



Managing Affective-learning THrough Intelligent atoms and Smart Interactions

D2.1 Formation of stakeholder groups

Workpackage	WP2 - User, System Requirements and Learning Goals
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Abstract:	<p>This deliverable maps the formation of the MaTHiSiS Stakeholder groups to the five Use Cases formed in the project. These Use Cases include both neuro-typical learners and those with a range of cognitive, physical and sensory impairments.</p> <p>Working methods are suggested to elicit user requirements, learning goals and smart learning atoms, and human computer interaction considerations to ensure affect information can be gathered in a non-intrusive way.</p> <p>These methods include the use of personae designed within this project to derive early user requirements; interviews and thematic analyses to derive learning goals and smart learning atoms; user sensitive inclusive design to elicit formal user requirements; focus groups with storyboards and other design artefacts to derive user requirements and learning goals in consultation with learners across the five Use Cases including those with cognitive disabilities; and early trials with platform agents and existing algorithms to assess the challenges in collecting affect information and the human computer interaction considerations associated with this task. Consulting learners in the formation of a framework for user acceptance is also discussed.</p>
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List of Acronyms

Abbreviation / acronym	Description
SLA	Smart Learning Atom
PMLDC	Profound and Multiple Learning Disabilities Case
ASC	Autistic Spectrum Case
CGDLC	Career Guidance Distance Learning Case
MEC	Mainstream Education Case
ITC	Industrial Training Case
SEN	Special Education Needs
HCI	Human Computer Interaction
FMD	Fondazione Mondo Digitale
JYCL	Equipo de Atención a Alumnos con Transtorno de Con-ducta. Consejería de Educación_Junta de Castilla y León
RIX	RIX Research and Media
NTU	Nottingham Trent University
UoN	University of Nottingham
ID	Intellectual Disability
IWB	Interactive White Board
PC	Personal Computer
VET	Vocational Education and Training
LCDS	La Cometa del Sud
EOPPEP	EOPPEP is the National Organisation for the Certification of Qualifications and Vocational Guidance in Greece.

Table 1: Definitions, Acronyms and Abbreviations

Project Description

The MaTHiSiS learning vision is to provide a novel advanced digital ecosystem for vocational training, and special needs and mainstream education for both individuals with an intellectual disability (ID) and neuro-typical learners. This ecosystem consists of an integrated platform, along with a set of re-usable learning components with capabilities for: i) adaptive learning, ii) automatic feedback, iii) automatic assessment of learners' progress and behavioural state, iv) affective learning, and v) game-based learning.

In addition to a learning ecosystem capable of responding to a learner's affective state, the MaTHiSiS project will introduce a novel approach to structuring the learning goals for each learner. Learning graphs act as a novel educational structural tool. The building materials of these graphs are drawn from a set of Smart Learning Atoms (SLAs) and a set of specific learning goals which will constitute the vertices of these graphs, while relations between SLAs and learning goals constitute the graph's edges. SLAs are atomic and complete pieces of knowledge [1] which can be learned and assessed in a single, short-term iteration, targeting certain problems. More than one SLA, working together on the same graph, will enable individuals to reach their learning and training goals. Learning goals and SLAs will be scoped in collaboration with learners themselves, teachers and trainers in formal and non-formal education contexts (general education, vocational training, lifelong training and specific skills learning).

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Executive Summary

This deliverable maps the formation of the MaTHiSiS Stakeholder Groups to the five Use Cases formed in the project.

First, the rationale for the development of the five Use Cases is developed along with their selection criteria. In striving for Universal Access we follow other multi-disciplinary teams in efforts from merely 'knowing the user' to 'knowing the diversity of users' [2].

Second, we describe our stakeholder groups in the UK, Greece, Italy, Spain, France and Lithuania, and how they are aligned to each of these Use Cases. In overview our extant mapping is:

1. Profound and Multiple Learning Disabilities Case (PMLDC) – Nine organisations will collaborate in the MaTHiSiS project with learners, teachers and facilities in the UK, Italy and Spain.
2. Autistic Spectrum Case (ASC) – Ten organisations will collaborate in the MaTHiSiS project with learners, teachers and facilities in the UK, Italy and Spain.
3. Mainstream Case (MEC) – Seventeen organisations will collaborate in the MaTHiSiS project with learners, teachers and facilities in the UK, Italy, Spain and Lithuania.
4. Industrial Training Case (ITC) – Two organisations, with another currently in negotiation, will collaborate in the MaTHiSiS project with trainees, trainers and facilities in France and Spain.
5. Career Guidance Distance Learning Case (CGDLC) – Three organisations will collaborate in the MaTHiSiS project with trainees, trainers and facilities in Greece.

It is recognized that Use Cases are the standard practice for gathering user requirements [3], and the third section of this document discusses our next steps to gather such requirements with our stakeholders. Methods to elicit user requirements, learning goals and smart learning atoms, and human computer interaction considerations to ensure affect information can be gathered in a non-intrusive way are developed.

These methods include the use of novel Personae designed within this project to derive early user requirements; interviews with teachers and trainers and subsequent thematic analyses to derive learning goals and smart learning atoms; user sensitive inclusive design to elicit formal user requirements; focus groups with storyboards and generative toolkits to derive user requirements and learning goals in consultation with learners across the five Use Cases including those with cognitive disabilities; and early trials with platform agents and existing algorithms to assess the challenges in collecting affect information from extreme users and the human computer interaction considerations associated with this task. Consulting learners in the formation of a framework for user acceptance is also discussed.

These methods represent our next steps in working with our stakeholders within Task 2.1 (User Requirements and Learning Goals; M1-M9). The outcomes from this Task will feed into Task 2.2 (System Architecture) in two phases – starting in Month 4 (April 2016) working with Personae to identify early user requirements, and then again in Month 9 (September 2016) to ensure that the design of the MaTHiSiS software and hardware architecture is properly adapted to the use cases by considering all user requirements, learning goals, HCI considerations and a Framework for User Acceptance.

1. Introduction

Involvement of users and relevant stakeholders is central to the vision of the MaTHiSiS project, and its drive towards user-centred validation, where “users” range from school associations to industries with vocational training procedures. The key benefit of MaTHiSiS user-centred design is that stakeholders and policy makers can contribute at a sufficiently early stage, so that their input can be taken into consideration.

Establishing stakeholder groups for each of the five categories of use cases (Mainstream Education Case, Autism Spectrum Case, Profound and Multiple Learning Disabilities Case, Industrial Training Case and Career Guidance Distance Learning Case) ensures their input into two central tasks of Work Package 2 (tasks 2.1 and 2.2) to determine user requirements and learning goals, and to develop full descriptions of the MaTHiSiS software and hardware architecture that respond to the needs of our learners.

Involving stakeholders in this way is a challenging mission, and will contribute to the sustainability of our project. It will help us address organisational barriers for developing innovative and personalised pedagogies and assessment practices, support the development and availability of open educational resources, allow classrooms and training centres to be connected, and mobilise the end users to change the role of digital technologies in education institutions and vocational training facilities throughout Europe.

The engagement of stakeholders and users will continue throughout the MaTHiSiS lifecycle and beyond project completion. As a partnership we are committed to continuously track impact achievements, and to promote results to stakeholder communities including increasing public awareness through communication activities.

This document is divided into the following three sections:

1. Description of Use Cases and their selection criteria
2. An initial Definition of our stakeholders aligned to these Use Cases
3. Methods that we will use with these stakeholders to derive user requirements, learning goals and smart learning atoms, and to assess the challenges of collecting affect information with the existing MaTHiSiS software and hardware architecture, and associated HCI considerations.

This is a public facing document, and intended to be read by those involved in mainstream and special needs education, as well as vocational and industrial training. We are at the start of this exciting project and fully welcome others to join our community, be it as new stakeholders willing to be involved in the piloting activities of our project that will continue until summer 2018, or those interesting in hearing about progress and release dates for the MaTHiSiS ecosystem.

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2. Use Cases and Selection Criteria

In order to elicit user requirements from a diverse set of learners, define their learning goals, understand the challenges in collecting affect based information from them in a range of contexts, and to achieve technological readiness, a series of five Use Cases have been selected. These are shown in table 2, along with five criteria to justify their selection. These criteria concern the need to develop more engaging ways in which to teach vocational subjects, approaches to promote the active inclusion and full participation of disabled people in society, improving the quality of life for people with autism by developing new educational approaches, the need to facilitate more personalised learning for students with special needs, and the need to raise significantly the share of persons with disabilities working in the open labour market.

Taking into account the needs of the groups of users represented in these Use Cases also addresses the very real challenges of universal access, including for those with motor impairments, visual impairments, hearing impairments, cognitive and communication impairments, and children and older users [2]. The set of five Use Cases can be seen to represent a set of ‘extreme users’ and approaches to inclusive design have emphasised the role and value of these users in innovation and new product development [4]. Indeed prominent researchers in inclusive design make the assertion that in designing well for extreme, or ‘extra-ordinary’ needs, that we design inclusively for all [5].

MaTHiSiS Use Cases Selection Criteria	
Use Cases	1) Autism Spectrum Case (ASC) 2) Profound and Multiple Learning Disabilities Case (PMLDC) 3) Mainstream Education Case (MEC) 4) Industrial Training Case (ITC), and 5) Career Guidance Distance Learning Case (CGDLC)
Criterion C-1	Vocational Guidance Trends
European Facts	<p>The UK Government has recognised there is a decline in applications to University Computing courses which is impacting on the economy where there are an increasing number of employment opportunities as well as opportunities both in the UK and globally [6].</p> <p>The Education Minister has stated that this decline is due mainly to a poor Information Communication and Technology (ICT) curriculum in Schools which he describes as ‘boring’ [7]. Various reports, such as the NextGen Skills report [8], authored primarily by subject experts in the games and creative technology industry, argue explicitly for Computer Science to form part of the school curriculum. The ICT curriculum was therefore suspended in 2012, followed by a full review of the ICT curriculum. ‘The way forward for computing in UK schools’ [9] recommends a more rigorous curriculum enabling children to explore and experiment with coding and robotics. This has resulted in a new national Computing curriculum, as a new subject from 2014, from primary (ages 5-11 years) through to secondary education (11-14 years) as a core curriculum subject, with new qualifications at 16 years, and 18 years, introduced from September 2014. The MaTHiSiS project responds to these challenges via the inclusion of its MEC with coding challenges launched on a range of Platform agents. including robots</p> <p>At an Europe-wide level, the Bruges Communiqué [10] in its vision for future European Vocational Education and Training (VET) calls for the development of</p>

	attractive and inclusive systems, using innovative learning methods, supporting flexible learning pathways, and catering for both non-formal and informal learning. The selection of the GCDLC and ITC responds directly to these challenges, and the notions of 'inclusivity', 'flexibility' and the blending of formal and informal learning are central to the MaTHiSiS vision.
Criterion C-2	Societal Needs
European Facts	<p><i>'The EU promotes the active inclusion and full participation of disabled people in society, in line with the EU human rights approach to disability issues. Disability is a rights issue and not a matter of discretion'</i>¹.</p> <p>The European Commission's European Disability Strategy 2010-2020 objective in Education and Training is to promote inclusive education and lifelong learning for students and pupils with disabilities. <i>"Equal access to quality education and lifelong learning enable disabled people to participate fully in society and improve their quality of life"</i>². This is just one of such initiatives launched by the EU concerning the education of people with disabilities (for example see [11] for details on vocational education and training for special needs education.)</p> <p>The selection of the ACS and PMLD Cases respond to this challenge.</p>
Criterion C-3	Personalised Learning.
European Facts	<p>ET 2020 strategic objective 3 promoting equity, social cohesion and active citizenship [12] aims to facilitate more personalised learning for students with special needs <i>"Education and training systems should aim to ensure that all learners – including those from disadvantaged backgrounds, those with special needs and migrants – complete their education, including, where appropriate, through second-chance education and the provision of more personalised learning."</i></p> <p>Personalisation, collaboration and informal learning will be at the core of learning in the future. And to reach the goals of personalised, collaborative and informalised learning, holistic changes need to be made [13].</p> <p>The selection of the ASC PMLDC, MEC, ITC and CGDLC all respond to this challenge, where personalisation is central to the MaTHiSiS system architecture. The ASC and PMLDC ensure that learners with special needs will have access to personalised learning.</p>
Criterion C-4	Labour Market
European Facts	<p>The European Commission's European Disability Strategy 2010-2020 [14] aims to raise significantly the share of persons with disabilities working in the open labour market. They represent one-sixth of the EU's overall working-age population, but their employment rate is comparatively low. MaTHiSiS specifically addresses this objective by developing Use Cases for students with disabilities to develop their vocational skills (ASC, PMLDC). Between 76 and 90 per cent of adults with autism are unemployed, and reports have articulated the issues and difficulties faced by people with autism in relation to finding and keeping a job across Europe, and encourage the creation of new employment opportunities [15]. The United Nations Convention on the Rights of Persons with Disabilities [16] outlines various forms of</p>

¹ Available at <http://ec.europa.eu/social/main.jsp?catId=1137>

² Available at <http://ec.europa.eu/social/main.jsp?catId=1137>

	support that can be utilised to enable individuals with autism spectrum disorders to participate in employment, acting like a foundational guide to everyone interested in developing new labour market opportunities for people with autism, including their families, autism professionals, employers and policymakers. The specific inclusion of the ASC in MaTHiSiS aligns itself to the creation of new labour market opportunities for people with autism.
Criterion C-5	Social Integration of Autistic People
European Facts	Autism-Europe reports that improving the quality of life for people with autism is achieved through ‘promoting awareness of appropriate care, education and well-being for people with autism’ [15]. The Charter of Rights for Persons with Autism [17] calls for the right of people with autism to accessible and appropriate education. The specific inclusion of a use case for students with Autism in MaTHiSiS will help us to achieve the development of effective educational practices for this target audience.

Table 2: Use Case Selection Criteria

The following section more fully articulates these Use Cases by identifying target audiences, sketches of potential learning goals, illustrations of the reusability of learning atoms, and describing the ubiquitous and non-linear nature of the MaTHiSiS learning vision for each.

2.1 Use Case 1: Autism Spectrum Case (ASC)

2.1.1 Who we address: We have chosen three different cases, working with students aged 3-19 years old:

- (1) 'Low-functioning' autism without much communicative speech
- (2) 'High-functioning' autism or Asperger syndrome, and
- (3) People with autism spectrum conditions at all levels of functioning, with intense sensory perceptual sensitivities.

2.1.2 Goal and Example Scenarios: The very heterogeneity and cognitive variability within the autism spectrum, which so often have hampered the implementation of spectrum-wide educational strategies, are exactly what MaTHiSiS is designed for. In all these subcases, MaTHiSiS's flexibility of goal structure and content delivery is important in harnessing the prior interests and fascinations of autistic individuals so as to motivate learning by using these interests and fascinations. For instance, in the case of an autistic child with a strong interest in aeroplanes, the icons, graphical symbols and spoken words in motor communication therapy, the characters and events in narrative therapy, or the sounds and sights encountered in sensory therapy could be tailored around people, places and things found in airports.

2.1.3 Ubiquity setup: The hardware and other aspects of the mode of content delivery can be not only a function of individual learning styles but also a function of institutional, economic and geographic constraints. Work on autism therapy in India, for instance [18, 19] has made use of Android mobile devices simply because they are so ubiquitous: even in regions without reliable electricity or fixed-line telephone service, mobile phones have become common. And of course interactions between different individuals' learning goals and their verbal, visual, and motor learning styles will dictate different platforms for content delivery, for instance robots or virtual environments for teaching emotional and social skills, tablets for teaching graphical communication.

2.1.4 Non-linearity: Each content-delivery device, in the school or clinic and in the home, will 'know' the learner's current developmental and educational level, and will be able to adapt its content for this level, producing an integrated feel even across distinct modalities of content delivery. For example, vocal and motor interaction with a social communicative robot in the school could be reinforced and augmented via facial emotion recognition training delivered on a mobile phone or tablet in the home.

2.1.5 Re-usable content (Smart Learning Atoms): Every person with autism experiences different levels of autism's motor, social and sensory symptoms; thus therapies tailored to individuals will incorporate different weightings of SLAs at each of these levels. For a person with Asperger syndrome a motor-control atom and emotion-perception and social perspective-taking atoms could pertain in the context of physical education for team sports, where rapid perception of the physical properties of the ball and of the intentions of other players are essential for successful performance.

2.1.6 Labour Skills: An especial tragedy of autism is that although autistic people often have intact or even superior skills with which to perform a job, they haven't the social perspective-taking skills to succeed at interview or to retain the job in a context in which expectations might be socially hinted rather than stated explicitly, or they haven't the executive functioning skills to juggle and to prioritise many simultaneous tasks, or their sensory perceptual sensitivities make it impossible for them to work in a built space that has not been adapted for them to minimise sensory interference [20]. Most therapies for autism, from emotion recognition to social skills training to perceptual desensitisation, confront these issues precisely because they are so essential to an autistic person's ability to function within a world built by and for non-autistic people, and the greatest significance of these barriers to functioning arise in the context of employment. This is true at all levels of functioning, from the nonverbal special-education graduate who wants a job assembling factory components but has trouble moving her fingers individually and can't tolerate fluorescent lights or electric hand-dryers, to the university lecturer with Asperger Syndrome who despite his excellent research and publications cannot obtain tenure because he hasn't understood what his colleagues expect of him in social contexts.

2.2 Use Case 2: Profound and Multiple Learning Disabilities Case (PMLDC)

2.2.1 Who we address: 5 to 18 year olds with profound and multiple learning disabilities

2.2.2 Goal and Example Scenario(s): To improve verbal communication or to navigate an electric wheelchair independently. Many young people with profound and multiple disabilities have poor verbal communication. For those who can approximate a single word, caregivers are keen to assist them to build on this skill to achieve i) clearer enunciation of the word ii) increase their vocabulary iii) combine words meaningfully iv) learn to take turns to enable two-way communication with someone else.

2.2.3 Ubiquity setup: Learners with profound and multiple learning disabilities appreciate robots because they are predictable and have fewer channels of communication than a human thus reducing the chances that the learner becomes overloaded [21]. Tablets/mobile devices will display Makaton Symbols [22] (signs and symbols to help in communication) and using audio files will playback examples of correctly enunciated words; and the use of music the learner likes can act as a reward.

2.2.4 Non-linearity: Each learner's capability will be known to the robot or dashboard in the classroom but, also, to his/her mobile device at home; these devices may be instructed to perform different tasks but they will all know the skill levels of the learner.

2.2.5 Re-usable content (Smart Learning Atoms): A basic learning atom would be 'cause and effect' based (so they could associate an event that happened as a result of their utterance). Others include:

- Sustained attention (long enough to learn something).
- Clear enunciation.
- Increased vocabulary (depending on what words were useful for the individual learner).
- Combining words meaningfully.
- Making a meaningful request.
- Turn taking.

- 2.2.6 Labour Skills:** Due to the severity of these cases no labour skills are (as yet) envisaged to be learned through these pilots.

2.3 Use Case 3: Mainstream Education Case (MEC)

2.3.1 Who we address: The focus of this use case is on neuro-typical children in primary and secondary school education (5-14 years) with a wide range of abilities who are now experiencing the new national computing curriculum. This case will also include a mix of male and female learners to identify gender differences in attitudes and approaches to learning new concepts in computing.

2.3.2 Goal and Example Scenario: The Computing Curriculum in the UK is broken down into Key Stage 1 (5-7 years), Key Stage 2 (7-11 years), Key Stage 3 (11-14 years), and Key Stage 4 (14-16 years). From Key Stage 1 learners are taught a range of outcomes that could be tackled using the MaTHiSiS ecosystem including to [23]:

- *“understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions*
- *create and debug simple programs”.*

Therefore, at this early stage in learning there is opportunity for simple robotic interactions. The curriculum continues to develop, reflecting greater and deeper knowledge of programming language on a range of devices such as mobile technologies. By secondary school, learners re taught other outcomes that can be mapped to the MaTHiSiS ecosystem including to [24]:

- *“design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts*
- *use sequence, selection, and repetition in programs; work with variables and various forms of input and output*
- *use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.”*

Each of these elements of the curriculum will provide creative opportunities for learners to program a range of devices, including mobile phones and robots. The use of robotics will particularly provide a bottom-up approach to creating sequences, where the robot will enact the logical sequence, and enable interaction between learners and robots. Their use will show how physical systems can be controlled, illustrate the use of sequence, and show how logical reasoning can be used to explain how simple algorithms work.

- 2.3.3 Ubiquity setup:** Linking directly to the primary and secondary Computing Curriculum, an approach to teaching algorithms and logic can be developed, using robot-based visual programming interfaces (Choreograph [25] on the NAO robot platform). Behaviours can be pulled onto a stage and neuro-typical students can link them into logical sequences where the robot physically demonstrates these sequences, and allows the students to check in real time the accuracy of their logical sequence formation. Mobile devices can be used to teach all programming concepts, asset creation, and programming, and will enable learners to experience programming in a variety of locations both within, and beyond, school.
- 2.3.4 Non-linearity:** Each learner's capability will be known to the robot or dashboard in the classroom but, also, to his mobile device at home; these devices may be instructed to perform different tasks but they will all know the skill levels of the learner. This will enable learning beyond school.
- 2.3.5 Re-usable content (Smart Learning Atoms):** As the National Computing Curriculum is based on 4 Key Stages, there is an opportunity to re-use artefacts and assets throughout compulsory schooling, enabling a deeper level of learning and reflection on learning. For example, learners will learn to understand the hardware and software components that make up networked computer systems, how they interact, how they affect performance, and learn to understand how computers can monitor and control physical systems in a variety of curriculum areas thus developing their computational thinking skills.
- 2.3.6 Labour Skills:** There are clear links to both Higher Education and employment through enabling higher level computing skills, knowledge and understanding. This is supported by the UK Government, (for example see [7]), and various reports referred to above. There is an increasing employment market for computing, including gaming, both in the United Kingdom, throughout the EU, and globally. This will enable learners increased opportunity to develop key employment skills required for the future workforce for what has been a shrinking employee market, and enable expansion of these key industries aligned to computing.

2.4 Use Case 4: Industrial Training Case (ITC)

- 2.4.1 Who we address:** Large industrial sites, employing a wide variety of workers (different levels of education, experience, positions within the company, sectors of activity within the company - from technical to managerial, technical contexts, etc.)
- 2.4.2 Goal and Example Scenario(s):** To decrease the time for industrial training activities, and to help employees adapt to the constraints of demanding industrial environments. This includes potential challenges linked with working conditions, health and security standards, to adapt their working environment to smoothly integrate learning content, and to allow the smooth transition between the training environment and the 'real-life' environment. An example scenario concerns the requirement of industry to update its technology and the accompanying need to train its employees in the use of such new technologies. Another scenario concerns security rules that must be applied in factory settings to avoid accidents. In this case, there will be an ongoing need to repeat training exercises in the real industrial environment to ensure workers are aware of security rules they need to apply.
- 2.4.3 Ubiquity setup:** Using the MaTHiSiS platform along with mobile devices, a continuous training process for users will be established. Trainees will be supported at all times to reach their respective goals. This represents an improvement in terms of the time spent in industry in training its staff.
- 2.4.4 Non-linearity:** Each trainee will have their own personal profile, while non-linearity in training will be achieved by notifying trainees when relative information is nearby, either in physical place relative to their goal (through mobile location-based services), or virtually (e.g., when she/he is searching the Internet).
- 2.4.5 Re-usable content (Smart Learning Atoms):** This use case will convert the industrial training process, into a MaTHiSiS learning scenario. To do so, specific MaTHiSiS SLAs will be created based on the specific manual of learning that each industry pilot will provide.
- 2.4.6 Labour Skills:** This Use Case will provide new labour skills to industry-based employers, and will keep them up to date with technological advances.

2.5 Use Case 5: Career Guidance Distance Learning Case (CGDLC)

2.5.1 Who we address: Career Guidance Stakeholders (career guidance counsellors, public and private career guidance services, social partners, employers etc.) and the general public that can benefit from distance training in career guidance (students, parents, unemployed people, various people at transition phases etc.)

2.5.2 Goal and Example Scenario(s): The goal is to provide distance learning career guidance to as many people we can reach. Access to effective career guidance is very important. Our goals are: to promote innovative career guidance methods and educational materials, to develop career management skills, to create a framework for quality assurance in career guidance, to provide career guidance with the use of ICT, to use and interpret diverse career guidance educational materials, to promote and create new job search techniques, to elicit new trends and needs in the labour market, to build career management skills, to define and recognise non-formal and informal learning in career guidance, to boost self-awareness and self-confidence, to create novel frameworks for learning to learn and create new sources of career information. To do so, two example scenarios through the pilot phases are envisaged:

1) Distance Training of career guidance counsellors in the public and private sectors, adjusted to their personal needs and pace of learning, also contributing to their own continuous professional development, and

2) Distance career guidance services to the general public (students, parents, unemployed people, various people at transition phases etc.) in a personalised and non-linear learning way.

2.5.3 Ubiquity setup: The MaTHiSiS platform agents will provide a non-stop, everywhere learning process. The CGDLC will exploit this functionality by organising national level distance training courses.

2.5.4 Non-linearity: Non-linearity will be deployed in this Use Case by notifying the learner when something relative to their goals is nearby. This can be a physical place relative to their goals (through its mobile location service), or a virtual place (e.g., when she/he is searching the Internet).

2.5.5 Re-usable content (Smart Learning Atoms): Career guidance educational material will be converted into several SLAs (e.g., knowledge of the labour market).

2.5.6 Labour Skills: The following skills will be developed:

1) For Career Guidance Counsellors: counselling skills, ICT skills, organisational skills, skills for professional development, multicultural skills (skills to work with diversity and multicultural populations) and,

2) For the General public: career management skills, written and oral communication skills, and decision making skills.

3. Description of Stakeholders for each Use Case

3.1 Common Template to Describe Stakeholders

The following information was scoped for each stakeholder mapped to the five Use Cases. In some instances stakeholders are mapped to more than one Use Case. For example some of our school-based stakeholders have students who could fit into the ASC as well as the PMLDC. A common template is used to describe stakeholders with the following categories:

1. Organisation name
2. Contact details (address, emails, phone, including main contact person)
3. General description of the organisation (aims/goals, size, relevance to project and Use Case)
4. Description of the characteristics of the services users at that organisation (age range, types of impairment, numbers of participants who will be recruited)
5. Support Mechanisms for the Use Cases (description of the teachers and support workers that would support the project at each site, their ICT experience in using white boards, robots, and mobile devices; availability of school equipment that can be used in the project such as tablets, robots, interactive whiteboards including numbers and types)
6. Additional Information (if relevant)

3.2 Profound and Multiple Learning Disability Stakeholders (Mapped via the following MaTHiSiS partners: FMD, JYCL, Europole, RIX, NTU, UoN)

3.2.1 In UK

3.2.1.1 Oak Field School, Nottingham

Organisation Name	Oak Field School
Contact Details	<p>Head Teacher: Mr. David S. Stewart OBE B.A. (Hons) M.Ed. (Oxon) D.Litt.h.c. DL</p> <p>Address: Oak Field School & Sports College. Wigman Road, Bilborough, Nottingham. NG8 3HW</p> <p>E-mail: admin@oakfield.nottingham.sch.uk</p> <p>Telephone : 0115 9153265</p> <p>Fax: 0115 9153264</p> <p>Physio/OT T: 0115 883 5485</p> <p>Health T: 0115 883 5487</p>
General Description of the Organisation	The aim of the Oak Field School is to ensure that all pupils access the very best in educational opportunities, taking their rightful place within their community. The governors wish to see the school at the very heart of learning within the local and City community. As a Sports College the school works closely with a range of partners (including Dance 4, a local organization to promote healthy life styles via contemporary dance) to

	<p>ensure that health, fitness and leisure play a vital role not only in the school but in the community we serve.</p> <p>Oak Field wants their pupils to be ambitious, to have a sense that they can achieve and to challenge others' pre-conceptions. Above all they want them to feel safe, confident and ready to take their place in the world. The school is keen that the pupils have a voice in their community, which is respected and listened to.</p> <p>The School strives to be at the very heart of life within the City, providing a rich diet of opportunities. There are very active links with both local Universities (University of Nottingham and Nottingham Trent University, both of whom are MaTHiSiS partners) from which our pupils benefit from the very latest in research. They wish to harness the very latest in technologies which will enhance the skills and learning of the young people.</p> <p>In 2008 the school assumed Sports College Status, with ICT as a second subject. The school holds the International School Award, Youth Sport Trust Gold, Ability Nottingham, Basic Skills Award, Healthy Schools Gold, eTwinning Award, Let's Get Cooking Accredited and Arts Mark Gold.</p>
Description of the Characteristics of the Services users at that Organisation	Students aged 9-17 years old at the Oak Field School will be involved in the MaTHiSiS project. These students have a range of severe, profound and complex learning and/or physical disabilities. Fifteen students will be recruited to the project. In addition a group of older students (n=12) with severe learning disabilities will be involved in the project (especially in the Focus Groups) as part of the 'NICER' group – formed of ex-students from the Oak Field School who advise on, and review, technology projects in collaboration with UoN and NTU.
Support Mechanisms for the use cases	The school has a range of Interactive Whiteboards which can be used for the project and access to 24 Galaxy Notes 10.1. The school also has access to 2 NAO Humanoid robots (via collaboration with NTU) for use in the project.
Additional Information	NA.

Table 3 – The Oak Field School

3.2.1.2 Charlton Park Academy, Greenwich, London

Organisation Name	Charlton Park Academy
Contact Details	<p>Kathryn Stowell</p> <p>T: 020 8249 6844 F: 020 8317 8053</p> <p>E: k.stowell@charltonparkacademy.co.uk</p> <p>Address:</p> <p>Charlton Park Academy</p> <p>Charlton Site</p> <p>Charlton Park Road</p>

D2.1 – Formation of stakeholder groups

	London SE7 8HX
<p>General Description of the Organisation</p>	<p>Charlton Park Academy is a Secondary Special Academy for students with complex (11-19 years), low incidence special educational needs based in the London Royal Borough of Greenwich, UK.</p> <p>The school originated as part of the Open Air School movement in the early 1900's, designed to support young people with medical difficulties whilst growing up in London. Charlton Park Academy have friendly and experienced staff who are familiar with working with a wide range of young people with special educational needs – most of the staff have specialist qualifications and experience. The school trains and mentors all of their staff continuously to improve upon their standards of provision.</p> <p>They are constantly developing their excellent facilities and together with families and partnerships, they have achieved some fabulous outcomes for the young people and many return to share their news and successes. The school aims to support now and in the future, all their students, their parents/caregivers to develop and transform their lives and assist them in becoming happy and fulfilled both as adults and citizens and who are able to pursue their interests and dreams.</p> <p>The school has fully adopted the unique multimedia advocacy approach developed by RIX Research & Media. The School uses RIX Wikis for all 240 of its pupils and this year's Ofsted Residential Inspection Report has highlighted how the use of Wikis has enabled very effective person-centred planning.</p> <p>Over the years of partnership RIX Research and Media has developed a long term relationship with the Academy where teachers, parents and the young people are keen to trial the use of new technologies to support their communication, participation and independence. The Academy is always happy to participate in innovative research projects and they use a range of assistive technologies to maximize the autonomy of their learners.</p> <p>The management of the school has expressed their interest in participating in this project and provided a confirmation letter to confirm this.</p>
<p>Description of the Characteristics of the Services users at that Organisation</p>	<p>Charlton Park is a special academy for students with low incidence special educational needs. These school places primarily are for pupils for whom a special education setting is required. They have a small residential unit for pupils admitted with complex care needs benefiting from extended educational provision.</p> <p>All students applying must have a Single plan, EHC plan, or Statement of Special Educational Needs appropriate for placement in the school. Charlton Park Academy does not admit pupils with Emotional or Behavioural difficulties for health and safety reasons. They have a current population of vulnerable pupils. This means that virtually all pupils applying and admitted must have levels of attainment at Pre-national curriculum levels in English and Maths by year 6, and have complex and/or severe learning difficulties on their statement. Pupils with these needs have the priority placement and our total admission number at year 7 entry per year is set at 15 places. Eight students will be recruited – age range 11-19 years, with profound and multiple learning disabilities.</p>
<p>Support Mechanisms</p>	<p>Existing technologies routinely used in the school include: iPads (over 100</p>

D2.1 – Formation of stakeholder groups

for the use cases	iPads), Android Tablets, Whiteboards in each classroom, PC's, EyeGaze, 3D printers, Design Technology - Design Cutter, Sensory Guru Equipment, OMI interactive, Tomocco, personalised communication devices e.g. VOCA, Paphfinder and others. All staff are trained to use existing technologies and are experienced in using and supporting students to use existing hardware and software. Currently, there is no access to robots – so additional training will be required at the beginning of the pilot.
Additional Information	NA

Table 4 – Charlton Park Academy

3.2.2 In Italy

3.2.2.1 ITC V. Arangio Ruiz School, Rome.

Organisation Name	ITC V. Arangio Ruiz School
Contact Details	Cacciotto Giuseppe giuseppe.cacciotto@hotmail.it
General Description of the Organisation	Commercial technical secondary second grade school (students aged 15-18 years) based in Rome. Electronics and informatics are part of the school curriculum and the school has access to the related equipped laboratories. The involvement in the project is relevant for both the teachers and the students in terms of additional training opportunities.
Description of the Characteristics of the Services users at that Organisation	One class has been selected to participate in the project, composed of twenty two students aged 15 to 16 years. Among them one student has Asperger Syndrome, and two students have multiple learning disabilities.
Support Mechanisms for the use cases	The pilot will be organized at Fondazione Mondo Digitale, involving the different schools all at one time, or at the school. On in service teacher, one support teacher for students with special needs, two psychologists and one teacher with high level experience in educational robotics will be involved. The class is equipped with interactive whiteboard, PCs, 5 tablets, and 1 iPad.
Additional Information	The opportunity to involve the students at the University La Sapienza can be explored. They work with NAO robots and cooperate with FMD in the organisation of educational robotics training, targeting school students. In this case it could be more appropriate to conduct the piloting at Fondazione Mondo Digitale involving the different schools.

Table 5 – ITC V. Arangio Ruiz School

3.2.2.2 Istituto Comprensivo Lorenzi, Fumane

D2.1 – Formation of stakeholder groups

Organisation Name	Istituto Comprensivo Lorenzi
Contact Details	Antolini Emanuela – Director antolini@Europolee.org Valentina Cottin vice- Director vcottin@libero.it bimobile: 00393661698363 Via Pio Bugnol 36 37022 Fumane – Italy
General Description of the Organisation	Istituto comprensivo Lorenzi includes about 1000 students from 3 to 14 years old. It is a public school network consisting of 10 different schools in a mountain area around Verona. There are about 20 students with a Learning Disability at various levels (Cerebral Palsy, Downs Syndrome, Autistic Spectrum, and about twenty special need teachers to support them. The network can be further broken down into: <ul style="list-style-type: none"> • Three ‘Early Years’ schools with students from 3 – to 5 years old • Five Primary schools with students aged 5 – 10 years old • Three middle schools with students aged 10 – 14 years old
Description of the Characteristics of the Services users at that Organisation	There are about twenty students with a Learning Disability (3-14 years old) at various levels (Cerebral Palsy, Downs Syndrome, Autistic Spectrum), and about twenty special need teachers to support them. All will participate in the project as part of their curricula.
Support Mechanisms for the use cases	There are twenty special needs teachers, all experts in ICT robotics using computers with Linux and access to the Internet. A range of tablets are also available for use in the project.
Additional Information	NA

Table 6 – Istituto Comprensivo Lorenzi

3.2.2.3 Istituto Comprensivo Falcone Borsellino - Bardolino

Organisation Name	Istituto Comprensivo Falcone Borsellino
Contact Details	Ester Troiani, Vice- Director estertoriani@istruzione.it
General Description of the Organisation	Istituto Comprensivo Borsellino comprises ten schools including: <ul style="list-style-type: none"> • Four Primary schools, with students aged 5 – 10 years old. • Six middle schools, with students aged 10 – 14 years old. There are about twenty Learning Disabled pupils at different levels (Cerebral Palsy, Downs Syndrome, Autistic Spectrum, and about twenty special need teachers to support them.
Description of the Characteristics of the	Students are aged 5 -14 years old. They are all in inclusive education and all will participate in the project as part of their curricula. Students will

D2.1 – Formation of stakeholder groups

Services users at that Organisation	participate in small groups/class rooms, or individually and remotely.
Support Mechanisms for the use cases	There are twenty special needs teachers, all experts in ICT robotics with access to computers with Linux, the Internet, and a range of tablets.
Additional Information	NA

Table 7 – Istituto Comprensivo Falcone Borsellino

3.2.2.4 Istituto paritario “Virgo Carmeli”, Verona

Organisation Name	Istituto paritario “Virgo Carmeli”
Contact Details	Damiano Ceschi – Director ceschidamiano@gmail.com
General Description of the Organisation	Istituto paritario “Virgo Carmeli” includes about two hundred students from 1 to 10 years old. It is a private school in 3 different levels, in the southern area of Verona.
Description of the Characteristics of the Services users at that Organisation	There are about five Learning Disabled students at various levels with delayed cognitive development, Autism, Learning Disorder etc., and one special needs teacher to support them. Age range: 4 -10 years, all included in mainstream classrooms, and will participate in the project as part of their curricula.
Support Mechanisms for the use cases	There is one teacher who is an expert in ICT robotics, PCs access to the Internet, and two interactive whiteboards.
Additional Information	NA

Table 8 – Istituto paritario “Virgo Carmeli”

3.2.2.5 Il Mosaico – Società Cooperativa Sociale ONLUS, Picena

Organisation Name	Il Mosaico – Società Cooperativa Sociale ONLUS
Contact Details	via Contrada Alvata 12 – 62018 Porto Potenza Picena (MC) Elena Milli: elena.milli@ilmosaico.coop
General Description of the Organisation	The social cooperative Il Mosaico is located in Marche region and provides educational services to students (3 to 19 years old) with social and educational needs reported by Social Assistance, Schools and Health Centres, or to private clients. The staff are composed of pedagogy specialists, psychologists, professional educators, teachers, youth workers and skilled operators with considerable

D2.1 – Formation of stakeholder groups

	experience, and theoretical competence. They also manage a Specialised Centre for Diagnosis and Empowerment for Learning Difficulties officially recognised by the region Marche.
Description of the Characteristics of the Services users at that Organisation	<p>The students are from families with several issues: drugs and alcohol addiction, low educational levels, crime, social exclusion, psychiatric disorders, and from immigrant families.</p> <p>The private clients and young students sent by health centres and schools have special needs.</p> <p>From these it is possible to recruit two young students: one with conduct and emotional disorder issues with cerebral palsy aged 12 years, and one with moderate-to-severe learning disability and tetraparesis with cerebral palsy aged 19 years. There is also one case defined as in the autistic spectrum.</p>
Support Mechanisms for the use cases	<p>The professionals from this organisation involved in MaTHiSiS are:</p> <ul style="list-style-type: none"> - Barbara Morgoni: a pedagogy specialist with experience in working with children with special needs, learning disabilities and behavioural issues. She coordinates and creates specific care and social inclusion intervention projects. - Tania Taffi: a developmental psychologist and family psychotherapist. She is the coordinator of the psycho-pedagogical counselling service. <p>No availability of devices – low ICT experience</p>
Additional Information	NA

Table 9 – Il Mosaico – Società Cooperativa Sociale ONLUS

3.2.3 In Spain

3.2.3.1 Centro de Educación Especial nº 1, Valladolid

Organisation Name	Centro de Educación Especial nº 1.
Contact Details	<p>Address: C/ Joaquin Velasco Martín 17</p> <p>Postal Code: 47014 Valladolid</p> <p>T. +34 983 33 27 94</p>
General Description of the Organisation	<p>Special Education Centre, with seventy five pupils, forty nine of whom have profound and multiple learning disabilities. The school has twenty four teachers (twenty two support teachers and three specialists in language, fourteen educational assistants, three physiotherapists and two nurses. They have received training on "experimenting and learning with tablets". The centre has at least one whiteboard. The head team is willing of participate in the MaTHiSiS project, believing that it will enrich either the pupils and teachers, and other staff at the school.</p>

D2.1 – Formation of stakeholder groups

Description of the Characteristics of the Services users at that Organisation	Students aged 6-19 years old will be involved. They have a range of severe and profound learning and/or physical, and/or psychological disabilities. At least fifteen students will be recruited to the project.
Support Mechanisms for the use cases	The school has interactive whiteboards and tablets that can be used for the project within the pilot phases. No robots are available at the school.
Additional Information	NA

Table 10 – Centro de Educación Especial nº 1

3.2.3.2 CENTRO DE EDUCACIÓN ESPECIAL “SAN JUAN DE DIOS”, Valladolid.

Organisation Name	CENTRO DE EDUCACIÓN ESPECIAL “SAN JUAN DE DIOS”
Contact Details	Noemí SILVA GANSO Avenida de Madrid, nº 68 47008 Valladolid +34 983 22 28 75
General Description of the Organisation	<p>“Centro San Juan de Dios” is a nonprofit organisation associated with the Hospitaller Order of St. John of God.</p> <p>The aim of this Special School “San Juan de Dios” is to develop students’ abilities and competences oriented to practical knowledge and daily living skills to promote their social and professional integration.</p> <p>Pupils receive personalised education, based in a respectful and flexible environment.</p> <p>The Centre is highly interested in the tools being developed in the MaTHiSiS project.</p>
Description of the Characteristics of the Services users at that Organization	<p>The main facts for this organization are:</p> <ul style="list-style-type: none"> • More than seventy pupils are catered for ranging from 12-23 years old. • Types of impairment include: Multiple and profound learning difficulties and intellectual disabilities. • The school has thirteen teachers (eight support teachers, one speech therapist teacher, and four vocational trainers), two physiotherapists, thirteen educational assistants and one educational counsellor. • The centre has a computer lab available for use during the project.
Support Mechanisms for the use cases	<p>Number of participants that will be available to work in the user requirements specifications and in the pilots include one teacher and five students.</p> <p>One computer lab is available for use in the project.</p>
Additional	This school belongs to the same nonprofit entity identified in table 36, and is an instance where the same (umbrella) organisation will provide students

Information	for both the PMLD and Industrial Training cases.
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Table 11 - CENTRO DE EDUCACIÓN ESPECIAL “SAN JUAN DE DIOS”, Valladolid.

3.3 Autistic Spectrum Stakeholders (Mapped via the following MaTHiSiS Partners: FMD, JYCL, NTU, RIX, LCDS)

3.3.1 UK

3.3.1.1 Foxwood Academy, Nottingham (schools below have been converted to tables, but not cross reference to consolidated comments.

Organisation Name	Foxwood Academy
Contact Details	Derby Road, Bramcote, Nottingham, NG9 3GF. Main contact: head teacher, Chris Humphreys 0115 9177202 chumphreys@foxwood.notts.sch.uk
General Description of the Organisation	Foxwood Academy is a special school lying to the west of Nottingham. It caters for children aged between 3-19 years of age with a wide range of needs and abilities. The school commissions support from other professionals who provide speech and language therapy, occupational therapy and physiotherapy to support students in all areas of their life. All students have inclusive access to a curriculum and additional services that prepare them very effectively for life. The school has specialist status for applied learning and technology and is committed to promote excellence in Technology, Applied Learning and Life Skills for young people and adults with special educational needs regardless of background and starting points and encouraging greater inclusiveness into a society of independent citizens.
Description of the Characteristics of the Services users at that Organisation	The school has approximately one hundred pupils on its roll at any one time. All pupils have learning difficulties and a large proportion have specific difficulties associated with a diagnosis of Autism. Many pupils have additional communication, sensory needs, physical needs or specific medical needs including epilepsy. The school could thus contribute to both the PMLDC and the lower functioning autism uses cases. Theoretically there is no limit to how many could be recruited.
Support Mechanisms for the use cases	Having special technology status means that the school is well equipped with technology especially tablets and interactive whiteboards as well as expertise and specialist support. The speech and language therapists will be nominating participants for the project and they have their own unit where the research team could work with students on one to one basis. Tablets are used here and one of the interactive whiteboards.
Additional Information	The school is really enthusiastic about being involved in the project.

Table 12 – Ffooxwood Academy

3.3.1.2 Rosehill School, Nottingham

Organisation Name	Rosehill School.
Contact Details	St Matthias Road, Nottingham, NG3 2FE. Main contact: Cheryl Steele (Deputy Head) 0115 915 5815 c.steele@rosehill.nottingham.sch.uk
General Description of the Organisation	Day school for children with autism and learning disabilities aged 4 to 19 years. It is a non-denominational community special school maintained by the Nottingham City Education Authority for boys and girls aged 4 -19 years. It provides day education for children and young people with autistic spectrum disorders whose learning challenges are best served in a special school setting. Currently, there are approximately one hundred pupils on roll. Rosehill School has been specialist provision for pupils with autism since 1980. The school caters for the needs of pupils with a wide range of abilities and differences associated with the spectrum of autism. It provides a broad and balanced education enabling pupils to achieve their full academic and social potential and preparing them for adult life. The Ofsted report of March 2013 awarded the school as outstanding in all areas.
Description of the Characteristics of the Services users at that Organisation	Pupils who attend Rosehill School will all have been diagnosed as having an autism spectrum disorder. Unlike Sutherland House, (Section 0) Rosehill pupils have intellectual disabilities so would be suitable for the PMLDC although some of the more able might fit the requirements of the ASC. Determining numbers who could be recruited is rather difficult as, after two visits. There are facilities for one to one teaching.
Support Mechanisms for the use cases	The school has at least one interactive whiteboard and uses tablets, which can be used for the pilot.
Additional Information	Scoping of user requirements will have to take place on site.

Table 13 – Rosehill School**3.3.1.3 Sutherland House, Nottingham.**

Organisation Name	Sutherland House
Contact Details	Bath Street, Nottingham NG1 1DA. Main contact: Chris Leach (Head of IT) T: 0115 960 9263 chris.leach@autismeastmidlands.org.uk
General Description of the Organisation	Sutherland House is a specialist day school for pupils and students with autism aged 3 to 19 years. Pupils attend on a daily basis and are placed at the school by Local Authorities throughout the East Midlands. The school's overall objective is to provide the highest quality specialist education, addressing the specific needs of autism as well as the individuality of each pupil and his or her family. It has exceptionally high staffing ratios and

D2.1 – Formation of stakeholder groups

	employs a range of specialists including speech and language therapists, psychologists, music specialists and occupational therapists. The school is committed to the broad principles of inclusion and a number of pupils have periods of mainstream educational experience as part of their individual education plan.
Description of the Characteristics of the Services users at that Organisation	All pupils have a diagnosis of autism and have been placed in the school by the local authorities after it has been found that they are unable to benefit from mainstream education. They are organised into three age bands; lower, middle and upper school. Within these bands they are organised according to ability. We met a range of pupils: one is taking Physics A level but others, even in the upper school, struggle with basic concepts of number so could be described as having intellectual disabilities. There are currently ninety five enrolled pupils within the 3-19 age range but this will increase when the school soon takes students up to the age of 25 years.
Support Mechanisms for the use cases	The school has recently moved to new premises where they are all under one roof having previously been housed on one site. Their new premises include a dedicated IT suite although pupils will use mobile devices in other classrooms. The IT suite has roughly 16 desktops linked to their own network. It also has an interactive whiteboard.
Additional Information	NA

Table 14 – Sutherland House School

3.3.2 Italy

There are a range of Italian schools, and school-consortia, from the PMLDC that will also provide students for the ASC. Examples can be seen in sections 2.2.2.1-2.2.2.3.

3.3.2.1 IC Rita Levi Montalcini School, Rome.

Organisation Name	IC Rita Levi Montalcini School
Contact Details	Annalisa Costa anna.tennis@tiscali.it
General Description of the Organisation	<p>Primary and secondary first grade public school (students aged 3 to 14 years) based in Rome.</p> <p>The school has distinguished itself in recent years in the training of teachers linked to new technologies and initiatives related to innovative teaching. It counts on a professionally prepared staff, in particular regarding the education of students with special needs. The school board is in favour of participation in experimental projects that enrich the training of teachers. The relationship between teachers and families is very good.</p> <p>Two teachers are willing to be involved in the project (one in-service teacher and one support teacher).</p>
Description of the Characteristics of the Services users at that	Twenty one students aged 8-9 years, one with Fragile X Syndrome aged 8 years, and two with Emotion Dysregulation in Attention Deficit Hyperactivity Disorder aged 8 years.

D2.1 – Formation of stakeholder groups

Organisation	
Support Mechanisms for the use cases	The pilot will be either organised at Fondazione Mondo Digitale involving the different schools at the same time, or located in the individual schools. Two teachers, one in-service, and one support teacher for students with special needs will be involved in the project. Both have experience in using ICT for teaching and learning. The class is equipped with IWB, PC and 6 tablets, available for use in the pilot stages.
Additional Information	The opportunity to involve the students at the University La Sapienza can be explored. They are involved in NAO robot-related projects, and the University has access to such robots and cooperates with FMD in the organisation of educational robotics training targeting school students. In this case it may be more appropriate to conduct the piloting at Fondazione Mondo Digitale involving the various schools.

Table 15 – IC Rita Levi Montalcini School

3.3.2.2 ITC V. Arangio Ruiz School Rome.

This school is the same as identified in table 5 and is an instance where a school will provide students for both the ASC and PMLDC.

3.3.2.3 Association FareABA, Rome.

Organisation Name	Association FareABA
Contact Details	Eleonora Reali
General Description of the Organisation	FareABA is an association of psychologists that deals with Autism and Pervasive Developmental Disorders. It is based in Rome and cooperates with schools and families, providing assistance to children with special educational needs.
Description of the Characteristics of the Services users at that Organisation	Children with high functioning autism aged 10 and 11 years.
Support Mechanisms for the use cases	Two children with high functioning autism aged 10 and 11 years will be involved in the project. Two psychologists will also be involved, specialising in Clinical Childhood, Adolescence and Family Psychology. Both have experience in using mobile technologies for psychotherapy and behavioral interventions. The pilot will be organized either at Fondazione Mondo Digitale involving the various schools, or at each of the individual schools.
Additional Information	The opportunity to involve the students at the University La Sapienza can be explored. They are involved in NAO-related projects, have access to NAO robots, and cooperate with FMD in the organization of educational robotics training targeting school students. In this case it could be may appropriate

	to conduct the piloting at Fondazione Mondo Digitale involving the various schools.
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Table 16 – Association FareABA

3.3.2.4 Organisation name Il Mosaico – Società Cooperativa Sociale ONLUS

This school is the same as identified in table 9 and is an instance where a school will provide students for both the ASC and PMLDCs.

3.3.2.5 Association “Applied Behavioural Spectrum Services, Rome.

Organisation Name	Association “Applied Behavioral Spectrum Services”
Contact Details	Martina Marraffa ContactUs@appliedbehaviorals.com
General Description of the Organisation	<u>Applied Behavioural Spectrum Services</u> is an association of psychologists dealing with Autism and Pervasive Developmental Disorders. It is based in Rome and cooperates with schools and families, providing assistance to children with special educational needs.
Description of the Characteristics of the Services users at that Organisation	Children with high functioning autism aged 8 to 11 years.
Support Mechanisms for the use cases	Two children with high functioning autism aged 10 and 11 years will be involved in the project. Two psychologists will also be involved; they have a background in Clinical Childhood, Adolescence and Family Psychology. Both have experience in using mobile technologies for psychotherapy and behavioral interventions.
Additional Information	NA

Table 17 - Association “Applied Behavioural Spectrum Services, Rome.

3.3.3 Spain

3.3.3.1 CCEE “EL CORRO” - Centro Concertado de Educación Especial “El Corro”, Valladolid

Organisation Name	Centro Concertado de Educación Especial “El Corro”
Contact Details	Address: C/ Villabañez, Nº 151. Postal Code: 47012 Valladolid Telephone: +34 983 291 078
General Description of the Organisation	El Corro is a Special Education Centre that belongs to the Valladolid Autism Association which is a non-profit organisation, declared of public interest on

	<p>February 11th, 2002. The association began in 1981, giving psycho-educational response to a group of children with autism. They created a school called “El Corro”. There are thirty eight pupils, ranging from 3 to 20 years old with autism spectrum disorder.</p> <p>The school has twelve teachers (eight support teachers, three specialists in language, one vocational trainer), six educational assistants and two educational counsellors. They have received training on the educative use of smartboards. The centre has at least one whiteboard. The head of the team is willing of participate in projects (such as MaTHiSiS) that enrich either the pupils and teachers, and other staff at the school.</p>
Description of the Characteristics of the Services users at that Organisation	The whole school is willing to participate in the MaTHiSiS pilots. High numbers of students can be recruited, and this depends on the ability levels required for each of the three categories of the autism use case.
Support Mechanisms for the use cases	The school has an interactive whiteboard, computers and tablets that can be used for the project. No robots are available for use at this school.
Additional Information	<p>This school has pupils in combined schooling with one of our schools for the mainstream Use Case (CC “Centro Cultural Vallisoletano”)</p> <p>Methodological strategies used at this school includes:</p> <ul style="list-style-type: none"> - Structured and predictable environments. - Learning without error and functional. - Chain back training methodologies - Physical Molding. - Incidental learning. - Use of visual aids. <p>For communication, alternative and Augmentative Communication Systems are used.</p>

Table 18 – Centro Concertado de Educación Especial “El Corro”

3.4 Mainstream Education Stakeholders (Mapped via the following MaTHiSiS partners: NTU, FMD, IMOTEC, JYCL, LCDS)

3.4.1 In UK:

3.4.1.1 The Nottingham Bluecoat Academy, Nottingham.

Organisation Name	Nottingham Bluecoat Academy
Contact Details	<p>Steve Li,</p> <p>Head of Computer Science,</p> <p>Bluecoat School, Aspley Lane, Nottingham, NG8 5GY</p>
General Description of	The Nottingham Bluecoat Academy is a Church of England School with

D2.1 – Formation of stakeholder groups

the Organisation	pupils aged 11-18 years, and a primary school (3-11years) currently being built. The school operated across two campuses. The Nottingham Bluecoat School was founded as the first charity school in Nottingham in 1706. Today the School is a vibrant, diverse community of almost 2,000 learners including SEN and children from mixed ethnicity backgrounds. The School is founded on the principle of a Christian faith education for all. Their mission is to provide the best possible education in a supportive and disciplined environment where each student is seen as an individual. The school has strengths in technology, science, ICT/Computing, arts numeracy and literacy. The school believes that effective learning takes a multitude of forms. Some of this happens in traditional classrooms with familiar methods but the school promotes new ways of learning which include taking learning beyond the classroom, such as through their international links with South Africa, Italy, France, Germany and Jamaica to allow students to explore unfamiliar places and enrich their knowledge and understanding.
Description of the Characteristics of the Services users at that Organisation	Children are aged 11-18 years. The school is currently building a primary school which will include children aged 5-11 years. Some children may have learning impairments such as English as a Second Language, autism (low level), and SEN.
EALSupport Mechanisms for the use cases	Children who are on action/action plus [26] (different types of educational support available to children with SEN) may have teaching assistants in some, or all lessons, depending on the needs of the students. The teachers involved in the project are all computing teachers and therefore have experience of using robots and mobile devices. While all teachers can use an IWB, not all classrooms have them. In terms of this project some students may need larger text and different coloured backgrounds.
Additional Information	NA

Table 19 – Nottingham Bluecoat Academy

3.4.1.2 The Emmanuel School, Nottingham

Organisation Name	The Emmanuel School
Contact Details	Contact: Mr Asher Levin, Director of Inclusion. Email: ale@emmanuel.nottingham.sch.uk The Nottingham Emmanuel School, Gresham Park Road, West Bridgford, Nottingham, NG2 7YF Tel: 0115 977 5380
General Description of the Organisation	This is a Church of England school for students ranging from 11-18 years, which welcomes young people with or without a faith or from diverse backgrounds. There are over a thousand pupils. The school converted to academy status in June 2013 as a Church of England academy, and is an average-sized secondary school. The proportion of students within the academy from minority ethnic groups and of those who speak English as an additional language is well above average, as is the proportion of students for whom the academy receives pupil premium funding (additional funding from the government). The proportion of disabled students and those who have special educational needs is also above the national average. The school is a member of the Transform Teaching Schools Alliance. The school is proud of its Christian distinctiveness, its sharing with, and learning from, people of other faiths, or no faith. Standards and expectations are high and an ambitious culture of learning is developed through a wide range of engaging and enterprising educational opportunities, both within, and beyond the classroom.
Description of the Characteristics of the Services users at that Organisation	11-18 year school. Children are taught in mixed groups. Some children will have impairments such as EAL, autism (low level), EACP, SEN.
Support Mechanisms for the use cases	Students with impairments such as EAL, autism (low level), SEN will be involved in the user requirements analysis and pilots.
Additional Information	

Table 20 – The Emmanuel School

3.4.2 In Italy

There are a range of Italian schools, and school-consortia, from the PMLDC and ASC that will also provide students for the MEC. Examples can be seen in 2.2.2.1 (PMLD), 3.3.2.1 (Autism), 3.3.2.2 (Autism), 3.3.2.3 (Autism).

3.4.2.1 IC Rita Levi Montalcini School

See Table 12 for full details of this school.

3.4.2.2 ITC V. Arangio Ruiz School

See table 5 for full details of this school.

3.4.2.3 IC Via Pasquale Stabilini, Rome.

Organisation Name	IC Via Pasquale Stabilini
Contact Details	Vittoria Mazzeo mazzeo.vittoria@tiscali.it
General Description of the Organisation	<p>Primary and secondary first grade public school based in Rome. Students are aged 3 to 14 years.</p> <p>The school is an example in the Rome area for applying a student-centred pedagogical approach. It has been one of the first schools in Rome to introduce educational robotics within the curriculum.</p>
Description of the Characteristics of the Services users at that Organisation	<p>One class will be involved in the project, composed of twenty two students aged 9 years. Among them one student with cognitive borderline personality disorder, two students with attention-deficit/hyperactivity disorder ADHD, two students with other specific learning difficulties (dyslexia).</p>
Support Mechanisms for the use cases	<p>Seventeen students will be involved in elicitation of user requirements and piloting activities.</p> <p>The pilot can either be organized at Fondazione Mondo Digitale involving the different schools all at the same time, or at the individual schools.</p> <p>The teachers involved have experience in educational robotics. The class is equipped with PCs and an interactive whiteboard available for use in the project.</p>
Additional Information	<p>The opportunity to involve the students of University La Sapienza can be explored. The University has access to NAO robots, students and cooperates with FMD in the organization of educational robotics training targeting school students. In this case it could be more appropriate to conduct the piloting at Fondazione Mondo Digitale involving different schools.</p>

Table 21 – IC Via Pasquale Stabilini

3.4.2.4 Istituto Comprensivo “ Sandro Penna” Battipaglia, Salerno

Organisation Name	Istituto Comprensivo “ Sandro Penna” Battipaglia (SA)
Contact Details	<p>Paoletta Aurora Lucia aurora@alice.it</p> <p>via Salvator Rosa, 84091 Battipaglia (SA)</p>

D2.1 – Formation of stakeholder groups

General Description of the Organisation	<p>Primary and secondary first grade public school (students aged 3 to 14 years) based in Battipaglia, (Salerno).</p> <p>The school offers innovative teaching initiatives for the training of teachers linked to new technologies. It counts on a professionally prepared staff, in particular regarding the education of students with special educational needs. The school board is in favour of participation in experimental projects that enrich the training of teachers.</p> <p>The relationship between teachers and families is very good.</p>
Description of the Characteristics of the Services users at that Organisation	Students range from 3-14 years, and are in mainstream education.
Support Mechanisms for the use cases	The school has an interactive whiteboard, computers and tablets that can be used for the project. No robots are available for use at this school.
Additional Information	The school is really enthusiastic about being involved in the project.

Table 22 - Istituto Comprensivo “ Sandro Penna” Battipaglia, Salerno

3.4.2.5 Istituto Tecnico Nautico Giovanni XXIII di Salerno

Organisation Name	Association “Applied Behavioral Spectrum Services”
Contact Details	Martina Marraffa ContactUs@appliedbehaviorals.com
General Description of the Organisation	Applied Behavioral Spectrum Services is an association of psychologists dealing with Autism and Pervasive Developmental Disorders. It is based in Rome and cooperates with schools and families, providing assistance to children with special educational needs.
Description of the Characteristics of the Services users at that Organisation	Children with high functioning autism aged 8 and 11 years.
Support Mechanisms for the use cases	<p>Two children with high functioning autism aged 10 and 11 years will be involved in the project.</p> <p>Two psychologists will also be involved; they have a background in Clinical Childhood, Adolescence and Family Psychology. Both have experience in using mobile technologies for psychotherapy and behavioral interventions.</p>
Additional Information	NA

Table 23 - Istituto Tecnico Nautico Giovanni XXIII di Salerno

3.4.2.6 Istituto Tecnico Nautico Giovanni XXIII di Salerno

Organisation Name	ISIS GIOVANNI XXIII SALERNO
Contact Details	Via Moscati, 4 - 84134 Salerno Iolanda Della Monica sais00600e@istruzione.it
General Description of the Organisation	Secondary education school providing primary, secondary and mainstream education with additional engineering studies. There are over one thousand, three hundred students at the school. It is a typical, IT-oriented mainstream education school.
Description of the Characteristics of the Services users at that Organisation	Students range in age from 13-18 years and are in mainstream education. Up to twenty five students could be recruited to participate in the project from one class.
Support Mechanisms for the use cases	The school is particularly interested in technology driven education. They have experience in using ICT tools, which are relevant to the project (whiteboards, mobile devices, and tablets). Equipment and facilities available for use in the project include two computer labs (equipped with whiteboards.) Robots are not available for use in the project at the moment.
Additional Information	NA

Table 24 - Istituto Tecnico Nautico Giovanni XXIII di Salerno

3.4.3 In Lithuania

3.4.3.1 Gymnasium of Kaunas University of Technology, Kaunas.

Organisation Name	Public Institution Gymnasium of Kaunas University of Technology
Contact Details	Tomas Kivaras (Director) Tel.: +37067578188 E-mail: tomas.kivaras@ktug.lt Leonas Narkevičius (Teacher) Tel.: + 370 611 31569 E-mail: leonas@ktug.lt Studentų str. 65, Kaunas http://ktug.lt/
General Description of	Kaunas University of Technology Gymnasium was founded in 1989 and

D2.1 – Formation of stakeholder groups

the Organisation	<p>became the first university secondary school for gifted children in Lithuania. According to the Lithuanian national evaluation sources KTU Gymnasium ranks the 2nd position among Lithuanian gymnasiums and secondary schools for the third time in a row. The Gymnasium has one 1st-year, three 2nd-year, three 3rd-year, and three 4th-year classes which students annually win the highest awards in international competitions. There are over three hundred students attending the school.</p> <p>The Gymnasium is a typical IT-oriented mainstream education school.</p>
Description of the Characteristics of the Services users at that Organisation	Students range from 13-18years, and are in mainstream education.
Support Mechanisms for the use cases	<p>Up to twenty five students could be recruited to work in the project. One to two members of staff will be involved in the project as experts, and will be useful for the user requirements elicitation part of the project.</p> <p>Teachers have an advanced experience in using ICT tools relevant to this project (whiteboards, mobile devices, i.e. tablets). Equipment and facilities available for use in the project includes two computer labs (10 to 24 PCs) equipped with whiteboards (one per lab). Robots are not available at the moment.</p>
Additional Information	NA

Table 25 – Gymnasium of Kaunas University of Technology

3.4.3.2 Lyceum of Engineering of Kaunas University of Technology, Kaunas

Organisation Name	Lyceum of Engineering of Kaunas University of Technology
Contact Details	<p>dr. Dainius Žvirdauskas Director Tel. +370 37 312060 E-mail: direktorius@inzinerijoslicejus.ktu.edu S.Lozoraičio g. 13, LT - 50137, Kaunas www.inzinerijoslicejus.ktu.edu</p>
General Description of the Organisation	This is the first engineering lyceum in Lithuania providing primary, secondary and main education. Studies are specialised and integrate engineering curricula. There are over one thousand, one hundred students and it is a typical IT-oriented mainstream education school.
Description of the Characteristics of the Services users at that Organisation	Students range in age from 13-18 years, and are in mainstream education. Numbers of participants who could be recruited to work in the project will be drawn from one class up to twenty five students. One to two teachers will be involved in the elicitation of user requirements and in the piloting

D2.1 – Formation of stakeholder groups

	activities of the project.
Support Mechanisms for the use cases	Leading STEAM school. Advanced experience in using ICT tools relevant to the MaTHiSiS project (whiteboards, mobile devices, i.e. tablets). Equipment and facilities available for use in the project includes two computer labs (10 to 15 PCs in total) with whiteboards (one per lab). Robots are not available for use in the project at the moment.
Additional Information	NA

Table 26 – Lyceum of Engineering of Kaunas University of Technology

3.4.3.3 Lithuanian Health Sciences University Gymnasium, Kaunas

Organisation Name	Lithuanian Health Sciences University Gymnasium
Contact Details	Arūnas Bučnys (Director) Seredžiaus str. 4, 47182 Kaunas Tel. +370 686 54753 E-mail: direktorius@ismugimnazija.lt http://www.ismumokykla.lt
General Description of the Organisation	This is a private school in the district of Kaunas, providing secondary and main education, and owned by the Lithuanian University of Health Sciences. There are over six hundred students. It is a typical IT-oriented mainstream education school. One to two staff members will be involved in the project activities.
Description of the Characteristics of the Services users at that Organisation	Students range from 13-18 years in age and are in mainstream education. Participants who could be recruited for participation in the project come from one class, and includes up to twenty five students. One to two teachers will also be involved in the requirements elicitation and piloting phases of the project.
Support Mechanisms for the use cases	The school is highly interested in technology driven education. There is a wide experience in using ICT tools relevant to the project (whiteboards, mobile devices, and tablets). Equipment and facilities available for use includes two computer labs (10 to 15 PCs) with whiteboards (one per lab). Robots are not available at the moment.
Additional Information	NA

Table 27 – Lithuanian Health Sciences University Gymnasium

3.4.3.4 Vilnius Engineering Lyceum, Vilnius.

Organisation Name	Vilnius Engineering Lyceum
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D2.1 – Formation of stakeholder groups

Contact Details	Regina Mikalauskiene (Director) Antakalnio str. 120, Vilnius Tel. +370 5 234 2084 E-mail: regina.mikalauskiene@vilnius.lt http://www.dauksos.lt/
General Description of the Organisation	Secondary education school providing primary, secondary and mainstream education with additional engineering studies. There are over one thousand, three hundred students at the school. It is a typical, IT-oriented mainstream education school. One to two staff members will be involved in the project activities as experts.
Description of the Characteristics of the Services users at that Organisation	Students range in age from 13-18 years and are in mainstream education. Up to twenty five students could be recruited to participate in the project from one 1 class. One to two teachers will also participate.
Support Mechanisms for the use cases	The Lyceum is an organization with a great interest in technology driven education. They have experience in using ICT tools which are relevant to the project (whiteboards, mobile devices, and tablets). Equipment and facilities available for use in the project include two 2 computer labs (comprising some 10 to 15 PCs) with whiteboards (one per lab). Robots are not available for use in the project at the moment.
Additional Information	NA

Table 28 – Vilnius Engineering Lyceum

3.4.3.5 Klaipeda "Ažuolyno" Gymnasium, Klaipėda.

Organisation Name	Klaipeda "Ažuolyno" Gymnasium
Contact Details	Vilija Prižgintienė (Director) Paryžiaus Komunos str. 16 LT-91166 Klaipėda Tel. +370 46 383506 E-mail: vilija.prizgintiene@gmail.com http://www.azuolynas.klaipeda.lm.lt/
General Description of the Organisation	This organization is a secondary school in Klaipeda, providing general secondary education. There are over six hundred students. It represents a typical IT-oriented mainstream education school. One to two members of staff will be involved in the project activities, acting as experts.
Description of the Characteristics of the Services users at that	Students range in ages from 13-18 years, and are in mainstream education. Up to twenty five students could be recruited to participate in the project from one 1 class. One to two teachers will also participate.

D2.1 – Formation of stakeholder groups

Organisation	
Support Mechanisms for the use cases	The Gymnasium is an organisation with a great interest in technology driven education. They have experience in using ICT tools which are relevant to the project (whiteboards, mobile devices, and tablets). Equipment and facilities available for use in the project include two 2 computer labs (comprising some 10 to 15 PCs) with whiteboards (one per lab). Robots are not available for use in the project at the moment.
Additional Information	NA

Table 29 – Klaipeda "Ažuolyno" Gymnasium

3.4.3.6 Panevezys Juozas Balcikonis Gymnasium, Panevėžys.

Organisation Name	Panevezys Juozas Balcikonis Gymnasium
Contact Details	Raimondas Dambrauskas (Director) Respublikos str. 47, Panevėžys Tel. +370 45 461421 E-mail: rdambrauskas@gmail.com http://www.jbgimnazija.lt/
General Description of the Organisation	The Panevezys Juozas Balcikonis Gymnasium is a secondary state school located in Panevėžys, Lithuania. Juozo Balčikonio gimnazija is consistently one of the top-ranked institutions in Lithuania for the high quality of its teaching, long lasting traditions and notable alumni. There are over seven hundred students. It is a typical IT-oriented mainstream education school. One to two staff members will be involved in the project activities acting as experts.
Description of the Characteristics of the Services users at that Organisation	Students range in ages from 13-18 years, and are in mainstream education. Up to twenty five students could be recruited to participate in the project from one 1 class. One to two teachers will also participate.
Support Mechanisms for the use cases	The school is an organisation with a great interest in technology driven education. They have experience in using ICT tools which are relevant to the project (whiteboards, mobile devices, and tablets). Equipment and facilities available for use in the project include two 2 computer labs (comprising some 10 to 15 PCs) with whiteboards (one per lab). Robots are not available for use in the project at the moment.
Additional Information	NA

Table 30 – Panevezys Juozas Balcikonis Gymnasium

3.4.4 In Spain

3.4.4.1 CEIP “MIGUEL DE CERVANTES”, Valladolid.

Organisation Name	CEIP “MIGUEL DE CERVANTES”
Contact Details	Address: C/ Arca Real 8 Postal Code: 47013 Valladolid T. +34 983 23 03 76 Head teacher: Sebastián Gómez
General Description of the Organisation	CEIP “MIGUEL DE CERVANTES”,
Description of the Characteristics of the Services users at that Organisation	<p>Main facts:</p> <ul style="list-style-type: none"> • This is an infant and primary school. • Over 200 pupils attend, and ages range from 3 to 12 years old. • Students are bilingual (with English.) • School teachers have been trained in using smart boards for educative uses. <p>The head team is willing to participate in projects like MaTHiSiS that enrich either the pupils or teachers.</p> <p>Students’ ages range from 3-12 years, and are in mainstream education. In each class there are at least 2 students with learning difficulties.</p>
Support Mechanisms for the use cases	<p>Two classes, with up to thirty students will be involved in the MaTHiSiS project. Two to three teachers will also be involved.</p> <p>Teachers have experience in using smart boards, tablets and computers, but not with robots.</p> <p>There are smart boards in every classroom that can be used for the project.</p>
Additional Information	Higher numbers of students can be recruited if needed.

Table 31 – CEIP “MIGUEL DE CERVANTES”

3.4.4.2 CEIP “ PROFESOR TIERNO GALVÁN”, Valladolid.

Organisation Name	Centro de Educación Infantil y Primaria “Profesor Tierno Galván”
Contact Details	Address: C/ Manuel Silvela s/n Postal Code: 47014 Valladolid Head Teacher: Gloria Diez
General Description of the Organisation	<p>Main facts:</p> <ul style="list-style-type: none"> • This is an infant and primary school.

D2.1 – Formation of stakeholder groups

	<ul style="list-style-type: none"> • There are more than six hundred pupils. • The head teacher is willing to participate in projects such as MaTHiSiS that enrich either the pupils, and/or the teachers.
Description of the Characteristics of the Services users at that Organisation	Student's ages range from 3-5 years old, and are in mainstream education. In each class there are at least two students with learning difficulties.
Support Mechanisms for the use cases	Students from one class, with up to 20 students will be involved in the project. One to two teachers will also be involved. Teachers at the school have experience in using smart boards and computers, but not with robots. There are six smart boards in the school that can be used as part of the project.
Additional Information	NA

Table 32 – CEIP “ PROFESOR TIERNO GALVÁN”,

3.4.4.3 CEIP “JOAQUÍN DÍAZ”, Valladolid

Organisation Name	CEIP “JOAQUÍN DÍAZ” - Centro de Educación Infantil y Primaria “Joaquín Díaz”
Contact Details	Address: C/ Murillo Postal Code: 47193- La Cisterniga- Valladolid T. +34 983 40 47 16 Head Teacher: Fernando Herrero.
General Description of the Organisation	Main Facts: <ul style="list-style-type: none"> • This is an infant and primary school. • There are around five hundred and seventy pupils, with ages ranging from 3 to 12 years old. • School teachers have received training on smart boards for educative use, management of ICT resources, and didactic blogs' design. • The head team is willing to participate in projects like MaTHiSiS that enrich either the pupils and/or the teachers.
Description of the Characteristics of the Services users at that Organisation	Students' ages range from 3-12 years, and are in mainstream education. In each class there will be at least 2 students with learning difficulties.
Support Mechanisms for the use cases	Two classes, of up to 30 students, and one to two teachers will be involved in the project. Teachers have experience in using smart boards, tablets and computers, but not with robots. There are smart boards in every classroom.

Additional Information	NA
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Table 33 – CEIP “JOAQUÍN DÍAZ

3.4.4.4 CC “Colegio Cultural Vallisoletano”, Valladolid.

Organisation Name	CC “Colegio Cultural Vallisoletano”
Contact Details	Address: C/ Arzobispo García Goldaraz Postal Code: 47007 Valladolid Telephone: +34 983 23 08 00
General Description of the Organisation	Infant, primary and secondary school. This is a bilingual school with English. The school has more than five hundred pupils, with ages ranging from 3 to 16 years old. The head team is willing of participate in projects such as MaTHiSiS that enrich either the pupils, and/or, the teachers.
Description of the Characteristics of the Services users at that Organisation	Students are aged 3 to 16 years old. A proportion of the students also have special educational needs.
Support Mechanisms for the use cases	At least 20 students will be recruited to work in the MaTHiSiS project. Students will be drawn from a mainstream classroom, where there are also some students with autism and learning difficulties. The school has interactive whiteboards and computers that can be used for the project. No robots are available at this school for use in the project.
Additional Information	This is an inclusive education school and has pupils available for use in the ASC.

Table 34 – CC “Colegio Cultural Vallisoletano”

3.5 Industrial Training Stakeholders (Mapped via the following MaTHiSiS partners: AV, DXT, JCYL)

3.5.1 In France

3.5.1.1 THALES AVIONICS

Organisation Name	THALES AVIONICS
Contact Details	Olivier GUERINEAU guerineau@aerospace-valley.com +33 6 89 84 97 23

D2.1 – Formation of stakeholder groups

General Description of the Organisation	<p>Thales is a renowned leading supplier of avionics suites, components, and onboard instruments for Airbus and all major global air-framers. The factory to be opened in 2017 will employ two thousand four hundred staff. Thales is a large company and regularly carries out internal training. The company is highly interested in the tools being developed in the MATHiSiS project. In addition, they already pre-identified 2 potential learning goals:</p> <ul style="list-style-type: none"> • Avoidance and understanding of the risks associated with electrostatics in the manufacturing chain. • Training of customers to install, use and properly maintain Thales' products.
Description of the Characteristics of the Services users at that Organisation	<p>Main facts:</p> <ul style="list-style-type: none"> • Beneficiaries range in age range from 18-65 years. • Types of impairment: these are not specified as yet. • Number of participants: to be defined according to the type of training that is developed using the MaTHiSiS ecosystem.
Support Mechanisms for the use cases	<p>Training instructors from Thales will be involved in the MaTHiSiS project (content production and use of the tools).</p> <p>A one day technical meeting planned in April 2016, and a face-to-face meeting between AV, DXT and Thales to define the target group, and the ITC details (between May and July 2016).</p>
Additional Information	NA

Table 35 – THALES AVIONICS

It should be noted that a second important stakeholder is envisaged within the ITC – Airbus, and discussions are currently under progress.

A formal agreement between the MATHiSiS consortium and industrial partners is currently being established (to include an agreement dealing with confidentiality of the data collected to prepare and implement the ITC, and a confidentiality agreement for use with the MATHiSiS project activities and results).

3.5.2 In Spain

3.5.2.1 CENTRO OCUPACIONAL “SAN JUAN DE DIOS”, Valladolid

Organization Name	CENTRO OCUPACIONAL “SAN JUAN DE DIOS”
Contact Details	<p>Noemí SILVA GANSO</p> <p>Avenida de Madrid, nº 68</p> <p>47008 Valladolid</p> <p>+34 983 22 28 75</p>
General Description of	“Centro San Juan de Dios” is a nonprofit organisation, part of the Hospitaller

the Organization	<p>Order of St. John of God. Their objective is the integration of adults with intellectual disabilities, promoting their personal independence, social development and job training.</p> <p>In job training they develop job skills, work readiness and organisation in the workplace. Through individualised programs they enhance personal autonomy, and self-esteem to improve the quality of life for adults with intellectual disabilities.</p> <p>The Centre has expressed a great deal of interest in the tools being developed in the MaTHiSiS project.</p>
Description of the Characteristics of the Services users at that Organization	<p>Main facts about this organisation:</p> <ul style="list-style-type: none"> • The organization deals with more than 200 beneficiaries ranged from 21-50 years old. • The beneficiaries have mainly intellectual disabilities. • Working areas include: <ul style="list-style-type: none"> - industrial laundry, - cleaning, - clothing and footwear recycling, - collecting used vegetable oil.
Support Mechanisms for the use cases	<p>Numbers of participants that will be involved in the project include one professional trainer and five workers.</p> <p>Computers and tablets are available for use during the project.</p> <p>This organisation is interested in the introduction of training through robots but they do not have any available for use.</p>
Additional Information	<p>Higher numbers of workers can be recruited if needed.</p>

Table 36 - CENTRO OCUPACIONAL "SAN JUAN DE DIOS", Valladolid.

3.6 Career Guidance Distance Training Stakeholders (Mapped by EOPPEP and OTE)

3.6.1 TECHNIKI EKPEDEFTIKI S.A.

Organisation Name	TECHNIKI EKPEDEFTIKI S.A.
Contact Details	<p>tel. 30 210 2587387</p> <p>fax. 30 210 2587375</p> <p>info@techniki-ekp.gr</p>
General Description of the Organisation	<p>TECHNIKI EKPEDEFTIKI S.A. is a Long Life Learning Centre founded in 1994 in Athens. Its activities are carried out at a national level, and in addition to work in Athens, enjoys fully equipped training infrastructure in Thessaloniki and Livadia. It is certified by EOPPEP, according to the standard ISO</p>

D2.1 – Formation of stakeholder groups

	9001:2008. Its core business is human resources development.
Description of the Characteristics of the Services users at that Organisation	Target groups are unemployed people, employees, entrepreneurs, professionals, vulnerable groups, public sector personnel, and decision makers.
Support Mechanisms for the use cases	A career consultancy department is available for participants undertaking training courses. Two scientists trained by EOPPEP are permanent staff members of the department. A wide network of external collaborators in the field of career consultancy has also been developed.
Additional Information	TECHNIKI EKPEDEFTIKI (TE) is one of the largest private institutions in the field of Lifelong Learning in Greece. Career guidance is comprised of several projects implemented by TE. Its transnational dimension is strong since TE has participated in, and coordinated, many transnational projects. For more info see: www.techniki-ekp.gr

Table 37 - TECHNIKI EKPEDEFTIKI S.A

3.6.2 The Career Office, University of Piraeus

Organisation Name	Career Office, University of Piraeus
Contact Details	80-82 Zeas str, 5th floor, P.C. 185 34, Piraeus Tel. 210 414 2562, Fax 210 414 2569 Email: gdiasyn@unipi.gr website: http://career.unipi.gr
General Description of the Organisation	The Career Office at the University of Piraeus is: <ul style="list-style-type: none"> • The main contact point for the labour market, employers, industry, etc. • The main contact point for graduates attempting to join the labour market <p>Its Mission is to support students and graduates so that they have successful careers and to achieve a creative coupling between Higher Education and the Labour Market.</p> <p>Its aim is the development of dynamic collaborations between University and the labour market, with benefits for the following communities:</p> <ul style="list-style-type: none"> • for students / graduates • for the academic community • for businesses.
Description of the Characteristics of the Services users at that Organisation	Students and Graduates attending the University of Piraeus. There are eight thousand undergraduate students, and thirteen hundred postgraduate students.
Support Mechanisms	The following staff, equipment and resources will support the scoping of

for the use cases	<p>user requirements and the piloting phases of the project:</p> <ul style="list-style-type: none"> • Three Career Counsellors, one secretary, and one IT consultant. • Five PCs, and five telephones. • Access to data bases with contact details for students, graduates & companies.
Additional Information	<p>The Career Office at the University of Piraeus offers a broad range of services, and enjoys a range of collaborations which will enhance the piloting activities, and broaden the impact of the MaTHiSiS project:</p> <ol style="list-style-type: none"> 1. Preparing Students/ Alumni for Joining the Labour Market by offering: <ul style="list-style-type: none"> • Individual counseling. • Group Counselling: including Job Search Techniques, Curriculum Vitae writing, arranging Job Interviews. • Mock Interviews with executives from the Labour Market. • Vocational guidance tests. 2. Collaborations with the labour market and employment promoters include: <ul style="list-style-type: none"> • With more than 1800 collaborating businesses. • To advertise currently available Jobs/Posts. • A Mentoring Service. • Organising student competitions. • Organising events with the participation of representatives from the Labour Market, on issues related to market developments. • Organising company Visits. 3. Networking Student / Alumni with members of the Labour Market via: <ul style="list-style-type: none"> • Career Days (an annual event involving about sixty companies). • Special events for University graduates and postgraduates. • Maintenance of a database of contact details of current students and graduates. • Cooperation events with other Alumni.

Table 38 - The Career Office, University of Piraeus

3.6.3 OTEAcademy, Athens

Organisation Name	OTEAcademy
Contact Details	<p>CEO: Christodoulos Vakalis</p> <p>Address: Pelika & Spartis 1, Maroussi, 15122, Athens Greece</p> <p>E-mail: c.vakalis@oteacademy.gr, mnikolaidou@oteacademy.gr</p> <p>Telephone : +30210 6114456</p>

D2.1 – Formation of stakeholder groups

	Fax: +30 210 6114833
General Description of the Organisation	<p>OTEAcademy is a private teaching and training company whose main target is to train professionals to enhance their knowledge on current state of the art subjects and practices, and to train high school and University students in Information and Communication Technologies, and other generic fields. It has trained more than fifteen hundred high ranking executives from private businesses and public sector organisations in a range of different countries.</p> <p>The aim is to enhance their students and workers' Project Management and Soft Skills. Our methods of presenting and teaching, which combines OTEAcademy expertise and modern technical infrastructure, enables not only the active participation of the trainees, but also uninterrupted audiovisual communication with the instructor, as well as with the trainees themselves.</p> <p>In addition, OTEAcademy is a registered education provider of Cisco, Project management Institute, Microsoft Office, Alcatel equipment; and is therefore capable of providing the trainees with knowledge about basic operational areas concerning business-economic and engineering activities, and ways in which this knowledge can be integrated into their daily duties within their company.</p>
Description of the Characteristics of the Services users at that Organisation	Trainees and professionals from their early stage of high school education until retirement time - covering the lifecycle of a person's education and working career. There are some trainees with physical impairments, and behavioral disorders.
Support Mechanisms for the use cases	The company has a range of audio visual classes, Interactive Whiteboards, and simulated workplace classes. The company has specialised rooms for certification courses, and also rooms for interactive courses.
Additional Information	NA.

Table 39- OTEAcademy, Athens

4. Methods Involving Stakeholders

The section covers the methods to be used with our stakeholder groups to determine user requirements, define learning goals and associated smart learning atoms, determine the challenges and associated HCI/ergonomic considerations in collecting affect based information from this set of 'extreme users', and steps towards the development of a framework for user acceptance. These methods represent our next steps in working with our stakeholders within Task 2.1 (User Requirements and Learning Goals; M1-M9). The outcomes from this Task will feed into Task 2.2 (System Architecture) in two phases – starting in Month 4 (April 2016) working with Personae to identify early user requirements, and then again in Month 9 (September 2016) where a full mapping of user requirements will ensure that the design of the MaTHiSiS software and hardware architecture is properly adapted to the use cases.

4.1 The use of Personae to elicit early architecture (re) design requirements:

Personae are reliable and realistic representations of our target users in each of our use cases [27]. They are an archetypal representation of real users [2, 28], and not a description of a real or average user.

The personae already developed in this project are based on qualitative and quantitative user research that the MaTHiSiS partnership has already undertaken in previous research (for examples of formation of personae for students with Profound and Multiple Learning Disabilities see [29] and [30]). They offer a quick and inexpensive way to gather and prioritise (re) design features for the MaTHiSiS architecture, and to elicit HCI requirements for the gathering of affect information in the early stages of the project (to M4, April 2016) before working with actual users (M4-M9). They can be used to assess potential design solutions against the needs of a persona and the tasks they are expected to perform [2].

The MaTHiSiS partnership has already created an extensive range of personae to map onto the 5 use cases adopted for this project (Appendix, Section 7). As an example of the important design considerations that can be elicited by considering the personae in the context of the MaTHiSiS project see PMLD personae in 7.1.3 – Sara is vocal but not verbal; or Harry in 7.1.2 has a visual impairment. It is already apparent how these impairments will affect the way in which such users can interact with the MaTHiSiS platform agents, and how careful consideration must be given to the way affect information is gathered. A working party is now being established in WP2 to include all architecture partners to fully consider at a very early stage in the project development how our Use Cases and associated personae will help to redefine the MaTHiSiS system architecture.

4.2 Interview and Thematic Analyses to determine Learning Goals and associated Smart Learning Atoms

Interviews and subsequent thematic analysis is a technique already used by researchers in investigating the potential application of robots in the education of students with Profound and Multiple Learning Disabilities [29]. Each of the key stakeholders identified in section 3 of this report will be interviewed to determine what suitable learning goals are, and associated Smart Learning Atoms for their learners in a range of mainstream, special needs, and vocational training settings. Thematic analysis will then be used to determine the themes and patterns [31] in the data related to learning goals, and the identification of a clear set of reusable Smart Learning Atoms for each Use Case (Months 4-7, April 2016 – July 16).

4.3 User Sensitive Inclusive Design to determine formal user requirements

When the consideration of people with disabilities is included in the design process, it is usual to talk about "Design for all", "Universal Usability", or "Equitable Use", implying that the design should be useful and marketable to any group of users [32, 33]. Other researchers think this harder to achieve [34], and propose a "User Sensitive Inclusive Design" where inclusivity is more achievable than is a universal design. This approach has been particularly recommended for capturing individual differences related to disability, and in particular cognitive dysfunction [34, in 2]

At the heart of this process is understanding and specifying the context of use, and specifying user and organisational requirements, informed by established guidelines on user centred design, e.g. INUSE [35] and USERfit [36-39]. In this way, and via the inclusion of Use Cases focussing on the needs of students with Profound and Multiple Learning disabilities, and those with Autism, as well as neuro-typical learners, a concrete range of needs can be included as requirements in the design of the MaTHiSiS architecture. A user, task and environmental analysis will all contribute to the requirements research concerning the context of use of the MaTHiSiS ecosystem, with teams contributing to the Use Cases considering what user requirements arise out of each Use Case (Months 4-7).

4.4 Focus Groups with Storyboards and Story-telling Narrative to determine user requirements, learning goals and SLAs

Focus groups with our key stakeholders in each Use Case will also be used to elicit user requirements in Months 4-7. Antona et al [2] in reviewing the work of Kitzinger [40] point out the advantage of using focus groups with users with a cognitive impairment in that “ *it does not discriminate against people who cannot read or write and they can encourage participation from people reluctant to be interviewed on their own or who feel they have nothing to say*”. They also suggest the use of materials for review which will help in the elicitation of such requirements, and in the MaTHiSiS project we will use storyboards and storytelling narratives (already produced by the partnership) to serve this process.

It is also an aim of the MaTHiSiS project to scope learning goals and associated SLAs in collaboration with learners themselves. In contrast to interviews with teachers and educators and using thematic analyses to identify learning goals and associated SLAs in a systematic way, focus groups will be used with learners themselves, especially suited to those with a cognitive impairment to achieve this aim. To help users with a range of impairments and capabilities envisage the learning opportunities that the MaTHiSiS ecosystem and associated platform agents will afford them, generative toolkits will be used. Sanders and Stappers [41] explain generative toolkits as offering “*a participatory design language that can be used by non-designers so they can express their own ideas*”. These toolkits will be developed in month 4 of the project and used in months 5-7 in focus groups, to create a shared design language between project partners and the learners the project addresses, and allow participation on an ‘equal footing’.

4.5 Early Trials with Platform Agents and Algorithms to Assess the Challenges and HCI implications in collecting Affect Information from ‘Extreme Users’

With the MaTHiSiS project different modes of data will be collected and analysed to determine the affective state of the user. The modes of data chosen will depend on each user’s physical and sensory capabilities, and the selection of users within the Use Cases represent a set of ‘extreme users’. It will be challenging to collect affect information from these users whilst maintaining low levels of intrusion. For example, consider a user who cannot express him/herself verbally (see Personae ‘Harry’ in 7.1.2 for example), then his/her data will be collected via eye-gaze and body movement (although Harry’s physical skills are deteriorating over time). MaTHiSiS will follow a multimodal

approach in fusing the data obtained from different modalities. This task will focus on the feasibility of collecting sensor based information from a set of ‘extreme users’ from available platform agents (e.g., the NAO robot) and investigating whether we can use currently existing algorithms to determine level of engagement and attention, and the early implications (as a set of ‘affect-based’ user requirements) for the MaTHiSiS architecture.

Recent literature discusses methods for analysing multimodal data to detect the affective state of users from image, eye gaze, and different types of sensor data [42, 43]; and to analyse multimodal sensor data obtained from complex movements in order to improve the task of activity and gesture recognition [44, 45 and 46]. Once the multimodal data is fused, machine learning approaches can be applied to create a decision support system capable of making inferences related to learner’s engagement and context-dependent, personalised performance metrics. The Decision Support System will perform cutting-edge learning analytics [47] and will utilise neuro-evolutionary methods [48] and neural-fuzzy techniques [49], which have already been tested in learning environments.

Trials will work with small groups of participants within each Use Case to determine the challenges in collecting affect-based information from each of the three platform agents (NAO, Interactive Whiteboard and Mobile devices). Observational field notes will be recorded to identify any difficulties. For example when working with the NAO robot users with profound and multiple disabilities will have affect information determined via gaze and gesture information extracted from the video signal, and audio information will be collected via the robot’s microphone for audio sentiment analysis. It is clear from considering the personae presented in annex 7.1 that these ‘extreme users’ may face challenges within these human-robotic interactions in maintaining eye gaze, producing clear natural speech, and performing consistently clear gestures. This task will analyse these early challenges, and their implications for the MaTHiSiS architecture.

4.6 Workshops with Stakeholders to develop a Framework for User Acceptance

System acceptability to learners in each of the Use Cases will be determined by forming a Framework covering the psychology of the users, the design process, and the quality of the technology in user terms [50]. In the early stages of the project (M4-9) this Framework will be informed by methods including Workshops with the stakeholders identified in sections 3.2-3.6. Barriers to the adoption of the MaTHiSiS ecosystem will also be explored within these workshops, borrowing from an approach furthered by Standen and Burton [51] providing trainers with a blue print on how to optimally use innovative new learning technologies in new contexts. This type of framework will provide both questions and directives in four dimensions (social, educational, technological and organisational), and is influenced by the research of Minocha [52].

4.7 Integration of working methods

Within months 7-9 (July-September, 2016) the findings from the use of personae, interviews and subsequent thematic analyses, user sensitive inclusive design, focus groups, early trials with platform agents, and workshops will be synthesised in a MaTHiSiS working party meeting. Implications for user requirements, the challenges in collecting affect-based information whilst maintaining low levels of intrusion and incumbent HCI principles, learning goals and smart learning atoms, and an agreed framework for user acceptance will be drawn. These implications will feed a number of other work packages and tasks within the MaTHiSiS project.

5. Conclusion

The formation of stakeholder groups has now been achieved, and these have been aligned to each of the five Use Cases selected to ensure that the MaTHiSiS System Architecture is suitable for a diverse set of learners (in terms of their cognitive, sensory and physical capabilities) operating in a diverse set of contexts. This range of users has been selected based on criteria (including the need for improved vocational training, personalised learning, better representation of people with disabilities in the workforce and in lifelong learning, and the further integration of people with disabilities in society), and goes a long way in addressing universal access in scoping user requirements. As a group these users can be seen to represent an 'extreme' set, and the inclusion of these cases in scoping user requirements has distinct advantages. When designing well for the extreme, we design inclusively for all [5].

Methods of working with these stakeholders have been defined to elicit user requirements - and hence help to (re) configure the existing MaTHiSiS architecture, determine appropriate learning goals and SLAs for learners in each of our Use Cases, and to assess the challenges in gathering affect-based information from such a diverse set of learners. These include the use of personae, interviews and subsequent thematic analyses, user sensitive inclusive design, focus groups, early trials with platform agents, and workshops.

This deliverable will formally feed into the following tasks:

Task 2.2: Design of software and hardware architecture – To elicit system requirements and design the software and hardware architecture of MaTHiSiS, to ensure proper adaptations to the use cases.

Task 2.3: Evaluation Planning - Prepares the phased evaluation strategy related to both neuro-typical learners, and learners with special educational needs.

Task 3.1: Input for educational content development – Defines the SLAs for both neuro-typical learners, and learners with special educational needs.

Task 4.1: MaTHiSiS sensorial component - Driven by the user requirements arising from research with the stakeholders identified in this deliverable, and will conclude with details on the affect sensors that will be used by the MaTHiSiS platform agents. Various criteria will be taken into account, driven by the cognitive, physical and sensory capabilities and impairments of our learners identified in the five Use Cases, and should be as non-obtrusive as possible.

Tasks 8.1-8.3: ASC, PMLDC, and MEC, and Tasks 9.1 & 9.2: ITC and CGDLC - Test the MaTHiSiS ecosystem in the context of learners with Autism, Profound and Multiple Learning Disabilities, in Mainstream Education, in Industry, and those involved in Career Guidance.

Finally it should be noted that the formation of the MaTHiSiS Stakeholders is an ongoing activity, and the current extant mapping represents a snapshot of achievements at a very early stage in the project (three months). As the project matures further stakeholders will be added to each of the Use Cases to add value to scoping user requirements and learning goals, and in our piloting activities.

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7. Annexes

7.1 PMLD Personae

7.1.1 JCYL PMLD Personae

Physical, visual and intellectual disability.
Meet Sam
<p>Background: Sam is 17 years old His parents are separated and are in conflict, and he is aware of this.</p> <p>He is sociable and likes to know everything (a bit of a gossip), is slow in performing work, and gets tired very quickly.</p> <p>Currently he is very interested in girls and has been obsessed with the idea of being one of his teacher's boyfriends.</p> <p>He has multiple disabilities (visual, physical and cognitive). He is a wheelchair user, which he can control himself, but in a very slow way.</p>
<p>Learning needs</p> <ul style="list-style-type: none"> - Improving his social skills - Sexual education in order to understand the changes he is experiencing - Developing daily living skills with autonomy (a major challenge for Sam) <p>Capabilities</p> <ul style="list-style-type: none"> - Sam retains information he receives by hearing. - Sam has very good hearing skills. - He is very sociable, and enjoys being with other people. - He is able to read simple texts.
<p>Possible learning scenario</p> <p>Sam's learning scenario will be determined further by working with the PMLD stakeholders in his area. His learning needs are complex due to his complex and profound learning and sensory impairments.</p>
<p>Technology use</p> <p>Sam has experience of using a range of technologies, especially his laptop that he uses for reading and writing tasks, which he uses with a range of assistive technologies.</p>
<p>Challenges</p> <p>Sam has poor muscle tone, and motor skills disabilities. He cannot click his fingers, or handle scissors, use a brush, or pick up a pencil. He needs visual adaptations (extend images or texts...) He experiences difficulties in using smart boards, as a result of his fine motor skills issues.</p>
<p>Learning style/likes and dislikes</p> <p>Sam needs constant attention to maintain his motivation and engagement. He is really interested in other people around him. Sam likes football. Sam learns well via social reinforcement (such as a smile or 'thumbs up' when he gets things right).</p>

Table 40 - JCYL PMLD Personae

7.1.2 RIX PMLD Personae

Complex communication and health needs
Meet Harry
<p>Background Harry is 17 years old.</p> <p>Harry is a young man with complex communication and health needs. He is visually impaired. Harry has complex mobility needs and uses wheelchair. Harry's communication is complex and difficult to understand. He uses Alternative and Augmentative Communication (AAC) devices: a Dynavox - using switch and auditory scanning. Harry has his own signs and vocalisations for 'yes' and 'no'. Harry's physical skills are deteriorating and alternative means of communication are being explored e.g. using iPad with auditory scanning options and 1:1 staff support.</p> <p>Harry has a RIX Wiki which provides a good overview of his skills, abilities and needs.</p>
<p>Learning needs</p> <ul style="list-style-type: none"> - Developing independent living and self-advocacy skills.
<p>Capabilities</p> <ul style="list-style-type: none"> - Harry is very sociable young man, with a good sense of humour, who enjoys company and interaction with other people. Music, and in particular reggae and rude noises are great motivators for Harry.
<p>Possible learning scenario</p> <p>Harry would like to learn to use his Dynavox, and other technology to text his brother or friends.</p>
<p>Technology use</p> <p>Harry uses a Dynavox, various switches, and an iPad with auditory scanning with support from staff.</p>
<p>Challenges</p> <p>Harry's physical skills are deteriorating and physical actions prove to be more and more difficult for Harry. Auditory scanning and iPad use are being explored as possible alternative communication options.</p>
<p>Learning style/likes and dislikes</p> <p>Harry likes interacting with other people, bowling, staying in control, and music. Harry dislikes noise, especially sudden loud sounds.</p>

Table 41 - RIX PMLD Personae

7.1.3 UoN PMLD Personae

Physical challenge and complex ID
Meet Sara
<p>Background Sara is seven years old and lives with her parents and three non-disabled siblings in Nottingham. She attends Oak Field non-residential school where she has been since she was four. Due to oxygen deprivation at birth she has cerebral palsy and global developmental delay. She uses a wheelchair at all times and depends on others to move around. She is vocal but not verbal and has little understanding of words relying more on other cues such as gestures and tone of voice.</p>
<p>Learning needs Sara needs to acquire a basic understanding of cause and effect and turn taking before she can progress to improving her communication with others.</p>
<p>Possible learning scenario One way to do this would be to use a conditioning paradigm and</p>

reward, e.g. an utterance/vocalisation and eventually a switch closure with the robot playing a favourite piece of music.
Technology use Sara has had no experience of using any technology but has observed her siblings and other pupils using mobile technology and laptops. Teachers also want to teach her use of a basic switch so that she can better communicate her needs and do more for herself. She has been encouraged to do this by having her hand placed on a switch and pressed down to activate it but will not currently do this herself.
Challenges Sara has low muscle tone, poor control of her trunk and limbs, and finds it difficult to control her head so that she can maintain a continuous gaze on what is in front of her.
Learning style/likes and dislikes She likes working in a group when she can become quite noisy in order to make sure she gains attention. She likes music and has a good sense of rhythm.

Table 42 - UoN PMLD Personae

ID and autism
Meet Mohammad
Background Mohammad is twelve years old and has only just joined this school as his family has recently moved to the area. He has Autistic spectrum disorder with severe ID and hearing loss with a short attention span. He does not speak but uses Makaton sign language having learnt quite a few new signs in the four months he has been at this school. He is mobile and liable to run away seemingly without warning. He exhibits challenging behaviour and a preference for solitary play. He has no awareness of danger.
Learning needs Staff want him to improve his communication and increase his attention span. The speech and language therapist believes he could learn a few single word utterances as well as increasing his use of augmentative communication through symbols and signs.
Possible learning scenario Mohammad could use a game on a mobile device or signal signs to the robot to either do the action or say the word.
Technology use He has good fine and gross motor development, and can use a tablet if it is held for him.
Challenges Mohammad has hearing loss and inconsistent eye contact, short attention span and a tendency to get distracted by a particular feature of the technical device with which he is working even though it may be irrelevant.
Learning style/likes and dislikes He likes technology and Lego, but is quick to break and dismantle things. Because of his distractibility, he is better in an uncluttered environment. He also prefers to work on his own with his favourite teaching assistant.

Table 43 - ID and autism personae

Severe ID with other challenges
Meet Katje
Background Katje is 16 years old and has Down's syndrome, severe ID, and global developmental delay. She is mobile with good postural control and reasonable fine motor control (can pick up pencils). Katje has difficulty in communicating or understanding directions, poor spatial judgement, and is slow at information processing. She takes a long

time to socialise and get used to people.
Learning needs Katje's learning needs include understanding right and left and communicating this to others. Because of slow information processing she needs to have tasks (such as learning numbers) broken down into very simple steps, with plenty of encouragement and guaranteed success.
Possible learning scenario Direct a robot round a maze. Play collaborative games on mobile devices.
Technology use Katje has played simple games on a desktop computer with a great deal of help from her teaching assistant.
Challenges Katje experiences slow information processing, and cannot handle a choice of between more than two options. She has no real interest in the technology she has been already shown in her school.
Learning style/likes and dislikes She loves puzzles, drawing and painting, and is good on colours. Teachers feel she would benefit from learning with a peer but currently learns better on her own.

Table 44 - Severe ID with other challenges Personae

Profound and Multiple Learning Disabilities
Meet Adele
Background Adele is 8 years old, non-verbal and uses her voice mainly to laugh or scream. She can move around independently on her knees but cannot walk. She plays with plastic baby toys, chewing them repetitively. She will occasionally point towards something she wants and vocalises for attention. Otherwise she will move towards anything that she wants to pick up and generally put it straight in her mouth.
Learning needs Adele needs to use her hands functionally, currently one is always holding the item she is chewing and the other remains inactive by her side. She needs to develop her communication, possibly by responding to objects or symbols to make choices.
Possible learning scenario Use her hand(s) to gesture in order to make the robot sing.
Technology use When adults have held devices in front of her she reaches out to take it and pull it from the adult.
Challenges Very restrictive use of hand movement and apparent disinterest in engaging with anyone else.
Learning style/likes and dislikes Likes music and will sometimes pause to watch another person in the environment.

Table 45 - Profound and Multiple Learning Disabilities Personae

7.1.4 PMLD Personae from Europole

Conduct and emotional disorder outcome from cerebral palsy
Meet Thomas
Background Thomas is 12 years old and he is an only child. He attends the first year of secondary education, with the help of an assistant teacher and an educator. Owing to perinatal issues, he has a cerebral palsy with mild developmental delay and difficulties in the relationship with his peers. Thomas can understand spoken language, but his speech is not fluent and with a fast rhythm. He has fine and gross motor difficulties and finds writing difficult because of the lack of eye-hand coordination. He has a short attention span, and

weak self-control. He often needs help to sequence his tasks correctly.
Learning needs Thomas has adequate communication skills but he needs to learn how to slow down, to control his gestures, and to plan his activities.
Possible learning scenario Programming a sequence of actions that the robot should do and recognise that they have an order (planning activities), using a tablet to develop his fine and gross motor skills, and to develop fluent speech.
Technology use Thomas' parents use a computer to show him documentaries and other videos, but he is not able to use it on his own.
Challenges besides his lack of fine motor control, and his short attention span, Thomas experiences nervous tics in stressful situations.
Learning style/likes and dislikes Thomas is curious, he likes history and documentaries about nature and geography. He likes working in groups and he prefers to play simple games with younger children.

Table 46 - Conduct and emotional disorder outcome from cerebral palsy Personae

Tetraparesis and moderate-to-severe ID
Meet Andrea
<p>Background Andrea is 19 years old he is an only child and he lives with his parents. He attends the sixth year of secondary education, with the help of an assistant teacher and an educator for the majority of the school time.</p> <p>He has tetraparesis as a result of his cerebral palsy, and moderate-to-severe ID. He uses a wheelchair at all times and depends on others to move around. He uses his right hand to hold pens and objects. He has little movement in his left hand and problems with his fine motor skills.</p> <p>He has a limited vocabulary, but can produce short sentences linked to his practical and daily experiences. His attention span is quite short.</p>
Learning needs Activities to improve his attention skills, and to increase his inter-personal skills and manners.
Possible learning scenario He can use games on his computer, starting from a single image the context could be enriched in response to his questions. If his responses are slow then clues will appear (to improve his vocabulary).
Technology use Andrea uses a touch screen computer and has his own Facebook profile.
Challenges Andrea has a quite short attention span and he is not used to starting activities without the help of an adult.
Learning style/likes and dislikes Andrea is well integrated in his class, he likes working with

his other peers, and he is interested in social relations. He loves soccer.

Table 47 - Tetraparesis and moderate-to-Severe ID Personae

Cerebral palsy and moderate-to-severe ID
Meet Marco
<p>Background Marco is 16 years old and he attends the second year of secondary education, with the help of an assistant teacher and an educator for the majority of his school time. He has a moderate-to-severe ID and he has cerebral palsy. He can walk but in a stiff way, and has poor gross and fine motor skills. He has limited vocabulary, and can pronounce a few sentences (which are often repeated). He can communicate his needs.</p> <p>He is interested in meeting other people, but when someone talks to him, he often doesn't answer, instead grabbing the speaker's arm and tightening it until it hurts.</p>
<p>Learning needs to improve his capacity to answer direct questions (at least with "yes" or "no").</p>
<p>Possible learning scenario The robot could ask Marco what he wants it to do (e.g. "do you want me to dance?") to encourage him to make a choice.</p>
<p>Technology use Marco doesn't currently use any technology.</p>
<p>Challenges Marco sometimes demonstrates challenging behaviour, and this can make it difficult to work with him.</p>
<p>Learning style/likes and dislikes Marco likes music and singing.</p>

Table 48 - Cerebral palsy and Moderate-to-Severe ID Personae

7.2 ASC Personae

7.2.1 JCYL ASC Personae

Autism spectrum case
Meet Ángel
<p>Background Angel is 10 years old.</p> <p>He has just started using functional oral language, even though he still screams for attention. He stands up all the time and walk around the classroom. He exhibits many stereotypic movements - usually grabbing his ears and flapping his hands.</p> <p>He likes a regular routine and does not tolerate changes in routines very well.</p> <p>Sometimes he is "aggressive", and he is obsessed with another pupil that also cries, and screams, and to whom he get close to in order to hit her.</p> <p>His teacher is his reference, and acts as an "intermediary" between him and the rest of the</p>

<p>world.</p> <p>Angel is obese due to his bad eating habits that his family cannot control. He has no awareness of danger.</p>
<p>Learning needs</p> <p>To improve his functional oral language.</p> <p>To develop his social skills.</p> <p>To learn to control his “tantrums” (he uses aggressive behaviour to get what he wants).</p> <p>To learn to eat healthier.</p>
<p>Capabilities</p> <p>He is good at imitating people.</p> <p>He is very observant.</p> <p>He is a fast learner of things that interest him.</p> <p>He is good at asking for help when he needs something, but will use his own strategies to get things himself.</p>
<p>Possible learning scenario</p> <p>His teacher thinks he would love using a robot to learn things.</p>
<p>Technology use He has good fine and gross motor skills, and can use a mobile, and tablet. He often uses smart boards.</p>
<p>Challenges</p> <p>He displays disruptive behaviours.</p> <p>Sometimes it is difficult to understand his speech.</p> <p>With unknown people he will often try to run away from the classroom.</p> <p>He is stubborn.</p> <p>He is very obsessed about routine.</p>
<p>Learning style/likes and dislikes</p> <p>He likes technology and Lego or other building games.</p> <p>He loves Peppa Pig, Disney characters, shopping centres, cars, Donny Brook, and music.</p>

Table 49 - Autism spectrum case Personae

7.2.2 FMD ASC Personae

<p>Autism spectrum case</p>
<p>Meet Mohammad</p>
<p>Background Mohammad is twelve years old and has only just joined this school as his family has only recently moved to the area. He has Autistic spectrum disorder with severe ID and hearing loss with a short attention span. He does not speak but uses Makaton sign language having learnt quite a few new signs in the four months he has been at this school. Mobile and liable to run away seemingly without warning. Has violent tendencies and a preference for solitary play. He has no awareness of danger.</p>
<p>Learning needs Staff want him to improve his communication and increase his attention span. The speech therapist believes he could learn a few single word utterances but could</p>

increase his use of sign language both pictorial and signed.
Possible learning scenario could use game on mobile device or signalling signs to the robot to either do the action or say the word.
Technology use Good fine and gross motor development and can use a tablet if it is held for him.
Challenges Hearing loss and inconsistent eye contact, short attention span and tendency to get distracted by a particular feature of the technical device with which he is working even though it may be irrelevant.
Learning style/likes and dislikes Likes technology and Lego but is quick to break and dismantle things. Because of short attention span, he is better in an uncluttered environment. Also prefers to work on his own with his favourite teaching assistant.

Table 50 - Autism spectrum case Personae

7.2.3 UoN ASC Personae

Severe Learning Difficulties and Autism
Meet Jake
Background Jake is 12 years old and attends a special school for students with autism. At school his preferred activity is flicking water from the tap or repetitively running his fingers through sand or other small substances. He does not speak but will try to make his needs known through vocalisations and gestures. He is physically active, strong and can push staff away or try to hit them in order to be left alone. He usually resists any attempts to bring him into a class activity.
Learning needs To be able to point to indicate a choice. He will select a symbol from a small choice when prompted but needs to develop independence. He also needs to learn to follow an adult choice of activity.
Possible learning scenario Use an iPad to complete some structured tasks requiring him to develop hand and finger control.
Technology use has used a laptop but without apparent purpose or direction.
Challenges Jake resists the efforts of staff to engage him or demonstrate how he can do things.
Learning style/likes and dislikes Jake appears to just want to be alone and in control of how he spends his time. Occasionally he likes to look at a book.

Table 51 - Severe Learning Difficulties and Autism Personae

ID and Autism
Meet Archie
Background Archie is 11 years old and attends a special school for children with autism. He is non-verbal, shows little variation of facial expression and has no communication system, carergivers have to recognise body language to anticipate needs. He is generally very passive, will allow himself to be lead around the school but takes very little active part in activities. When alone he will rock in his chair, tap the table, and make repetitive sounds.
Learning needs Archie needs to develop a means of communication so that teachers can begin to find ways to work with him. He resists looking at books and shows little interest in any materials.
Possible learning scenario Use the NAO robot programmed to respond to certain actions and sounds to encourage Archie to initiate.
Technology use Has been shown cause and effect games on the iPad and will show some interest when physically guided to engage in them.
Challenges Archie's level of passivity and inaction. He does not appear to have functional use of his hands beyond repetitive tapping.
Learning style/likes and dislikes Archie really enjoys music and singing. He will respond to an adult when they engage physically with him, taking his hands to be guided through gestures accompanying songs.

Table 52 - ID and Autism Personae

7.2.4 ASC Personae from Europe

High functional autistic spectrum disorder
Meet Susanna

<p>Background Susanna is 11 years old, she attends the first year of secondary education, with the help of an assistant teacher and an educator for the majority of the school time. In September she started a new class at school and, as in all previous times she encounters a new environment or situation, this caused the worsening of some behaviours (e.g. she will run away from the classroom without any warning signs). Susanna talks a lot and she likes to play with her peers in one-to-one relationships.</p>
<p>Learning needs Since she is curious (in her own peculiar way) about the others, she needs to improve her capacity to tolerate the frustrations in her relationships.</p>
<p>Possible learning scenario Playing games in which she has to respect given rules (not her own) and wait for her turn.</p>
<p>Learning needs To improve her social skills.</p>
<p>Possible learning scenario Use cartoons to create a story in the importance of being in group are highlighted; and where each image she selects will lead to different outcomes.</p>
<p>Technology use She plays videogames on her tablet.</p>
<p>Challenges Susanna can suddenly act in aggressive and violent way when she doesn't reach her goals. She also has a short attention span.</p>
<p>Learning style/likes and dislikes Susanna is very creative, spends a lot of time drawing, painting, cutting, pasting,...where she can use her imagination.</p>

Table 53 - High functional autistic spectrum disorder Personae

7.3 MEC Personae

7.3.1 NTU MEC Personae

<p>Mainstream High ability Pupil</p>
<p>Meet Sam</p>
<p>Background Sam is an eleven year old boy who is in his first year at secondary school, having been to a mainstream primary school since he was four years old.</p>
<p>Learning needs Sam has a high level of cognitive ability and has always been in the top 5% of his class. Sam needs to be challenged in class otherwise he can become bored, disengaged with learning and has the potential to be disruptive.</p>
<p>Possible learning scenario Sam needs to be set high expectations. He is used to working on his own and needs to be encouraged to work collaboratively.</p>
<p>Technology use Sam has used a range of technology in his primary school: tablets, PCs, IWB, and Interactive TV. He has created games in primary school using Scratch and is used to online quizzes for tests of knowledge development and for homework. He is confident in using two programming languages, but needs to take these to higher levels in his secondary school computing lessons. He uses the school's Virtual Learning Environment for in class and out of class work and will use email to ask his teachers for help when needed.</p>
<p>Challenges The key challenge for Sam is to encourage him to develop his work to higher levels. He responds well to high expectations, and can become disruptive if not sufficiently challenged in the level of tasks set.</p>

Learning style/likes and dislikes Sam dislikes working with children he considers are working at a lower level. He has no patience with helping others to achieve. He enjoys having clearly defined tasks that enable him to problem-solve and work on his own. He particularly responds well to case study type activities. He is much happier working on his own.

Table 54 - Mainstream High ability Pupil Personae

Mainstream Low ability Pupil with English as a second language
Meet Yasmin
Background Yasmin is 13 years old in her third year at secondary school. She has been in mainstream education since she arrived in England from Croatia when her family moved here when she was 10 years old. Her family speak Croatian at home. She has found learning English difficult and still struggles with some aspects of the language. She has a teaching assistant to support her in English and maths lessons. Yasmin is identified as a Pupil Premium and lives in a home where neither parent works.
Learning needs Yasmin wants to please and will try hard in class. She is happiest when she is able to use translation software in class and makes most progress when using a tablet with access to this software. Some teachers provide structured resources for Yasmin which have key words for her to learn and are partly in English, and partly in Croatian to help her to access the materials and support her development of the English language.
Possible learning scenario Yasmin prefers to work in a group. She can lack confidence in her own ability and does need to be encouraged to contribute in group situations. She works well on her own but doesn't always ask for help which can limit her progress.
Technology use Yasmin only has access to technology when at school. Her family are not able to afford a mobile phone for Yasmin. She is encouraged to attend after-school clubs where she can access technologies for homework, however Yasmin needs to be reminded to attend these clubs.
Challenges It is important to monitor Yasmin's progress in class carefully and ensure she stays on task and completes work set. She can respond well to being challenged to achieve higher levels and needs her confidence building.
Learning style/likes and dislikes Yasmin likes working with her friends who mainly come from other countries with English as their second language. She will work on her own and needs to be encouraged to ask for help. She works most effectively when she has a teaching assistant with her. She enjoys using technologies in learning but does not always remember how to use the technologies and needs prompt sheets.

Table 55 - Mainstream Low ability Pupil with English as a second language Personae

7.3.2 IMOTEC MEC Personae

Neuro-typical mainstream education student
Meet Jonas
Background Jonas studies in the 7 th grade in the secondary school in Klaipeda. He has some previously learnt knowledge on how to use computer-based simulations (PhET Interactive Simulations [53], embedded in Internet search engines (e.g., Internet Explorer or

Mozilla Firefox). Jonas doesn't know how to use the Yenka Modelling Software [54]package – having previously only worked with digital simulations.

Jonas also has some theoretical knowledge of “Acid rain” from his chemistry lessons, such as knowledge that the majority of fossil fuels contain impurities - sulphur. Most power stations burn fossil fuels. Burning fossil fuels, leads to the formation of sulphur dioxide gas. Sulphur dioxide gas is trapped in the atmosphere, dissolves in rainwater and combines with oxygen in the air. The result is acid rain. Brick and metal buildings are corroded by acid rain.

Learning needs Jonas needs to learn:

- How to open, use, save and close modelling software.
- To model a range of causes, effects and solutions (e.g., of acid rain).
- To describe the full modelling process.

Possible learning scenarios

Interpretation, discussion, group work, workshops, individual work, demonstrations of new materials, including:

1. Didactic /demonstrations - to provide basic knowledge.
2. Experimental work/workshops using the Yenka Software package.
3. Discussion - to sum up the achieved results.
4. Demonstration /presentations - to define the correct modelling of chemical reactions.
5. Presentation and description of the model with causes, effects and solutions.

Jonas participates in informatics lessons to enable him to use software properly. He participates well in tasks during his chemistry lessons. He does experimental work using the Yenka Software package, and participates in discussions. He acts as a leader in the discussion group. He is the delegated person to present conclusions from the group work back to his class.

Technology use includes:

- <https://phet.colorado.edu/en/simulations/category/new> and <http://software.informer.com/search/Yenka> - a new generation of educational modeling tools from Crocodile Clips. This program enables students to experiment in a virtual environment with topics including electronics, mathematics, geometry, statistics, programming, chemistry and electricity.

This programme is downloaded on every PC in the classroom. Every child has access to a PC for the practical chemistry lesson. IWBs are used to demonstrate new learning material and examples of each experiment.

Jonas has good skills in using his PC. He doesn't have any particular problems in using the Software package. Jonas is enthusiastic about using the MaTHiSiS platform because he would like to apply his skills in using different platform agents (robots, mobile devices, IWBs).

Challenges

- Integration of the curriculum from different subject areas - informatics and mathematics, chemistry and physics.
- Providing students with clear instructions in order to make progress in their learning

tasks.
<ul style="list-style-type: none"> Can other input methods be used to gather information on the affective state of learners (e.g. exercises with questions answered by the students)?
<p>Learning style/likes and dislikes</p> <p>Jonas prefers to learn individually, but also likes team work. He is an auditory learner, and prefers to learn by hearing and listening. He is good at following spoken instructions.</p>

Table 56 - Neuro-typical mainstream education student Personae

7.4 Industrial Training personae

7.4.1 Aerospace Valley ITC Personae

Neuro-typical technical assistant
<p>Meet Bill</p> <p>Background</p> <ul style="list-style-type: none"> Bill is 35 years old. He is a technical assistant on the factory line at COMPANYX He holds a technical degree from a vocational school
<p>Learning needs</p> <ul style="list-style-type: none"> The goal of the training session is for Bill to better understand and evaluate the risks associated with electrostatics, in order for him to take these risks into consideration in his day-to-day working life.
<p>Possible learning scenario</p> <ul style="list-style-type: none"> <u>Option 1</u>: training session held in a classroom, taught collectively <u>Option 2</u>: remote training session, collective material but accessible individually
<p>Technology use</p> <ul style="list-style-type: none"> Bill makes little use of technology while at work, as this is not required in the different tasks he performs. Bill has extensive leisure-time experience of technology, and feels comfortable using most innovative technology products as long as they remain user-friendly.
<p>Challenges</p> <p>Bill needs to remain focused throughout the duration of the training session, and see it as a pleasant experience rather than a 'duty'.</p> <ul style="list-style-type: none"> Bill needs to understand the importance of his training sessions, i.e. to understand the overall meaning and purpose of the information he is given. He needs to find the material useful, and be able to reuse what he has learned later on.
<p>Learning style/likes and dislikes</p> <ul style="list-style-type: none"> Bill is used to team work, as he works in a team on the factory line. Bill does not respond well to displays of authority and hierarchy. Bill responds better to educational methods that rely on concrete examples and 'hand-on' exercises.

Table 57 - Neuro-typical technical assistant Personae

Neuro-typical Customer
Meet Brenda Background <ul style="list-style-type: none"> • Brenda is 40 years old. • She is in charge of the installation and maintenance of products delivered by COMPANYX • She holds an Engineering Degree
Learning needs <ul style="list-style-type: none"> • Brenda needs to learn how to install, use and maintain the products her company buys at COMPANYX, which require proper training.
Possible learning scenario <ul style="list-style-type: none"> • <u>Option 1</u>: on-site training sessions, organised upon delivery of the product; • <u>Option 2</u>: remote training sessions, delivered later on (and accessible on-demand, in the form of a helpdesk)
Technology use <ul style="list-style-type: none"> • Brenda is proficient with technology, and uses technology on a day-to-day basis. She has an extensive knowledge of technological products. • Brenda has never, however, used an innovative training solution such as MaTHiSiS and is skeptical about its possibilities.
Challenges <ul style="list-style-type: none"> • To improve the quality and efficiency of clients' training sessions; • To provide clients with clear instructions in order to avoid having to re-intervene after product delivery; • To improve customer relations and maintain the links between COMPANYX and its customers.
Learning style/likes and dislikes <ul style="list-style-type: none"> • Brenda prefers to learn in face-to-face situations, without group pressure. She also prefers human contact to computerised interactions. • Brenda tends to be forgetful without acknowledging this. She needs to be reminded of things several times, to be able to learn in her own time, as well as to gain feedback on her progress.

Table 58 - Neuro-typical Customer Personae

7.5 Career Guidance personae

7.5.1 EOPPEP Career Guidance Personae

Neuro-typical student receiving career guidance
Meet Alexandros
<p>Background Alexandros studies in the second grade of a Greek General Lyceum. He is about to choose one of the three “orientation groups” (omades prosanatolismou) he will follow in the last grade (3rd grade) of Lyceum. This choice is strongly connected with the profession he is going to follow in the future, since, according to the current system of accessing tertiary education, every orientation group is connected with certain scientific fields that contain specific tertiary education or superior education schools.</p>
<p>Learning needs Alexandros is about to take an important career decision, that will affect both his education course and his career development in general. To make the best decision he must:</p> <ol style="list-style-type: none"> 1. Know as much as possible about the characteristics and traits of his own personality (cognitive abilities, interests, values, motives, career aims etc.) as well as his general needs (social, economic etc.) and self-esteem. 2. Receive training to be able to search for up to date information concerning the current labour market situation (supply and demand of professions etc.), since choosing a specific education course will affect the professional sectors he will work in.
<p>Possible learning scenario Alexandros needs professional support from a trained career guidance counsellor which will make an initial assessment of his informational needs, before specific techniques and resources are used to provide relevant information. A welcome interview is arranged with the counsellor for this reason during which the counsellor will use several techniques (e.g. narrative technique etc.) and encourage Alexandros to talk about himself and his qualifications.</p> <p>From this first conversation the counsellor has the impression that Alexandros is confused about the profession he wants to choose, because of his low self-awareness and low self-esteem. For this reason the counsellor chooses to assign to Alexandros the “Self-Awareness – Career Decision Making” Learning Graph</p> <p>This learning Graph comprises of 2 learning goals: Self-Awareness and Career Decision Making.</p>
<p>Technology use The counsellor can support Alexandros in his duties or any time he faces a technical difficulty with the MaTHiSiS platform, or EOPPEP’s tools connected with MaTHiSiS platform. For this reason a second persona (that of a counsellor trained in the use of MaTHiSiS platform will be developed).</p>
<p>Challenges Whether other methods are available to gather information on the affective state of the learners is possible (e.g. exercises with questions answered by clients).</p>
<p>Learning style/likes and dislikes the case of Alexandros is a common case of students who need to take a career decision before choosing which “orientation group” (omada prosanatolismou) to follow. Depending on the case of each particular student, and the initial assessment of his needs by the counsellor, the MaTHiSiS platform will deploy different learning actions in each instance.</p>

Table 59 - Neuro-typical student receiving career guidance Personae