 10mbps (incl.)

☐ 10mbps (excl.) – 30mbps (incl.)

☐ 30mbps (excl.) – 100mbps (incl.)

☐ >100mbps

12. By which of the following means does your school mainly has access to the Internet? Tick all boxes that apply to your case

☐ ADSL

☐ Cable

☐ Fibre optic

☐ Wireless LAN

☐ Satellite

13. Who maintains the ICT equipment in your school? Tick the correct row

	Yes	No
The school's own staff		
An external company contracted by the school		
An external unit arranged by educational authorities (at local, regional level, etc.)		
Other		

14. This school year (2015-2016), does your school have any of the following?
Tick all the correct rows

	Yes	No
Its own homepage or website, publicly accessible		
School email addresses for more than 50% of teachers		
School email addresses for more than 50% of students		
A LAN (local area network)		
If yes, is this LAN also wireless (wifi)?		

A virtual learning environment (i.e. platform or knowledge management system, etc. possibly hosted externally)		
If yes, please, name the platform(s)		
If yes, can it be accessed from outside the school		
– By the students?		
– By the teachers?		
– By the parents?		
– Outside school hours?		

15. Does your school have a computer lab?

   □ Yes

   □ No

   If you replied yes, identify the number of PCs/ tablets etc.: …………….

16. Does your school have any other type of equipment (i.e. projector, interactive boards)?

   □ Yes

   □ No

   In case you replied yes, please identify the number and type of equipment:

17. How would you describe the overall computer literacy of the school's personnel? Tick one box only

   □ Basic

   □ Intermediate

   □ Proficient

18. How would describe the overall computer literacy of pupils? Tick one box only

   □ Basic

   □ Intermediate

   □ Proficient

Thanks a lot for your participation!

Appendix 5 – Experimental Protocols for Phase 1 Small-Scale Studies

Experimental Protocol for Studies 1-3, using the Path of Trust Game

1. Purpose of the Evaluation

The main objective of this study is to assess the performance of the first version of the platform and its modules. More specifically, a series of small scale experiments will be launched in operational or near operational school conditions in order to collect data for the evaluation of different modules, (such as gesture recognition, facial expression analysis, gaze analysis, body motion analysis, data fusion and adaptation), the validation of the platform's functionalities as well as the evaluation of the game effectiveness.

2. Study Responsibility

CERTH will conduct these three studies, in collaboration with EA.

CERTH, ATOS and EA will be data processors for these studies.

CERTH will be the data controller for these studies

3. Description of the Game/Task

Path of Trust (PoT) is a cooperative game where two players take on the role of two adventurers who venture into an ancient labyrinth-like tomb to uncover the treasure hidden within. The objective is to collect treasure while navigating through a maze, avoiding mummies and traps. One player (henceforth referred to as the Muscle), can run through the maze represented as a 3-D world, but cannot see what lies ahead. The other (henceforth referred to as the Guide, who is represented as riding on the shoulders of the Muscle) is unable to move directly, but can use a top-down view of a 2D map to navigate both of them safely through the maze. Both players have a treasure indicator on their screen which shows their individual progress in collecting treasure. Both start at 0 and have to reach the end goal. Whoever reaches the end goal first is declared winner of the game.

The two players have to collaborate to collect treasure and avoid dangers. They collect treasures (represented by diamonds) by having the Muscle touch them as he passes through the maze-like corridors. If they encounter a mummy, the munmy takes away one treasure point from the Muscle. Unequal Pay is a game mechanic designed to introduce the element of competition and a desire to switch roles. It dictates that one player (the Muscle) is rewarded higher for accomplishing a task (i.e. collecting a treasure piece) than the other. Further, the mechanic of Switching Places, allows players to pass through a 3D Magic Portal, after which the character roles, gameplay, graphics and benefits are switched. Both players are expected to realize the benefits , as well as formulate a desire for re-routing resources. Hence, since the weaker party at the end of the bargain (the Guide) is the one who is aware of when the opportunity to switch places presents itself, it's left up to the player to determine when to suggest a route that will lead to a Portal and a switch. Likewise, it is up to the other player to evaluate the proposition and understand whether the guidance is birthed out of a justified feeling of fairness or pure greed. A sense of trust must be built between the two players in order for the game to be completed; the Muscle player must trust that the other partner will provide guidance away from danger and the Guide must trust that the other partner will follow directions. Players are left to decide during gameplay if they shall work together to reap equal rewards or if they want to go out for themselves, endangering a spurious cooperation that might lead to both

players' downfall. A sense of trust must be built between the two players in order for the game to be completed.

4. Setting and Participants

Three small scale experiments will be conducted until M15 (in addition to the three that have already been performed in M6 during the preliminary evaluation phase). Each experiment has different objectives aiming to evaluate different modules or functionalities of the platform. The experiments will be conducted in elementary schools in Greece with children of age 7-10. More specifically:

Location: Greece (Athens, Thessaloniki)

Number of children: 10-20 per experiment

Duration of each game session: 5'.

Duration of involvement for each player: ~ 20'

Overall duration of the exeriment: 1-2 hours

Researchers present: At least 3.

Technical setup: 2 laptops, 1 kinect sensor, 1 leap motion sensor

Dedicated project hardware or hardware requirements: At least one laptop with Windows 8 or 10.

5. Experimental Procedure

Players will be informed before the beginning of the experiment that they will play a game with their peers. They will be informed the game will be anonymous so that they won't know who they are being paired with.

A procedure for creating groups of players will then be followed. For example, players may be devided into two groups, by drawing tickets from a hat, containing two different color tickets. Based on the color drawn, groups will be formed. Each group will move to their respective room and they will be asked to write their name on their ticket and put it back in the hat: a second draw will determine the order that they will play. The specific procedure. will be adjusted to the pragmatic constraints of each setting

A short demonstration and explanation of the game will be provided by the researchers, who will also inform the players that they can withdraw at any time. The researchers will also check that the children are comfortable during gameplay. If a child becomes stressed or tired the game will be stopped.

Data will be recorded through the devices used during gameplay (see the Data Collection section below).

At the end of the session, all the children will be gathered together be debriefed. They will fill out a simple informal questionnaire about how they perceived and how they rate the game. The researcher will also answer any questions the children might ask.

5. Data Collection

Data will be collected using both traditional (questionnaires) and software-based (game logs) approaches.

Data will be collected automatically, through the devices used for playing the games.

Specifically:

- In-game information: player actions and events; time needed to collect a specific number of diamonds; player score (please consult the game log and description shared by CERTH)
- Video-capturing of the face of players through a webcam to detect facial expressions while playing the game.
- Capturing hand gestures (IR + skeletal data) through a Leap Motion Sensor
- Capturing body motions (rgb + depth + skeletal data) through Kinect.

In addition, student responses during the debriefing session, will be recorded in hand written questionnaires.

6. Data Analysis

For the technical evaluation of the platform's modules, the analysis of the data will be based on the assessment categories and indices defined in deliverable D2.5 "Evaluation Strategy and Protocols". Similarly, for the evaluation of the platform's usability/acceptability, a set of quality experience metrics defined in D2.5 will be used. CERTH, ATOS and EA will be responsible for the analysis of the collected data.

7. Ethical and Personal Data Protection Provisions

The following provisions will be taken to protect participant well-being and personal data:

- The players will play the games anonymously with system provided IDs.
- Data to be captured such as body motions, hand motions, reaction times and choices within the game will be tied to anonymous IDs and thus remain anonymous.
- Data that can be used to identify participants, namely video recordings during gameplay will be kept securely by CERTH, will not be made public for any reason and will be made available only to researchers from the consortium for data analysis purposes.
- Responsible adults will be asked ahead of time to provide appropriate consent in accordance to the project ethical guidelines after they are briefed about the contents of the games and about the data to be collected.

Experimental Protocol for Study 4 (Expressive Virtual Characters)

1. Purpose of the Evaluation

The purpose of the evaluations is to probe human impressions related to the behaviours and appearance of virtual characters. Person perception, which refers to how we form impressions about people, may also be applied when we interact with artificial humanoid forms, such as virtual characters, which may express themselves through facial expression, gaze and body motions.

User studies give us a better idea about how the expressions of virtual characters may be viewed and lead to impression formation, particularly in relation to emotion recognition and towards impressions of a prosocial character (for example, the use of eye gaze to convey social engagement, cooperation and trustworthiness).

2. Study Responsibility

KTH will conduct the study in collaboration with RK and EA

KTH will be the data processor and the data controller for this study

3. Description of the Game/Task

Participants will be shown a number of static images and/or short videos featuring virtual characters.

4. Setting and Participants

The experiment will be conducted in elementary schools in different European countries. A minimum of 30 students ages 7-10 will take part in this study. One researcher will be present. The overall duration of the experiment in each site will be approximately 1 hour. The time needed for the completion of the task by each participant is approximately 15-20 minutes.

Hardware required will be a computer system and web browser. The computer should be capable of playing basic video file formats e.g. avi, mpeg. Audio will not be necessary for the study. A somewhat quiet environment would be ideal, but is not necessary.

The experiment will be conducted in a classroom or computer lab setting of participating schools.

5. Experimental Procedure

Participating students will be briefed as a group about the activity they are going to do, The task will be presented as an voluntary empathy game of recognizing the emotions and intentions of others based on their facial expressions.

Participants will complete the experimental task individually, but many participants can work simultaneously on individual computers. . They will be seated at a computer screen and shown a number of static images and/or short videos featuring virtual characters. After viewing each image/video, they will be asked to rate their impressions of the characters (in terms of their emotions and prosocial characteristics, such as trustworthiness, likability and cooperativeness) either by clicking on the screen or by filling out a paper questionnaire.

When all participants complete the experiment, they will be thanked and debriefed, using open questions with the group as a whole, to allow them to articulate their experience from this exercise about how facial expressions may lead to impression formation, particularly in relation to emotion

recognition and prosocial characteristics. The researcher will answer any questions that they may have.

6. Data Collection

Data will be collected through the use of questionnaires. Participants will be asked to rate the emotions and prosocial characteristics, such as trustworthiness, likability and cooperativeness, typically through 5- and/or 7-point Likert scales. In addition to their answers, the only recorded data is an id number, age and gender.

7. Data Analysis

The data will be used to inform the design and control of expressive virtual characters capable of communicating intended emotions and prosocial characteristics to humans. Typically, this involves ensuring that an expression hypothesized to convey a specific emotion or characteristic successfully does so across a cohort.

8. Ethical and Personal Data Protection Provisions

Participants and responsible adults will receive a series of information sheets prior to the study, briefing them, obtaining their consent and informing them of their trial rights.

It will be made clear to participants both in the information sheets and orally on the day of the trial that participation is completely voluntary and if they change their mind about taking part in the study they can withdraw at any point during the session.

The data collection in this study is completely anonymous. The participants will respond anonymously with provided IDs. The only information recorded in addition to the answers of the participants is their age and gender.

The data will be treated as confidential. Only researchers at KTH and within the ProsocialLearn consortium will have access to the raw data. All the consent forms will be stored in a separate, secure (locked) location from the raw data itself. Computer files of data will be password protected. The raw data will be retained until final data analyses are completed. They will then be destroyed.

Experimental Protocol for Study 5 using the Kitty King's Candy Quest game

1. Purpose of the Evaluation

The goal of this study is twofold.

First, we aim to provide data for validating the central tenet of the ProsocialLearn concept. Namely to ascertain to what extent it may be possible to identify or measure prosocial intent or prosocial response through sensor data such as the webcam and microphones. For this purpose this mini-game was created that provides specific specific moments for pairs of participants to make decisions of *Generosity* and *Fairness,* elicit prosocial behaviours and record the participants responses by combining the sensor data with game data.

Second, we want to acquire a corpus of audio recordings that can be used to train an algorithm for emotion classification through voice, by comparing the outcomes of emotion classification between two different acquisition channels (i.e. voice and facial expression). As stated in D2.1 emotions play a relevant role in understanding the prosociality of persons, though no formal and operational model are available for children to show the correlation. Being able to correctly classify emotions is therefore fundamental for the project. Many existing studies try to classify emotions through different channels and modality[6,7] and some are specifically referred to children[8]. An ad hoc validation of our proposed mechanism, together with a comparison across different input modality is necessary as base for the understanding of emotion influence on prosocial behaviour. The

2. Study Responsibility

ITINNOV will conduct the study in collaboration with ATOS, PG and EA

ITINNOV, CERTH and UCAM will be Data Processors

ATOS will be Data Controller.

3. Description of the Game/Task

Kitty King's Candy Quest is a web-based game designed to be played by two players, focused on decision points that deal with prosocial concepts of Fairness and Generosity.

Players initially complete a short round of collecting candy by clicking on a candy jar. One player is assigned the role of the giver: this player gets all of the candy collected and has to decide how much to share with the other player, the receiver. The receiver then decides if the sharing was done fairly. Then the players are asked by the Kitty King to share how they feel about the game, by speaking to the camera.

There are two variations of the game, contained within the same set: one where the players collect candy individually and one where they play in collaboration with the other player. In each round of the game, each player is matched anonymously with a different co-player.

---

[6] Florian Lingenfelser, Johannes Wagner, Elisabeth André, Gary McKeown, and Will Curran. 2014. An Event Driven Fusion Approach for Enjoyment Recognition in Real-time. In *Proceedings of the ACM International Conference on Multimedia* (MM '14). ACM, New York, NY, USA, 377-386.

[7] Zixing Zhang; Coutinho, E.; Jun Deng; Schuller, B., "Cooperative Learning and its Application to Emotion Recognition from Speech," in *Audio, Speech, and Language Processing, IEEE/ACM Transactions on* , vol.23, no.1, pp.115-126, Jan. 2015

[8] S. Steidl, Automatic Classification of Emotion-Related User States in Spontaneous Children's Speech, Logos Verlag, Berlin, 2009

The game is not intended to teach prosociality, rather it is an experimental instrument designed to provide measurable moments where participants may exercise prosocial behaviour. By combining the video and audio data with game data which elicit specific prosocial decision points and records the participants responses, it is hoped to establish a scientific basis for the project where there is currently little to no existing literature.

4. Setting and Participants

The game will be played by a minimum of 30 pairs of participants from the intended project audience (7 to 10 year olds). Participants will be drawn from schools in three different European coutries to provide an appropriate dataset for the analysis

The game can be played on any two computers connected to the internet, using a standard web-browser (Chrome or Firefox recommended). Prior to the start of the experiment, each participant is assigned an identification number used within the operation of the game. These IDs must be entirely unique to any other execution of the experiment, and are not required to be shared with the actual participant.

Each play session will involve two players and last 20 minutes. It will include an individual briefing on the setup (5 minutes), playing the game (1-2 minutes), recording a response to the game (1-2 minutes), filling out a short questionnaire (10 minutes). Approximately 6 groups (12 players) will play simultaneously to ensure anonymity.

Voice acquisition in high quality is important for this study. The voice quality, will be set to the highest possible that can be supported by the given network connection. Background noise needs to be minimized as much as possible. The most practicable solution in a school setting is the use of a headset with high quality microphones. If possible, the game should be played in a separate room rather than a classroom setting. Some shore of noise filter may also be implemented.

A researcher will be present to facilitate the process.

5. Experimental Procedure

Players will be briefed about the game as a group, and a brief demonstration of the game and the set up will be given. It will be emphasized that the game is played anonymously, as this is very important to the premise of the game. It will also be emphasized that two players need to be connected to the same instance of the game before they can begin.

The step-by-step procedure for the experiment is largely handled by the game, with the exception of the initial briefing, and setup. The matching of participants is handled automatically by the platform. Given the dyadic nature of the game, even number of participants are required. Additionally to ensure anonymity as is the requirement of the psychological premise, having at least 6 players per session is recommended. Subjects may not confer, and should be discouraged from communicating with their peers whilst the experiment is running.

Once all participants complete the experiment (some may get through it faster than others), they will be thanked and debriefed. The facilitator will use open questions with the group as a whole, to allow them to articulate their feelings when faced with decisions of fairness or generosity, or when being on the receiving end of either.

6. Data Collection

Two sets of data will be automatically collected, while participants play the game:

- In-game data of specific player actions and start and end times, along with unique-yet-anonymous identifiers for game, round and player they correspond to. The data is collected at mid-level actions of the player, such as "player 1 shared x sweets, starting at y time and ending at z time", rather than a low-level capture, such as simple clicks. The actions recorded include : waiting time, amount of activity during collect phase, relative amounts offered by one player to another in the sharing phase and the other players response in accepting or refusing the offer.
- Video and audio record of each player's response at the end of each game round, about how they felt about their own or the other player's actions.

In addition, students will fill out a short open-ended questionnaire, adjusted in language and presentation to the particular age group.

7. Data Analysis

The data collected will be analyzed to establish a rudimentary baseline for fairness and generosity within the particular cohort (7-10 year olds). What percentage, on average, children in each age group give to their partner? How much is 'fair' for each age group? This will help us design the games mechanics to predict prosocial state and to determine aims to increase prosociality.

Further, the voice dataset we will obtain will help evaluate algorithms for emotion recognition in voice. The data collected will be used to extract voice features, which will then be classified in terms of emotions and validated by comparison to a classification based on a different modality (facial expression captured through video). The decomposition of voice characteristics will be performed off line when analyzing the data. The voice feature set will be varied to understand their influence.

Specifically, the analysis will examine the following assumptions:

- That the classification of emotions using voice features in kids of 7-10 years old is correct (within a threshold of consistency with already validated classifier based on facial expression recognition). In the comparison of emotion extracted from audio and video, the consistency between the outcomes of the voice classifier and the outcome of facial expression classification should be within 10% of the error rate.
- That the classification of emotions using voice is language independent for languages similar in nature (e.g. European languages): Comparison of precision and recall of the classifiers across different languages (at least 3) will be used to prove the language independency. The difference in f1-score of the classifier across at least three different languages should be less than 10% in 95% of considered population.

Finally , from facial expression emotion analysis and voice tone emotion analysis, we will be able to link emotions to prosocial state. For instance, a child who gave 30% of their sweets and showing positive emotions will be in a different prosocial state than a child who gave the same amount but demonstrates some negative emotions.

8. Ethical and Personal Data Protection Provisions

The following provisions will be taken to protect participant well-being and personal data:
- The players will play the games anonymously with system provided IDs.
- In-game data to be captured will be tied to anonymous IDs and thus remain anonymous It will be stored on a secure database as provided by ATOS for post-experiment analysis.

- Data that can be used to identify participants, namely audio and video recordings during gameplay will be stored securely by ATOS, in accordance with the project Ethical guidelines. They will not be made public for any reason. They will be made available only to researchers within the consortium for data analysis purposes.
- Responsible adults will be asked ahead of time to provide appropriate consent in accordance to the project ethical guidelines after they are briefed about the contents of the games and about the data to be collected.

Experimental Protocol for Study 6, using the Cooperative game

1. Purpose of the Evaluation

Understanding the influence of communication across players on prosocial activities is the final goal of this study. The project want zto use additional information extracted from voice (i.e. emotions) as part of the prosocial state assessment. It is therefore crucial understanding if a correlation exist between voice interaction and prosocial behaviour.

The study investigates the following assumptions:

Assumptions#1: The emotions as self-reported by each student through the feedback mechanism (i.e. the mood button) are consistent with the emotions detected by the classifiers (that uses sensors for data acquisition) if the two moments are within the same time window.

- **Verification process:** Comparison of outcomes from two different classifiers each one associated with a different acquisition channel (i.e. voice and feedback).
- **Verification statement**: The consistency of emotion classification (at a given time for a given user) resulting from the analysis of different channels (voice, feedback) is within 10% of the ground truth label data (i.e. the classifications from the different classifiers can differ at most in 20% of cases).

Assumption#2: Collaborative behaviour is influenced by voice interaction.

- **Verification Process**: Multiple run of the game performed by the same group of students (with and without the use of voice).
- **Verification statement**: The % of time (time expressed as number of sample rate) where the player position is assessed in the "desirable" region vs the % of total time is different in the two cases (different is defined as 10% of time).

2. Study Responsibility

ITINNOV will conduct the study and will be Data Processor

ATOS will be Data Controller.

3. Description of the Game/Task

The game is based on cooperative mechanisms grounded on the theory of public goods game that considers costs/benefits of decisions associated with collective or individual action. The game aims to explore the definition of a "Cooperation" prosocial domain including how to measure cooperation and observe emotional affect.

The goal of the game is for players to transfer the maximum amount of resource to an end point of a path where the resources are converted to private and collective benefits. Each player starts with resources and it is fixed that half of that resources will contribute to the personal good that will be translated in personal benefit at the end of the game and the other half will contribute to the collective goods that will be converted into the global benefit. Players must work together to avoid threats that reduce goods (both public and private).

The game has four players. It is a turn based game with two dices rolled each turn. The result of the dice may move each player, may move a threat or both of them. On each turn, one player is in charge of deciding how to use the results of the dice. The decision may lead to three classes of

movement: an individual movement, a collective movement (maximising the collective benefit, for instance helping someone else), and a neutral movement. Each move taken by a player in the game is classified and used to calculate a quantitative measurement of the cooperation at the end of the game simply analysing the classes of movement they have chosen (e.g. individual, collective, neutral). Each cooperative movement has a cost for a player. While the concept of cost is immediately clear to players, gaining an understanding that through cooperation the final benefit usually overcomes the cost will be part of the learning process. For instance the resource spent for performing a cooperative move may well be balanced by the fact that the move saves more resources belonging to another player, so globally preserving more Collective Goods.

The game can be played in two different modalities: with or without voice activated. Voice channel is designed as an independent channel that may stay always open or may be open/closed as necessary. Interaction through this channel is a way for sharing opinions across the players on the best strategy to follow. The voice will be used as a source of emotion observation.

A game feature called mood feedback collector allows the students to provide feedback on their mood choosing from a finite set of options.

A critical factor in the use of voice in a cooperation setting is the relative influence of group members. Without voice it is possible for individual decisions to be isolated, with voice some measure of influence would need to be measured to determine how much of the collective decision was related to a given player.

Therefore the first run of the game will be performed in the version without the voice. Each decision will be taken by the player in charge without any consultancy with the other players. It can still be a cooperative action, but will derive from the thought of a single player. The second run will be with the voice activated. Each player will have the possibility of express himself without other players talking concurrently. In particular the moment in the games when he will talk is after the dices roll, when he will provide his view on the best movement for the group. The player in charge will roll the dices (virtually), then each one of the other players will talk one at a time and then the player in charge will say what and why is his final decision. If necessary, some controls (e.g. time window restriction) may be used to reduce the influence of strong group members and to allow for quieter or shyer player to express themselves without being interrupted. The mood feedback button will be still available, and the data collected will be analysed, but currently the study does not make any assumption on the correlation between decision taken and moods (i.e. the decision may or may not be consistent with what suggested by the player and this may have an impact on his emotion).

For supporting experimentation and in particular removing the unpredictability of dice rolls results, it is possible to play the game with free dice rolls (i.e. each dice roll is unpredictable), or with fixed dice rolls (i.e. the sequences of dice rolls results along the game can be a-priory defined). This option is particularly welcome if/when multiple game runs with different configurations are used to perform tests. In this case it is possible to avoid the influence of random results, simply replicating them. Players, so they should remain uninformed of this specific aspect of the game.

4. Setting and Participants

The study may be performed across different sessions and it will include globally at least 30 game runs (15 groups playing each one 2 times a game, for a total of 60 students).

The game is browser based and the technical requirement is that the school must have a broadband connection. Pre-configured laptops may be used as clients to simplify the deployment phase: 4 client

devices per game are necessary plus one additional device for voice collection and feature extraction. Client devices should include headset for increasing sound quality.

Four different rooms should host the four players. If the logistic does not support this option, players should be made unable to communicate one with each other (e.g. using separating panels). According to the available hardware two or more groups may play simultaneously if the noise is negligible.

Researchers will be present to facilitate the study execution.

5. Experimental Procedure

From a research viewpoint, the experimental process is broken down into:
- Subject group selection
- Voice acquisition process (used by the voice classifier)
- Voice interaction

For each sub process a detailed set of variables is identified.

Subject Group Selection

Controlled Variable	Relevance	Possible Control Strategy
Subject Age	SET THIS TO A KNOWN VALUE	We assume there is no significant difference in the range 7-10 years old

Voice Acquisition

Controlled Variable	Relevance	Possible Control Strategy
Input voice quality	SET THIS TO AN EXPECTED CONDITION Low quality voice (e.g. SD vs HD) reduces quality of low level feature set.	Set the voice quality to the highest possible that could be supported by a specified network connection. Specify the microphone configuration
Background noise	MINIMISE OR SET THIS TO AN EXPECTED CONDITION Increases signal/noise ratio	Measure the S/N ratio if possible so we know the influence Have each player in a separate room rather than a classroom setting. Issue is this is not representative of how the game will actually be used. Use a headset with high quality microphones Implement some sort of noise filter?

Voice Interaction

Controlled Variable	Relevance	Possible Control Strategy
Voice Channel	VARY THIS TO UNDERSTAND INFLUENCE (Open/Close)	Perform the game with the same group under the two condition of voice interaction enabled/disabled

Game Evolution

Controlled Variable	Relevance	Possible Control Strategy
Dice Rolls Sequence	SET THIS TO A KNOWN VALUE	Game support predefined sequences of dice rolls.

From an operational viewpoint, participants will experience the following procedure:

- A briefing session of around 10 minutes will explain the game narratives and the final goal of the game. Examples of key situations in the game may be used to be sure the students hold the game logic enough.
- A game run lasts around 15 minutes and each group of four players should play two game runs in a row. The first game will be played without voice and second with it. The two games will present the same dice rolls sequences (this option needs to be activated).
- A debriefing session of 5 minutes may include generic feedback about the comprehension of the game logic (or anything appropriate according to the teachers).

A 1h session may therefore easily accommodate 2 game runs (not considering the concurrent execution option) including briefing and debriefing. This estimation needs to be validated by the teacher according to the specific school context.

6. Data Collection

Data will be collected through the game (becoming game log) and through voice recording from the voice analysis system.

The game logs are anonymized, that is they are linked numeric identifier with no evidence of the user real identity.

On the voice recording from voice analysis system, feature extraction will happen on the client side and only features will be communicated to the server and stored for the analysis. Local data will be deleted at the end of the session.

7. Data Analysis

The data collected will be used for:

- comparison of outcomes from two different classifiers each one associated with a different acquisition channel (i.e. voice and feedback)
- comparison of players' behavior when context changes (with or without voice interaction).

8. Ethical and Personal Data Protection Provisions

The following provisions will be taken to protect participant well-being and personal data:
- The players will play the games anonymously with system provided IDs.
- Data to be captured in the form of game logs will be tied to anonymous IDs and thus remain anonymous.
- Data that can be used to identify participants, namely audio recordings will be processed on the client side and only features will be communicated to the server and stored for the analysis. Local data will be deleted at the end of the session.

- ATOS will be responsible for the secure storage of the data, in accordance with the project ethical guidelines. Data will be available to researchers from ITINNOV and the ProsocialLearn consortium for analysis purposes.
- Responsible adults will be asked ahead of time to provide appropriate consent in accordance to the project ethical guidelines after they are briefed about the contents of the game and about the data to be collected.

Appendix 6 – Ethical Practices Protocol for Designing and Conducting ProsocialLearn experiments and evaluation studies

In the following sections, we outline the basic ethical principles which need to be considered in the planning and execution of the trials in ProsocialLearn. All trials should receive ethical approval from the relevant authority as well as be recorded with the ProsocialLearn EMB, who may recommend modifications to the trial protocol. This may lead to re-submission to any external ethics committee.

This document provides an overview and general guidance for the ProsocialLearn trials. It should be read together with **D7.1: ProsocialLearn ethical oversight procedures**. Any concerns or questions should be raised with the EMB.

A. Ethical Research Protocol

Introduction

The *Introduction* or trial overview should be introduced in terms of what the target outcome(s) might be, who is to be involved, where the trial(s) will take place, what data will be collected, and why.

Participants

There should be a description of:
- *Who will be involved* – what are the characteristics of the participants in the study? For example, age group, socio-economic background, gender, educational level. It is common practice to provide this information, not least for possible replication.
- *How they will be recruited* – if this is through a 3rd party, a copy of any authorisation should be provided; it is important that participants should be free to decide themselves (or rather their parents/guardians) whether or not to participate rather than feel under some level of constraint or pressure as a result of the school itself.
- *Criteria for inclusion* – if there are any, they should be justified.
- *Criteria for exclusion* (if any) – as above.
- *Any incentives offered for participation* – this should be equal across all participants and at an appropriate level. Note that participants should be able to keep such incentives even if they decide to withdraw.

Procedure

There should be a description of what the participant will be expected to do, for how long, and how often. This should include the general environment (i.e., "at a terminal in your classroom", "on your own PC at home", etc.), and any expectations on the participants (e.g., "you will need a pen and paper"… or whatever).

Data

Irrespective of the data to be collected, these should be handled appropriately (cf. D7.1, § 3.3, and Appendix 1: Privacy Impact Assessment). This may include anonymization or pseudonymisation, and if so, the process to be used should be described.

It should be clear who the Data Controller and who the Data Processors are, with appropriate agreement between them for data handling. The Data Controller will always have ultimate (legal) responsibility for data.

Description

There should be a detailed description of what data will be collected and why. There are different types of data which may be included:

- *General data*, including responses to surveys and questionnaires;
- *Personal data*, which is any data which would allow an individual to be identified;
- *Sensitive data* – a special category related to personal data, which relates to specific topics (such as ethnic origin, health, religion, sex life, criminal record, etc.).

Both personal and sensitive data require special management; participants (or their parents/guardians) have the right to access, review, correct and/or withdraw data at any time.

Collection

Describe how the data will be collected (online survey, questionnaire, video recording[9], etc.). If this involves any intrusive equipment (anything which touches the participant) this should be explained, and a risk assessment provided.

Storage

Describe how and *where* data will be stored. Although data exchange between EU Member States is usually acceptable (though the local DPA will ultimately decide in connection with personal or sensitive data), participants will have an expectation that their data will be stored in accordance with local laws / regulations. Any deviation from this should be made known.

Note that data transfer with countries outside the EU will need special treatment.

Processing

Describe how and *why* the data will be processed. See above on processing outside the country where the data were collected.

Post study

It is a courtesy to provide some feedback on outcomes / results. This does not need to be very detailed. However, minors will clearly have an expectation that there are tangible results from what they've done.

Debrief

There should be **no deception** involved in the trails (cf. D7.1, § 3.2.5).

If for any reason, there is a legitimate reason not to inform participants and relevant parties (the school, the parents/guardian) of the nature of the study, this should be reviewed before it is undertaken by the EMB.

Data retention

---

[9] NB. Photos, videos, audio recordings of participants constitute personal data by default.

Describe where data will be held and for how long.

Explain if there is any expectation or obligation to publish the data externally.

Explain if there is any expectation or obligation to allow derivative work based on the data collected.

B. Documentation to be provided

Consent

The major challenge is the involvement of minors, which dictates that Informed Consent must be sought from a third party, namely the parent or other legal guardian of the child. This is a legal requirement. However, there is an ethical requirement on top of that which means that steps should be taken to check individual participant willingness for continued involvement.

When dealing with minors (and vulnerable or dependent participants), there is a practical need:

- To request and obtain consent from an appropriate adult or guardian with legal competence;
- To maintain motivation: i.e., to recheck willingness to continue, usually with the participant themselves, but usually in discussion with the appropriate adult or guardian.

This may advantageously involve the use of other media: for instance, creating a video of a demo of a game and people playing the game, posted on the project website. The consent form itself should be simple and straightforward, including pictures or graphics helps; and formal legal language can be off-putting.

An example form is shown below, based on examples provided by Sarah Parsons from University of Southampton.

Participant Information

This should summarise the information above, so that a potential participant gets a clear idea of what is involved and what agreeing to participate would mean.

An example is shown below.

Consent form for Children

Project: We are looking at games where you get to work with other players (called *ProsocialLearn*)

Ethics: [REF]

Researcher Name: [NAME]

Date: [DATE]

Please put your initials in each box if you understand. Ask any questions about the study you like.

- I know that I don't have to take part and that I can stop being involved at any time I like

- I know that no one will know I've taken part in the study. This is call *anonymization*: all references to me get hidden.

- I agree to take part in the project and I agree that others will be able to see my answers

- I have seen the information about the project [REF]. I am happy to get involved, and I know I can ask questions at any time if I don't understand something

- It's been explained to me that my answers are protected by special rules, called Data Protection.

This is my signature: ………………………………

This is my name: ………………………………   **Date:** [DATE]

Researcher's signature: ………………………………

Consent form for Parents or Guardians

Project: We are looking at games where children get to work with other players (called *ProsocialLearn*)

Ethics: [REF]

Researcher Name: [NAME]

Date: [DATE]

Please put your initials in each box if you understand. Ask any questions about the study you like.

- I have read and I understand the Participant Information Sheet [REF] and have had a chance to ask any questions about the study.

- I agree that the child in my care and named below can take part in this research project and I agree that their data can be recorded and used for the purpose of this study only.

- I understand that the responses from the child in my care will be anonymised in research reports to prevent identification.

- I understand that the child in my care may withdraw at any time and without affecting their legal rights.

I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of this study.

Parent's Name: ………………………… **Child's name:** …………………………

Parent's Signature: ………………………… **Date:** [DATE]

Researcher's signature: …………………………

Participant Information for Children

Looking at games where children get to work with other players (called *ProsocialLearn*)

What's this project about?

There's lots of work done about people doing things in teams so they get better results. And there's been a lot too about games and using games for teaching and things like that. But what we don't know is whether typical games might make you want to work together with other people.

Why are we asking you?

We're asking you to take part because with think that you can show us how players work together or not in typical games.

What will happen? When?

We'll give you a game that we've devised and ask you to play it with some of your classmates while we watch and take notes on what's happening. It's a fairly normal game with levels and collecting money and that sort of thing. The game should last about [X] minutes. Depending on what you do to win, we're going to record what happens so we know the effects that

[REF][VERSION][DATE]
games like these have on how you work together or not.

What will you have to do?

It's just a normal game, that's all. You can see what the game looks like if you go to the website [URL] where you can see a video of it. All you have to do is play the game like you would play any other game. Some of your class mates will be different players in the game with you.

You can play as much as you like. And you can stop whenever you like.

Who will be involved?

[ABC] from [partner name] is going to be running the project.

Phone: 123 456 7890

eMail: [ABC]@[partner name]

Are you a bit confused?

If you've still got any questions, you can always ask [ABC] or just talk to your teacher.

Participant Information for Parents / Guardians

Looking at games where children get to work with other players (called *ProsocialLearn*)

[REF][VERSION][DATE]

What's this project about?

We know a lot about how adults co-operate and help each other. In research this is known as *prosociality*. One important reason behind sending our children to school is to become experienced in socialising with others. It would be nice though, too, if we could encourage them to go that next step, and learn to co-operate with each other. This would be good for them and society as a whole. Our project is looking at using games to teach children at school about the benefits of co-operating.

Why have we chosen the child you care for?

We're asking children like yours to take part who are the right age and at the right stage in their schooling.

What will happen? When?

We'll give the child you take care of and their classmates a game that we've devised and ask them to play it with some of their classmates while we watch and take notes on what's happening. It's a fairly normal game with levels and collecting money and that sort of thing. The game should last about [X] minutes. Depending on how the children work together to win, we'll be recording what happens so we know the effects that games like these have on how the children work together or not.

What will the child you care for have to do?

It's just a normal game, that's all. You can see what the game looks like if you go to the website [URL] where you can see a video of it. All the children will have to do is play the game like any other game. Different children in the class will be different players in the game along with the child you care for.

They will be able to play as much as they like, within reason and so long as it doesn't disrupt the class teacher's plans. But they can also stop whenever they want, even altogether.

Who will be involved?

[ABC] from [partner name] is going to be running this part of the project.

Phone: 123 456 7890

eMail: [ABC]@[partner name]

Any questions?

If you've still got any questions, you can always ask [ABC] or just talk to the class teacher.

As well, if at any time, you have any complaints or concerns about what's going on, you can contact [XYZ] who will provide you with any answers and handle any complaints you have as quickly as possible.

If you're happy to go ahead?

If you are happy for the child you care for to take part, please sign the attached consent form. The child you care for will also be told what the project is about and be given a consent for of their own. You can see the information they've been given and a copy of the consent form attached. We will make every effort to make sure the child you care for knows what's going on and does feel under stress or pressurised.