

## Managing Affective-learning THrough Intelligent atoms and Smart Interactions

### D9.5 Report on Career Guidance Distance Learning pilots

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## List of Acronyms

Abbreviation / acronym	Description
CERTH	Centre for Research and Technology Hellas
CGDL	Career Guidance Distance Learning
CMS	Career Management Skills
CV	Curriculum Vitae
ELGPN	European Lifelong Guidance Policy Network
EOPPEP	National Organisation for the Certification of Qualifications and Vocational Guidance
HAEC	Hellenic American College
HD	High definition
ID	Intellectual Disability
KDVM	Life Long Learning Centers (Kentra Dia Viou MaTHiSiS)
LG	Learning Goal
LM	Learning Material
M	Month
PA	Platform Agent
PC	Personal Computer
SC	Sensorial Component
SLA	Smart Learning Atom
WP	Work Package

**Table 1: Definitions, Acronyms and Abbreviations**

## Project Description

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The MaTHiSiS learning vision is to provide a novel advanced digital ecosystem for vocational training, and special needs and mainstream education for individuals with an intellectual disability (ID), autism and neuro-typical learners in school-based and adult education learning contexts. 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 Objectives 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 Objectives that will constitute the vertices of these graphs, while relations between SLAs and Learning Objectives constitute the edges of the graphs. SLAs are atomic and complete pieces of knowledge [1] that 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 Objectives 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

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This deliverable reports the assisted pilot phase of the MaTHiSiS Career Guidance Distance Learning case (CGDL). During this phase, the assisted pilots that validate the MaTHiSiS platform at the assisted pilot premises with the different stakeholders, with the assistance of the MaTHiSiS consortium.

The assisted pilots for the CGDL case has been carried out by the National Organisation for the Certification of Qualifications and Vocational Guidance (E.O.P.P.E.P.) with the technical support of The Centre for Research and Technology Hellas (CERTH). The stakeholders selected for the validation are Techniki Ekpedeftiki Life Long Learning Center (KDVM), the Hellenic American College (HAEC) and Career In Progress (CIP), a private career counselling company, willing to support their learners and counselees (18-40 years old) for the smooth transition to today's challenging labour market.

The preparation activities of the assisted pilot include the:

- Identification of the training programme: (a) Create an E-career portfolio (b) Draft a Europass Curriculum Vitae (CV) and (c) Present One's self well at a career interview.
- Selection of the trainers (counsellors) and learners/counselees that will participate in the pilot: 3 trainers and 10-15 learners/counselees (18-40 age).
- Selection of the platform agents to be used: two Kinect2 stations with specific Laptops (CORE i7, Windows 10 etc.), two High Definition (HD) webcams and two tablets.
- Identification of the venues and planning of the scenario.
- Design and development of the learning experience process, with its learning goals and learning materials.

The assisted pilots were implemented in four sessions in November 2017:

- Session 1: Techniki Ekpedeftiki Life Long Learning Center (KDVM) with both Kinect2 stations and their Laptops, and two tablets at Techniki Ekpedeftiki premises.
- Session 2: Career In Progress (CIP) with both Kinect2 stations and their Laptops, and two tablets with their integrated cameras at Career In Progress premises.
- Session 3: Hellenic American College (HAEC) with both Kinect2 stations and their Laptops, and two tablets with their integrated cameras at Hellenic American College premises.
- Session 4: Techniki Ekpedeftiki Life Long Learning Center (KDVM) with both Kinect2 stations and their Laptops, and two tablets with their integrated cameras at Techniki Ekpedeftiki premises.

The evaluation activities were conducted in parallel with the assisted pilots' sessions. The evaluation approach was based on the framework defined in "D2.5 Evaluation Strategy" [2]. The MaTHiSiS Platform was successfully demonstrated in the 4 sessions, with minor internet connection and technical problems. The pedagogical objectives of the CGDL (E-Portfolio, Europass CV and Interview) were mainly reached except from some learners'/ counselees' learning sessions, due to technical issues of the platform that have been reported in this deliverable and that will be solved for the next phase ("real life") of the pilots.

# 1. Introduction

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The main objective of this deliverable is to explain the preparation, execution and the evaluation of the CGDL Case Assisted Pilot.

This document is divided into the following sections:

1. Short introduction concerning the CGDL case.
2. Identification of the MaTHiSiS pilot phases
3. Description of the preparation phase and the creation of the related learning graphs with the Learning Goals (LG), Smart Learning Atoms (SLA) and Learning Materials (LMs).
4. Explanation of the CGDL Assisted Pilot implementation.
5. Explanation of the CGDL Assisted Pilot evaluation including questionnaires and focus group analysis.
6. Conclusion including the recommendation for the final (Real Life Pilot) phase.

## 2. Career Guidance Distance Learning Case (CGDL)

### 2.1 Brief Description of CGDL

In the career guidance distance learning case, learners and counsees between 16 to 65 years old (university students to retirement years) have been addressed, although most of them were adults aged 18-40. As far as the trainers are concerned, Career Guidance Counsellors working at private career guidance services of the education-training/employment/social sector have been addressed.

Learners and counsees have been trained to create their e-career portfolios and Europass CVs and present themselves well at an interview. These 3 learning goals were selected for various reasons: The importance of E-portfolios as a tool for the presentation and evaluation of career management skills (CMS) has been stressed in recent works of several European career guidance organizations and networks such as the European Lifelong Guidance Policy Network (ELGPN) [1]. EOPPEP's E-portfolio which is the first learning goal, is based on the Key Competencies for Lifelong Learning European Reference Framework [3] and is included in ELGPN Tool No4 as a good European practice [4]. Concerning the second learning goal, EOPPEP as the Greek National Europass Center is responsible for the development and promotion of Europass documents. The Europass documents are considered as important tools that support integration of individuals to the labour market and for this reason they are under revision and further development from the European Union [5]. Finally, the third learning goal refers to the successful presentation of individuals at a career interview. This is considered by companies and career specialists as the most critical phase of job-search.

During the Assisted Pilots, the following LGs were prepared:

- Creating an e-career portfolio: Mother Language and Numeric Skills
- Draft your Europass CV: Educational History and Professional Experience
- Present yourself well at an interview: Answering Questions at an Interview and Personal Skills

Καλή γνώση και χρήση της Ελληνικής Γλώσσας

1 2 3 4

Πώς μπορείς να αναπτύξεις τη δεξιότητα καλής γνώσης και χρήσης της Ελληνικής Γλώσσας?

A. Κατά τη διάρκεια σπουδών στην Ελλάδα.

B. Κατά τη διάρκεια παρακολούθησης ελληνικών ταινιών.

C. Κατά τη διάρκεια ταξιδιών στην Ελλάδα.

D. Όλα τα παραπάνω.

Επόμενη Ερώτηση

Figure 1: Creating an e-career portfolio: Mother Language (Medium Level) SLA



Figure 2: Creating an e-career portfolio: Numeric Skills (Difficult Level) SLA

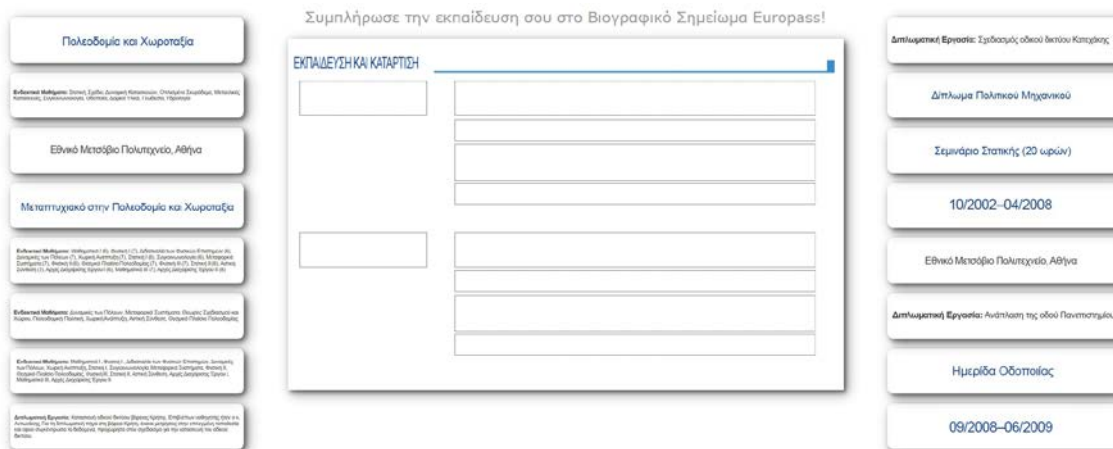


Figure 3: Draft your Europass CV: Educational History (Difficult Level) SLA



Figure 4: Present yourself well at an interview: Personal Skills (Difficult Level) SLA

## 2.2 Associated challenges and goals

Learners and counselees (students, graduates, unemployed persons etc.) who are looking for an educational decision or an employment decision depending on their background have a number of challenges in accessing the labour market. There is a lack of automation concerning the process of gaining specific skills, such as creating a useful e-portfolio, building a good CV and attending in a job interview. The opportunities for any sort of independence can be very limited. The accurate assessment of the individual knowledge of skills and progress is extremely difficult to evidence, it can be seen as insignificant and can be difficult to inform future planning. Currently, counsellors rely on assessment systems which are open to interruption and the subjective view of those working and educating the learners/counselees.

The rapid development in robotics and intelligent technologies gives us the opportunities to create new solutions to provide systems which remove this subjectivity and give us more meaningful and accurate assessments of these learners and counselees.

MaTHiSiS will be highly engaging and motivating for all learners/ counselees. It will help to enhance the access for these very complex learners/counselees both physically and cognitively increasing their participation in career guidance. The opportunities for truly understanding their means of expression and communication will better inform educators so their level of progress and achievement is accelerated. The learning processes of individuals will be intelligently informing the ongoing adaptation and design of the system to ensure progress is meaningful and working towards the positive lifelong outcomes for the individual. Creating this very learner specific ecosystem will give us the opportunity to create independence skills and meaningful activities within multiple learning platforms. The MaTHiSiS Project will take these advances in technologies and provide a platform which ensures smooth career development and access to quality career information and guidance are personalized to all learners/ counselees, including those with the most challenging characteristics.

### 3. MaTHiSiS Pilot Phases

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MaTHiSiS project implements a three step approach for the deployment of the pilots in three conceptually different and consecutive phases for each use case, introduced by a user and system requirements elicitation phase:

- Driver Pilots, which ran in June 2017: This pilot ran under the total supervision from the MaTHiSiS consortium. People at the venue setup and configured the system under MaTHiSiS consortium guidance following a training.
- Assisted Pilots that Assisted Pilots initiated the procedure in July 2017 and ran with the users in November 2017 with the assistance of the MaTHiSiS consortium. Based on the evaluation results of the Driver Pilots, and leading to the refinement of component and system level technology consolidation, an enhanced version of the MaTHiSiS platform has been tested during this phase. This deliverable reports the preparation, execution and evaluation of the Assisted Pilots phase.
- Real-life Pilots in the third year of the project (2018): final tests will occur approaching the end of this phase. This pilot will run autonomously by people at the venue.

## 4. CGDL Pilots Preparation Activities

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### 4.1 Stakeholders and training programme selection

In the preparatory phase of the CGDL assisted pilots, interviews were conducted with 3 different companies. The interviews with the Career Office of Hellenic American College and Techniki Ekpedeftiki S.A. were taken on 22 July and 28 July 2016 (see D2.2 [6]). The interview with Career In Progress was taken on 13 October 2017. Interviews in both cases were implemented with trained career guidance counsellors with professional experience in this field. Generally speaking, stakeholders were already familiar with modern technology (Personal Computers (PCs), tablets, smart phones, social networks and the internet). However, some counsellors older than 45 years, needed more training and support on using innovative systems. Teaching assistance is more needed concerning the use of MaTHiSiS platform and external tools such as the Learning Content Editor.

### 4.2 User and system requirements elicitation phase

The user requirements analysis made with CERTH has allowed identifying two main target users: general public as final beneficiaries of MaTHiSiS and counsellors of career guidance that will use MaTHiSiS as experts to create SLAs and Learning Graphs, as support of the learning experiences. In the first case, ages will range between 16-25 and 26-60 years, meanwhile for the second one ages will be between 28-65 (D2.2). As more tangible goals the following have been set:

- 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 labour market,
- to build career management skills,
- to define and recognize 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 sources of career information.

Regarding the technical aspect of the user requirements, EOPPEP had bought the necessary equipment following the requirements set by the technical partners. CERTH supported the process of buying the appropriate equipment (Kinect cameras, tablets etc.), including only parts that would be useful for EOPPEP and the stakeholders (e.g. EOPPEP and stakeholders don't use robots or IWBs), which were initially tested during the driver pilots. Furthermore, EOPPEP installed all the new releases in the MaTHiSiS platform (e.g. ES Clients v.0.8.6, ES Mobile etc.). EOPPEP with a long experience in career guidance material transformed the educational material into several SLAs that were ingested to MaTHiSiS system by CERTH. Compatibility of the platform with a large variety of brands of platform agents (PA) and with already established LMs was a key advantage.

The physical environment in which the assisted pilots were organized was rather a classical one: 'in-class' training using PCs, laptops or mobiles (tablets).

### 4.3 Development of Learning Goals, Smart Learning Atoms, Learning Materials

After having identified the user and system requirements and selecting the training to be integrated in the CGDL Assisted Pilots, the LGs and SLAs were characterised (see Table 2) and created with the

Learning Content Editor and integrated to the MaTHiSiS Platform together with the technical partner (CERTH). The existing LMs were adapted for the SLAs and, when necessary, new ones were created. All the LGs, SLAs and LMs are described in the table below. Taking into consideration the feedback from the driver pilots, regarding the LG “Create an e-career portfolio”, it was decided that the general SLA for the presentation of the e-portfolio should be removed, as it was confusing for the learners. Learning Graphs remained three in total. For the implementation of the Assisted Pilots the SLAs (a) e-portfolio (mother language skills, foreign language skills, numerical skills), (b) draft your Europass CV (educational history and work history), and (c) Present yourself well at an interview (Answering questions at an interview and personal skills) were implemented, to test different activities and to ensure the MaTHiSiS platform functionality.



Learning Goal (LG)	Weight of SLA to the goal (0 to 1.0)	Smart Learning Atom (SLA)	Learning Action (LA)	Platform Agent (PA)	Learning Material (LM) - Materialization
LG1: Create an e-career portfolio	0.8	Mother language skills	Follow a tutorial on demonstrating mother language skills in e-portfolio	PC TABLET / SMARTPHONE	PA presents an age appropriate (adolescent / adult) tutorial to the learner (VIDEO)
			Take a mother language skills validation test in e-portfolio		PA presents a quiz with adaptable questions (Multiple-choice questions AND scaffolded questions)
			Create an example demonstrating mother language skills in e-portfolio		PA asks the learner to prepare an example (drag & drop assignment)
	0.9	Foreign language skills	Follow a tutorial on demonstrating foreign language skills in e-portfolio	PC TABLET / SMARTPHONE	PA presents an age appropriate (adolescent / adult) tutorial to the learner (VIDEO)
			Take a foreign language skills validation test in e-portfolio		PA presents a quiz with adaptable questions (Multiple-choice questions AND scaffolded questions)
			Create an example demonstrating foreign language skills in e-portfolio		PA asks the learner to prepare an example (drag & drop assignment)
	0.9	Numeric skills	Follow a tutorial on demonstrating Numeric skills in e-portfolio	PC TABLET / SMARTPHONE	PA presents an age appropriate (adolescent / adult) tutorial to the learner (VIDEO)
			Take a Numeric skills validation test in e-portfolio		PA presents a quiz with adaptable questions (Multiple-choice questions AND scaffolded questions)
			Create an example demonstrating Numeric skills in e-portfolio		PA asks the learner to prepare an example (drag & drop assignment)
LG2: Draft your Europass CV	0.9	Educational history (comprehension)	Follow a tutorial on how to complete the educational history section of a Europass CV	PC TABLET / SMARTPHONE	PA presents an age appropriate (adolescent / adult) tutorial to the learner
			Take a test on completing the educational history section of a Europass CV		PA presents a quiz with adaptable questions (Multiple-choice questions AND scaffolded questions)

			Complete the educational history section of a Europass CV		PA asks the learner to prepare an example (drag & drop assignment)
	0.9	Professional experience (comprehension)	Follow a tutorial on how to complete the professional experience section of a Europass CV	PC TABLET / SMARTPHONE	PA presents an age appropriate (adolescent / adult) tutorial to the learner (VIDEO)
Take a test on completing the professional experience section of a Europass CV			PA presents a quiz with adaptable questions (Multiple-choice questions AND scaffolded questions)		
Complete the professional experience section of a Europass CV			PA asks the learner to prepare an example (drag & drop assignment)		
LG3: Present yourself well at an interview	0.8	Personal skills (comprehension)	Present personal skills in interview	PC TABLET / SMARTPHONE	Play a role-play simulation on answering scaffolded interview questions
	0.9	Asking questions at an interview (comprehension)	Answer interview questions	PC TABLET / SMARTPHONE	Play a role-play simulation on answering scaffolded interview questions

**Table 2: CGDL Assisted Pilot LGs, SLAs and LMs**

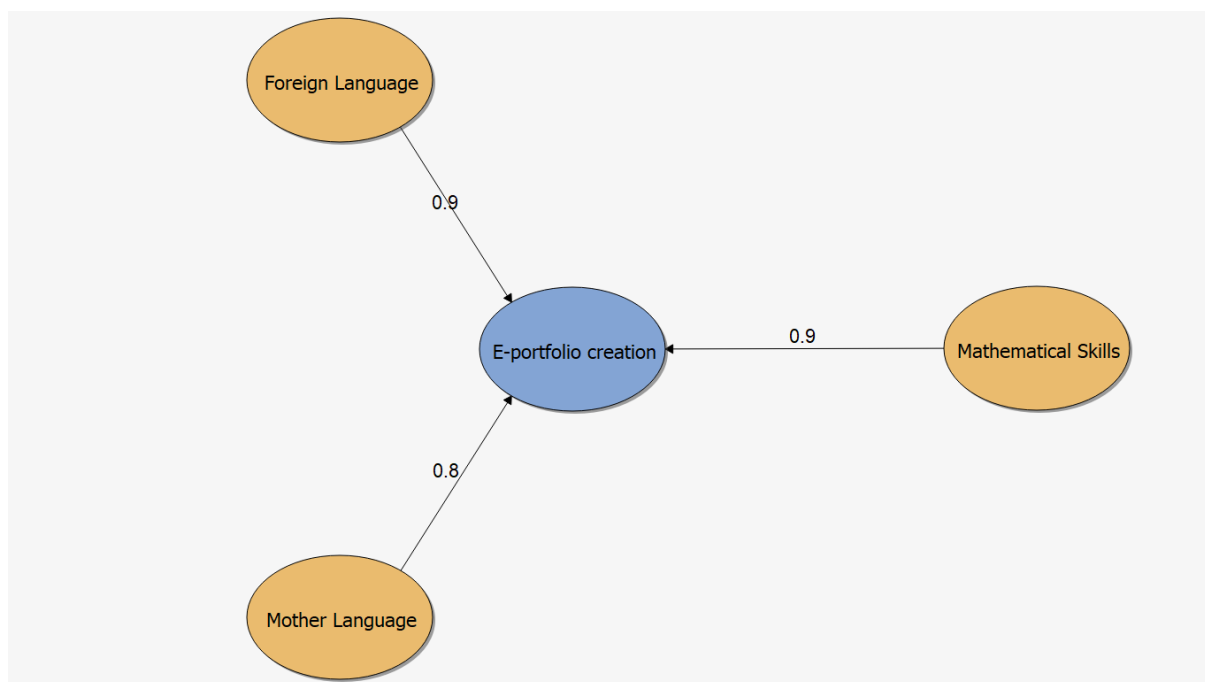


Figure 5: LG1 of the CGDL Assisted Pilot

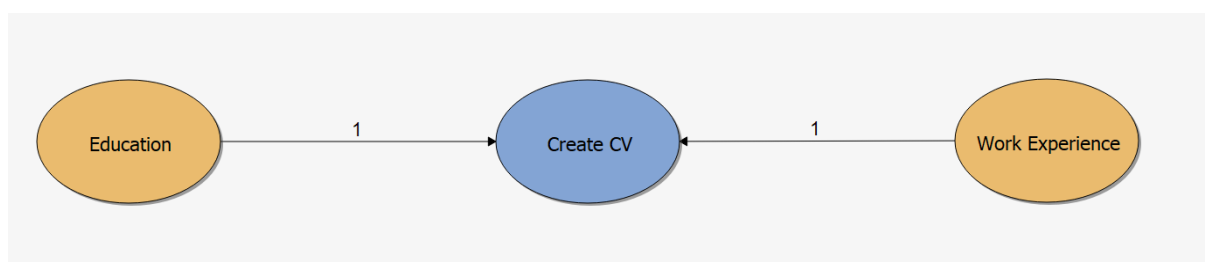


Figure 6: LG2 of the CGDL Assisted Pilot

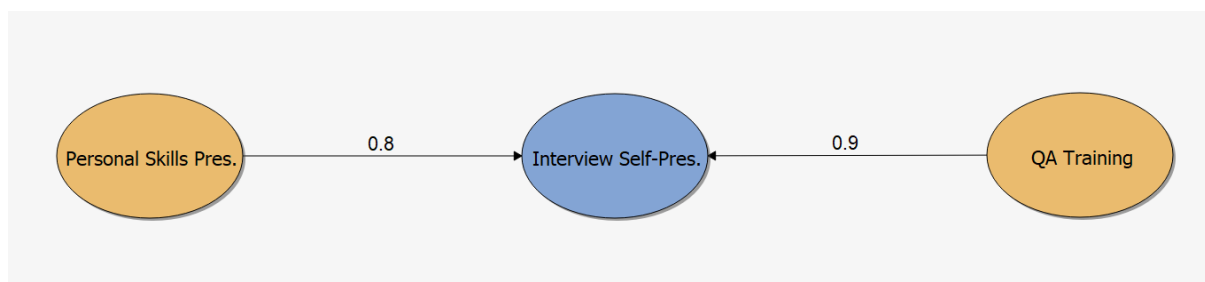


Figure 7: LG3 of the CGDL Assisted Pilot

#### 4.4 Platform agents and physical settings for the Assisted Pilots

The PAs selected to be used in the CGDL Assisted Pilots were the ones used in the driver pilots, which were purchased in order to test the system and the MaTHiSiS Platform, and were adapted to the training scenario defined. New releases in the Mathisis platform (e.g. ES Clients v.0.8.6, ES Mobile etc.) were also installed and configured according to the user manual.

#### 4.5 Setting of the venues

- **1<sup>st</sup> Assisted Pilot** was organized in Techniki Ekpedeftiki premises. EOPPEP partners visited the building and set the equipment. Both Kinect 2 stations and their Laptops were established on

specific desks. The Laptops were connected to the Techniki Ekpedeftiki wired internet connection, while the tablets were connected to the available Wifi networks. However, the Wifi connection was not very suitable for the MaTHiSiS platform, since there were some interruptions during the sessions.

- **2<sup>nd</sup> Assisted Pilot** was organized in Career In Progress premises. EOPPEP partners visited the building and set the equipment. Both Kinect 2 stations and their Laptops were established on specific desks. The Laptops were connected to the Career In Progress wired internet connection. The Wifi internet connection used with the tablets was suitable for the MaTHiSiS platform as the router was based in a close distance to the equipment.
- **3<sup>rd</sup> Assisted Pilot** was organized in the Hellenic American College (HAEC) premises. CERTH partners collaboratively with EOPPEP partners, supported the setting of the equipment and the configuration of the network remotely (skype connection, TeamViewer), as the necessary port was closed. Both Kinect 2 stations and their Laptops were established on specific desks. The Laptops were connected to Hellenic American College wired internet connection using a hub to connect the two laptops and adding an alternative station to become a wifi spot for the tablets.
- **4<sup>th</sup> Assisted Pilot** was organized in Techniki Ekpedeftiki premises. EOPPEP partners visited the building and set the equipment. Both Kinect 2 stations and their Laptops were established on specific desks. The Laptops were connected to the Techniki Ekpedeftiki wired internet connection, while the tablets were connected to the available Wifi networks. However, the Wifi connection was not very suitable for the MaTHiSiS platform, since there were some interruptions during the sessions.

#### 4.6 Trainers'/Counsellors' training

Before the Assisted Pilot, EOPPEP partners and some counsellors from the stakeholders, were trained to use the Learning Content Editor and create Learning Graphs. EOPPEP would like to stress the importance of developing clear and illustrated how-to manuals for training purposes of both trainers/ counsellors and learners/ counselees. The usage of the Learning Content Editor was quite difficult for the trainers/ counsellors that didn't have a strong technical background (which is a fact for a large number of counsellors for the CGDL case).

## 5. CGDL Assisted Pilots deployment and execution

### 5.1 CGDL Assisted Pilots fact sheet

Here under is presented a summary factsheet of the CGDL Assisted Pilots execution.

Organisation Name	EOPPEP, CERTH, Techniki Ekpedeftiki, Career In Progress, Hellenic American College
Period of the sessions	21 <sup>st</sup> November 2017 23 <sup>rd</sup> November 2017, 27 <sup>th</sup> November 2017, 4 <sup>th</sup> December 2017 (due to cancellation on 29 <sup>th</sup> November)
Number of sessions	4 sessions (2 Techniki Ekpedeftiki, 1 Hellenic American College, 1 Career In Progress)
Description of physical environment	Session 1: 2 Kinect2 stations with the laptops in Techniki Ekpedeftiki premises & 2 tablets tested Session 2: 2 Kinect2 stations with the laptops in Career In Progress premises & 2 tablets tested Session 3: 2 Kinect2 stations with the laptops in Hellenic American College premises & 2 tablets tested Session 4: 2 Kinect2 stations with the laptops in Techniki Ekpedeftiki premises & 2 tablets tested
Description of social environment	Session 1: 14 learners/ counselees (aged between 18-35) and 2 trainers/ counsellors Session 2: 15 learners/ counselees (aged between 18-40) and 2 trainers/ counsellors Session 3: 10 learners/ counselees (aged between 18-35) and 2 trainers/ counsellors Session 4: 2 learners/ counselees (aged between 18-35) and 2 trainers/ counsellors
Description of learning environment	Athens, Greece, training offices
Teachers involved (number and subjects)	8 trainers in total
Learners involved (number, age, peculiar condition, diagnosis or educational needs)	41 learners, 18-40 age, without any disabilities or learning problems, different level of ICT skills, some of them not speaking English.
Number of LG created	3
Number of SLA created	7

Number of LM created	17
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Table 3: CGDL Assisted Pilots Fact Sheet

### 5.1.1 Learners programme and user account creation and protection of personal information

The sessions of the CGDL assisted programme were organized with a specific planning table. For each trainer a specific pseudo name was created to protect the personal data of the learners. These pseudo names were used to create the user accounts in the MaTHiSiS Platform. All learners were informed (both by stakeholders' trainers and EOPPEP partners) about the assisted experimentation and its research aspects and asked to sign a specific consent form before entering the training.

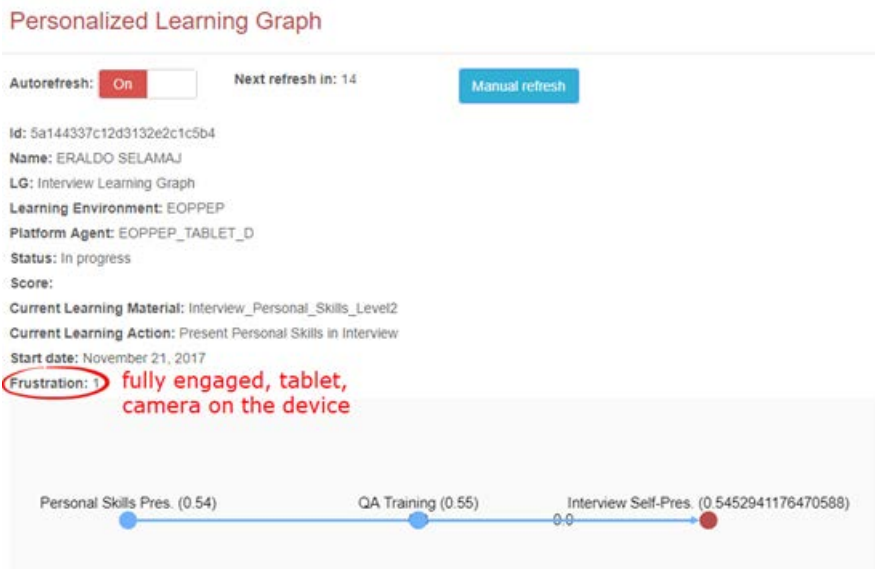
### 5.1.2 First Session - Techniki Ekpedefitiki

The first session of the Assisted Pilot took place on 21<sup>st</sup> November 2017 between 15.00 and 18.30 at Techniki Ekpedefitiki venue. EOPPEP partners visited the venue two hours earlier, supported the installation process concerning the total equipment (hardware and software) and presented the system to career guidance counsellors of Techniki Ekpedefitiki SA. The learners/ counselees were 14 students, while the role of the trainers was played by the above mentioned career counsellor of Techniki Ekpedefitiki and one counsellor by EOPPEP. Present at the pilots were partners of the EOPPEP project group.

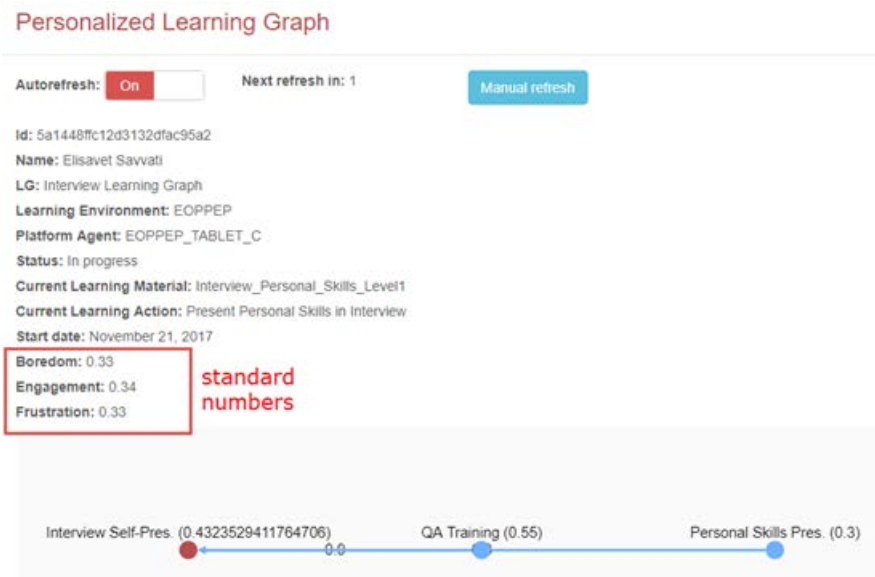
The MaTHiSiS Platform did not work very well with the Techniki Ekpedefitiki WiFi internet connection even though the WiFi connection was good, as the EOPPEP partners tested smartphones and laptops with other sites and applications and did not have any problems such as interruptions or delays. Furthermore, ethernet connection was used with laptops. However, the problem was solved after a while by using a team of two learners/ counselees rather than a team of four in parallel, in order to ensure a better WiFi connection.

At first, both the learners/ counselees and the trainer were introduced to MaTHiSiS and the pilots during a short (~ 15 minutes) presentation before entering the pilot room. The pilots started and the learners came to the Kinect 2 stations and the tablets one by one launching their accounts. However, the following issues occurred during the assisted pilot's learning sessions:

- a. The transition from one SLA to another was very slow and all users could see some "broken pages" with text like "{text} {image} [!#\$%]" before viewing the Learning Material.
- b. On tablets and laptops there were no figures for "boredom", "engagement" and "frustration" initially. Then, after completing one SLA, fixed values appeared (boredom 0.33, engagement: 0.34 and frustration 0.33), always the same for all users. After this, in many cases, frustration became 1.00 and the users could not view further SLAs. The last SLA kept showing even though the trainers were having high scores (75-100% score - correct answers) (see following Figures).



**Figure 8: Frustration level during the assisted pilot**



**Figure 9: Emotional levels during the assisted pilot**

c. Tablets had some issues concerning the accessibility and the compatibility of the content with mobile devices. For example, the drag & drop items within some LGs show some explanatory text when the user moves the mouse over the item. This movement was not recognized by the tablets, so the users could not view the text. In addition, within the interview LG, some shorter sentences (1 or 2 lines) had the ellipsis punctuation mark which confused the users because they were pressing on the answer waiting for the additional text to appear. Furthermore, some sentences on the drag & drop items were very small for the users to read.

d. There were many interruptions when using the tablets or the laptops. Users mentioned of logging out of the platform plenty of times or the transition between SLAs was very slow. However, it did not seem to be a connection issue, since this did not happen simultaneously at both tablets), and this occurred even with the laptop connected with the Ethernet cable. In addition, during the Interview LG the users could not see the results because the transition was very fast.

e. There were clones of some sessions without having created them.

f. The kinect2 sensor crashed many times. There was a pop up box loading and mentioning that the sensor stopped working properly. After that EOPPEP partners had to stop the SC and PA clients and start them again.

g. A user achieved 75% within the LG of e-portfolio at the SLA of mathematical skills. After that, the same quiz appeared while the engagement was at 0.33. The user stated that she was not feeling frustrated at all, but she was really excited instead.

After further discussions with the learners/ counselees to confirm their status, they clearly stated that they were fully engaged until the third or fourth time the same LM appeared. Then, they became bored. Since there were not any consequences based on their results in the Learning Material, it is logical to presume that they were telling the truth about their feelings. EOPPEP's opinion is that the actual figures of these statements are not very reliable. The user definitely knows how he/she feels and the system cannot contradict this statement. So maybe the system definitions of "boredom", "engagement" and "frustration" should be reconsidered. To raise their level of participation (not competence) the platform should give them an incentive or to show them something else more interesting or to get their attention with something.

Below Figure 10 shows some photos from the assisted pilot at Techniki Ekpedeftiki.

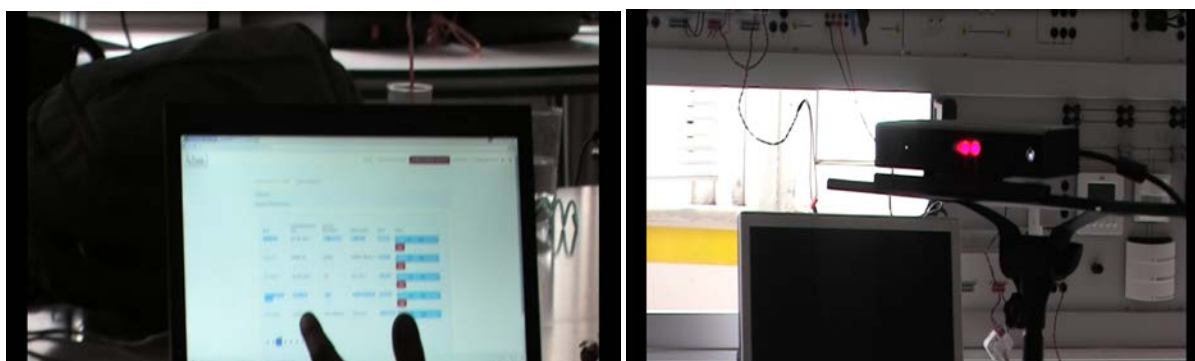


Figure 10: First Assisted Pilot at Techniki Ekpedeftiki

### 5.1.3 Second Session – Career In Progress

The 2<sup>nd</sup> session of the Assisted Pilot took place on the 23<sup>rd</sup> November 2017 at Career In Progress premises, between 12.00 and 17.00.

15 learners/ counselees and 2 trainers/ counsellors attended the process. Both were introduced to the MaTHiSiS Project and the pilots during a short (~ 15 minutes) presentation before entering the pilot room. The MaTHiSiS Platform worked satisfactorily well with the Career In Progress WiFi internet connection. However, after the crash of the first Kinect, the procedure was continued by using only one Kinect.

Overall, during the sessions the same issues appeared as in Techniki Ekpaideftiki.

Frustration levels affected the procedure even though the participants were mentioning different feelings such as engagement, or curiosity to complete the procedure. One user was smiling during the session and the Kinect2 camera crashed twice. After that incident, it was unable to function normally, and the procedure continued without the Kinect2 camera.

During the session of another user when the overview screen with the total score appeared, the process stopped. As soon as EOPPEP partners stopped the user from the learning experience supervisor and closed the browser, a message for the sensor crash of Kinect appeared. A user using the tablet touched the back button and the MaTHiSiS app stopped working. The counsellor tried to resume the LM from the Learning Experience Supervisor environment, but it did not work so the session had to be cancelled and restarted.



Users who reached weight 1 (maximum) at all SLAs had to continue the process by repeating the SLAs of the difficult level. The only way to stop the session was by the counsellor in the Learning Experience Supervisor environment to press stop.

Finally, on other main issue was the values for frustration which repeated the process even if the users were successful and engaged. Many users complained about the repetition of SLAs which were completed successfully (100%). The assessment of users' emotional state should be reexamined and be approached in a different way. As mentioned before, when a user is not engaged and shows boredom, then he/she should have an incentive to become more engaged to the procedure.

The Laptops were connected to the Techniki Ekpedeftiki wired internet connection, while the tablets were connected to the available Wifi networks. However, the Wifi connection was not very suitable for the MaTHiSiS platform, since there were some interruptions during the sessions. Below you can see a photo from the first session of pilots at Career In Progress.

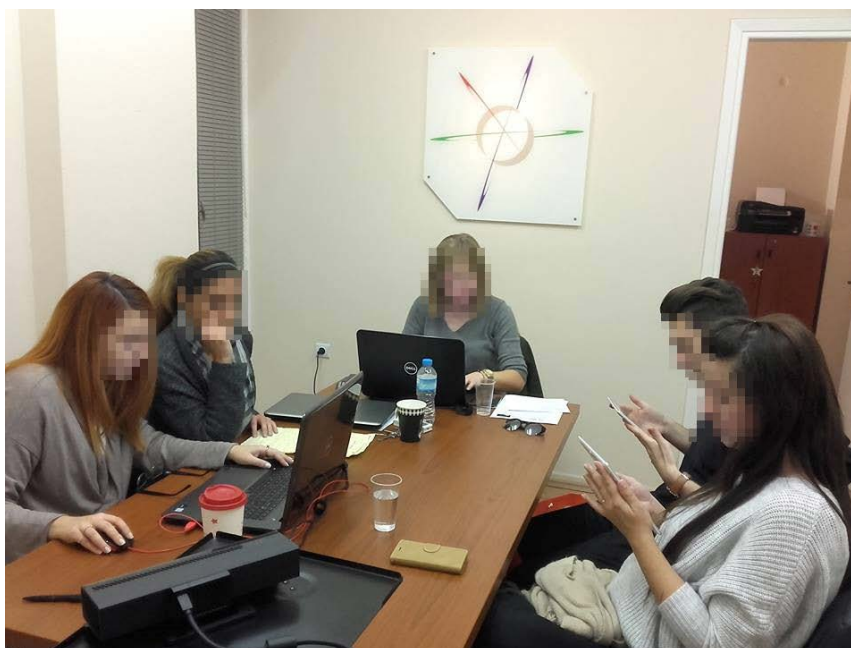


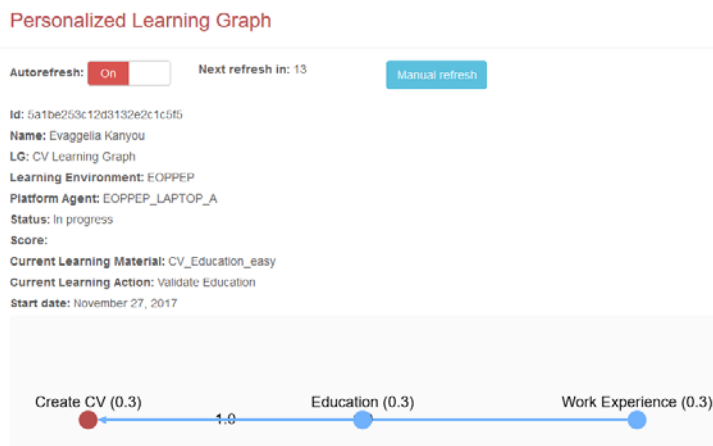
Figure 11: Assisted pilot at Career In Progress

#### 5.1.4 Third Session – Hellenic American College

The 3<sup>rd</sup> session of the Assisted Pilot took place on the 27<sup>th</sup> November 2017 at Hellenic American College premises, between 11.00 and 13.00. The Laptops were connected to Hellenic American College ethernet connection using a hub and a WiFi Spot that was created for the tablets.

10 learners/ counselees and 2 trainers/ counsellors attended the process. Both were introduced to the MaTHiSiS Project and the pilots during a short (~ 15 minutes) presentation before entering the pilot room. Same problems occurred as the previous pilots. The frustration levels were repeating the procedure even though the SLAs were completed successfully.

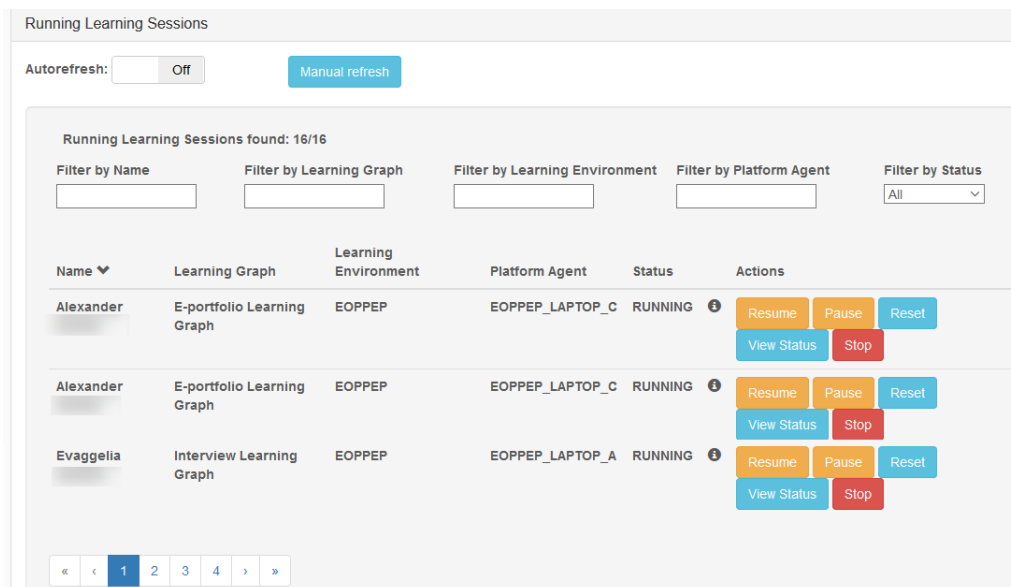
One user repeated the same SLA using different PA. When using the laptop with the Kinect camera, the SLA kept repeating even though there were no figures for emotions. However, when she repeated the SLA using a tablet, the user was able to complete the SLAs successfully until the tablet showed high frustration. To be noted that the user was very interested in the pilots and she wanted to participate to the next pilot as well.



**Figure 12: No emotional figures after completing the SLA while using a laptop**

Another user used different PA as well because of the high frustration levels that the Kinect showed. In his case the procedure continued until he reached 1 in the LG.

In addition, at the Running Learning Sessions there were clones of the users, as mentioned before. There were some problems with the control panel as well as it was refreshing all the time before the appropriate time (when it was set in the auto-refresh).



**Figure 13: Clones of users during the Assisted Pilot**

### 5.1.5 Fourth Session – Techniki Ekpaideftiki

The 4<sup>th</sup> session of the Assisted Pilot took place on the 4<sup>th</sup> December 2017 at Techniki Ekpaideftiki premises, between 09.00 and 11.30. The two laptops were connected to the ethernet internet of the premises. The two tablets were used with WiFi connection.

2 learners/ counseles (out of the 11) and 1 trainer/ counsellor attended the process. All were introduced to the MaTHiSiS Project and the pilots during a short (~ 15 minutes) presentation before entering the pilot room. Only two learners/ counseles were interested in participating to the pilot. The learners/ counseles that did not want to attend were asked for the reasons and some of them replied that they just did not want to do it/ were not interested in it (no motivation), while others expressed doubts concerning their personal data (since cameras were included in the process they felt insecure).

## 6. Evaluation of the CGDL Assisted Pilots

The objective of the evaluation of CGDL Assisted Pilots was to evaluate the platform functionalities, interfaces and define the recommendation for the real life pilots' phase. The evaluation processes defined in the D2.5 was translated into a web based questionnaire survey by <https://www.qualtrics.com/>. Two different surveys were created:

one for the trainers/ counsellors:

[https://ntupsychology.eu.qualtrics.com/jfe/form/SV\\_9nwYnOvXCfGJeFD](https://ntupsychology.eu.qualtrics.com/jfe/form/SV_9nwYnOvXCfGJeFD)

and one for the learners/ counselees:

[https://ntupsychology.eu.qualtrics.com/jfe/form/SV\\_em5myVIUQEAu6WN](https://ntupsychology.eu.qualtrics.com/jfe/form/SV_em5myVIUQEAu6WN)

Concerning the trainers/counsellors the total questionnaires answered were limited since only a small number actually could use the MaTHiSiS tools for creating their own LGs and SLAs. Trainers/counsellors also filled in a questionnaire about PAs that will be evaluated within WP6 Collaboration and Decision Support System.

Additionally, to the above-mentioned questionnaires, a focus group interview was implemented with a number of counsellors. The analysis of both evaluation methods is presented in the following sections.

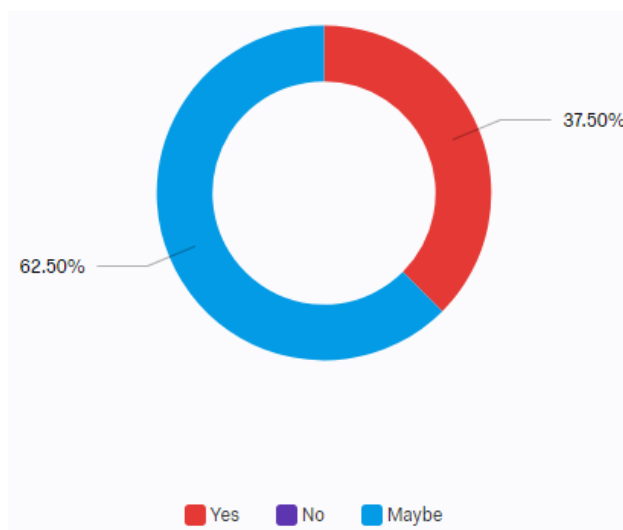
### 6.1 Questionnaires' Analysis

#### 6.1.1 KPI#1 Usability

KPI#1 for usability, measures the quality of fit (of MaTHiSiS) in the educational purpose it was set out to serve, i.e. to re-define current learning practices into highly individualized and adaptive, goal-oriented learning, while at the same serve pedagogical purposes and facilitate traditional educational structures. Also, from a user experience point, it measures the quality of users (trainers/ counsellors or learners/ counselees) to actively see MaTHiSiS as a useful and functional tool.

##### 6.1.1.1 Trainer/ Counsellor

**Q15 - Does MaTHiSiS help you to provide individualized and adaptive learning to your counselees?**



**Figure 14: Trainers' response on if MaTHiSiS helps to provide individualized and adaptive learning to learners/ counselees (Yes, No, Maybe)**

### Do you think that MaTHiSiS increases the level of engagement of learners?

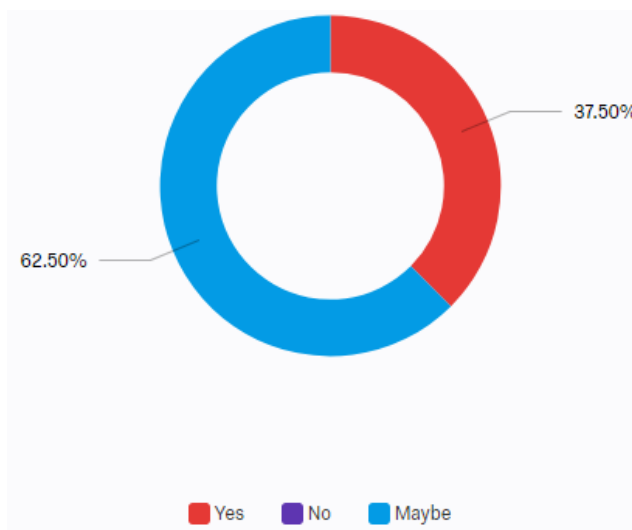


Figure 15: Trainers' response on if MaTHiSiS increases the level of engagement of learners (Yes, No, Maybe)

### Do you think that MaTHiSiS increases the access to career guidance for people who do not have access at all?

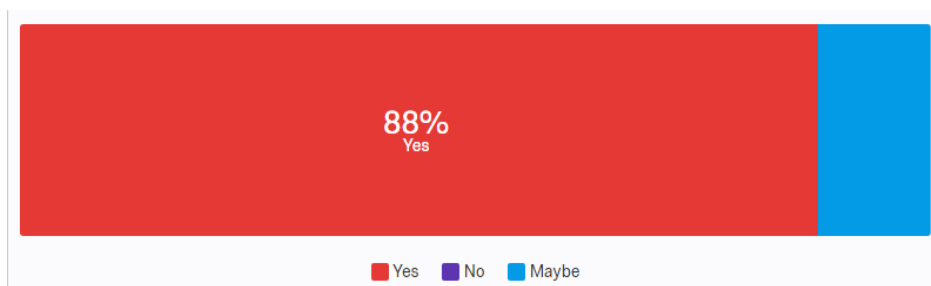


Figure 16: Trainers' response on if MaTHiSiS increases the access to career guidance for people who do not have access at all (Yes, No, Maybe)

### How easy was MaTHiSiS to use?

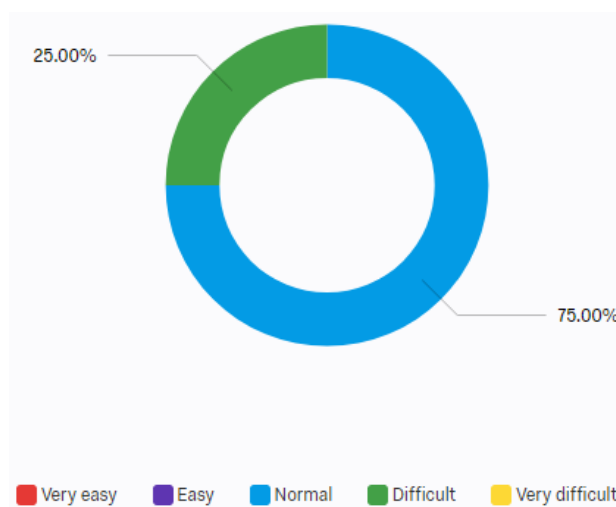


Figure 17: Trainers' response on how easy was MaTHiSiS to use (very easy, easy, normal, difficult, very difficult)

### What are the main usability issues you found?

Trainers/ Counsellors mentioned that the main usability issues had to do with the user interface and the system set-up. It was quite complex for them. Moreover, the interface of the Learning Content Editor was mentioned as difficult to use.

### What level of support did you need when using MaTHiSiS?

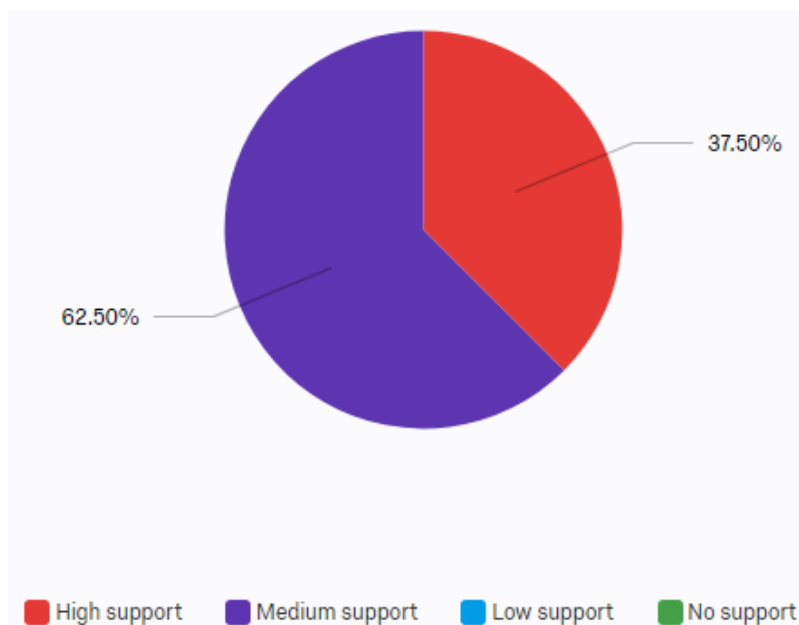


Figure 18: Trainers’ response on the level of support needed when using MaTHiSiS (high support, medium support, low support, no support)

### If you have created Learning Graphs with the Learning Content Editor tool, how easy was it to create the Learning Graphs?

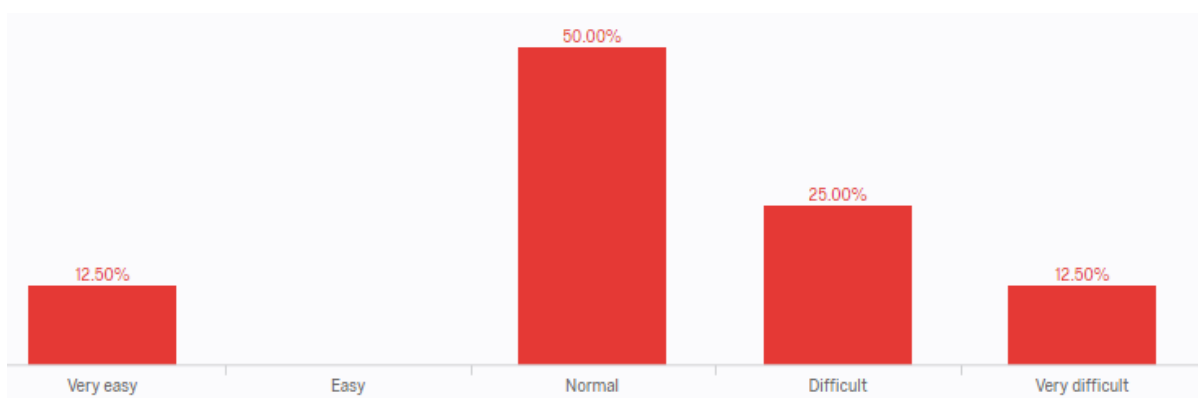
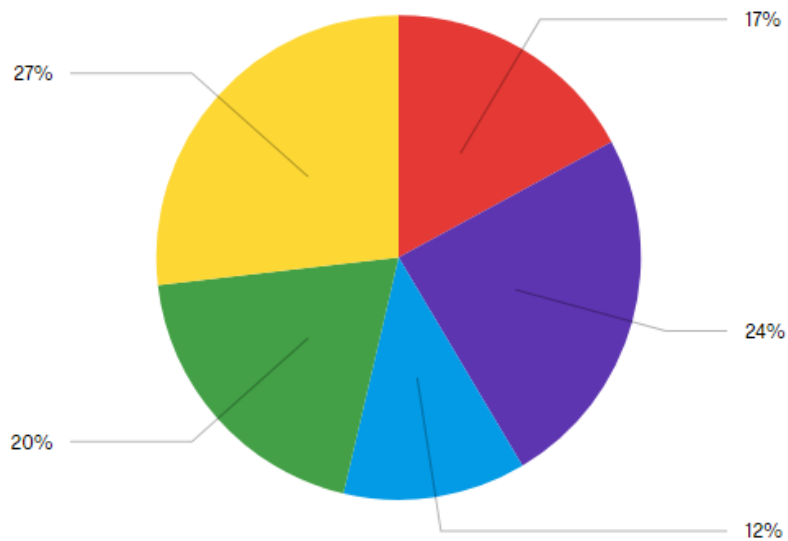


Figure 19: Trainers’ response on how easy was it to create the Learning Graphs (very easy, easy, normal, difficult, very difficult)

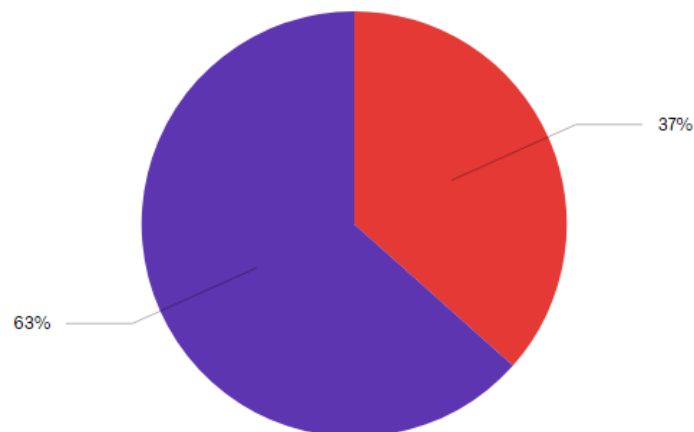
### 6.1.1.2 Learners/ Counselees

**How easy was it for you to achieve the learning goal? (1-5, 1 very easy, 5 very hard)**



**Figure 20: Learners' evaluation result of the easiness to achieve learning goals (1-5, 1 very easy, 5 very hard)**

**Was the learning activity finished without any system errors?**



**Figure 21: Learners' evaluation result of the occurrence of system errors**

Learners were asked to define the errors that occurred during the learning process and they mentioned that (a) there were mainly some connectivity issues, especially those who used WiFi connection with their devices, so the process was interrupted many times, (b) sometimes the process “froze” and they couldn’t move to the next SLA, (c) sometimes the learning experience couldn’t even start, so the local clients had to be restarted 1-2 times to view the learning content.

**Did you find any aspects of the system confusing or difficult to execute? What were those aspects and how can they be improved?**

The learners/ counselees didn’t find any aspects of the system confusing or difficult to execute. They only mentioned some aspects concerning the learning content, so some improvements will be

implemented during the next phase. For example, some mentioned that the LM was too easy for them so the levels of difficulty could be re-defined.

### Was the system motivating enough? (Did it provide strong motives?) (E.g. career gains like CV-portfolio made etc.)

For the learners the system was motivating or quite motivating, as they could learn new things and widen their skills. Only a few (16%) mentioned that it was not motivating at all.

#### 6.1.2 KPI#2 Reusability

KPI#2 for reusability measures the capacity and quality of the MaTHiSiS approach to uphold reusable learning structures, especially so in terms of the primordial learning elements that it introduces, i.e. the Smart Learning Atoms (SLAs). Reusability is supported by all learning content structures in MaTHiSiS (i.e. Learning Graphs, SLAs) as well as by the high-level conceptualisations of learning activities (i.e. the Learning Actions), however the core of the MaTHiSiS approach lies in the reusability of SLAs, therefore that is where the first round of input from the users was focused on.

### In your opinion are the SLAs designed to be reusable in different learning experiences?

All trainers/counselors answered that the SLAs are actually designed to be reusable in different learning experiences.

### Do you believe that the learners/ counsees will be engaged when re-using SLAs?

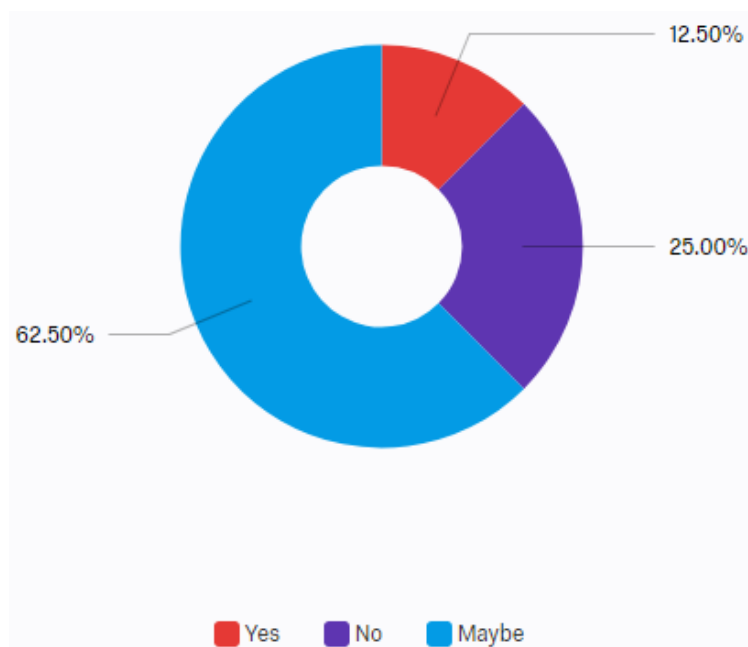


Figure 22: Trainers' response on their opinion concerning the learners'/ counsees' engagement when re-using SLAs

### 6.1.3 KPI#3 Non-linearity

KPI#3 for non-linearity measures the ability of MaTHiSiS system to create Learning Experiences that are decoupled from the traditional progression of learning goals and that support highly individualized goal-oriented Learning Experiences.

**Did the system permit the learning of an SLA without being based on the achievement of another SLA?**

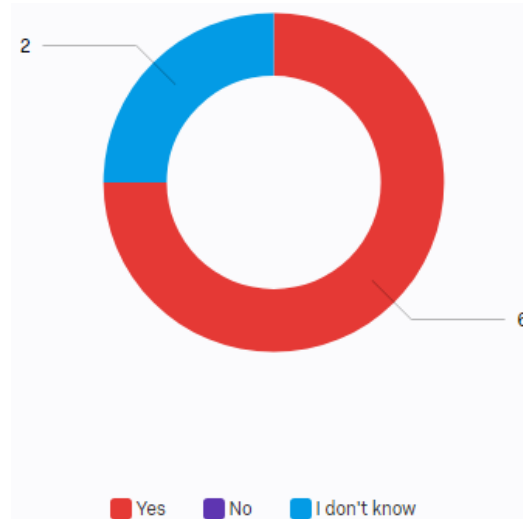


Figure 23: Trainers' response on the system's permission of learning an SLA without being based on the achievement of another SLA

### 6.1.4 KPI#4 Accessibility

KPI#3 for accessibility measures the quality for MaTHiSiS to transfer the learning material in a way that is obtainable for the user or supports users with any physical, cognitive or sensory impairments. Also from a system service point of view, it measures the quality of MaTHiSiS to be available as a quick, reliable service throughout the architecture without interruptions and delay.

#### 6.1.4.1 Trainer/ Counsellor

**Could MaTHiSiS be used by any of your users with physical, sensory and cognitive impairments?**

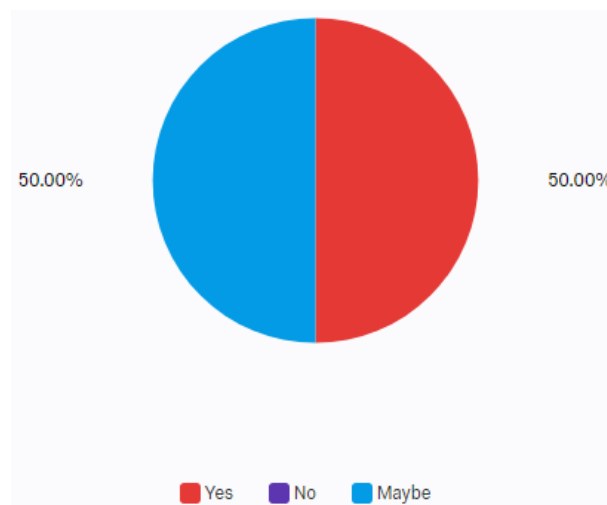
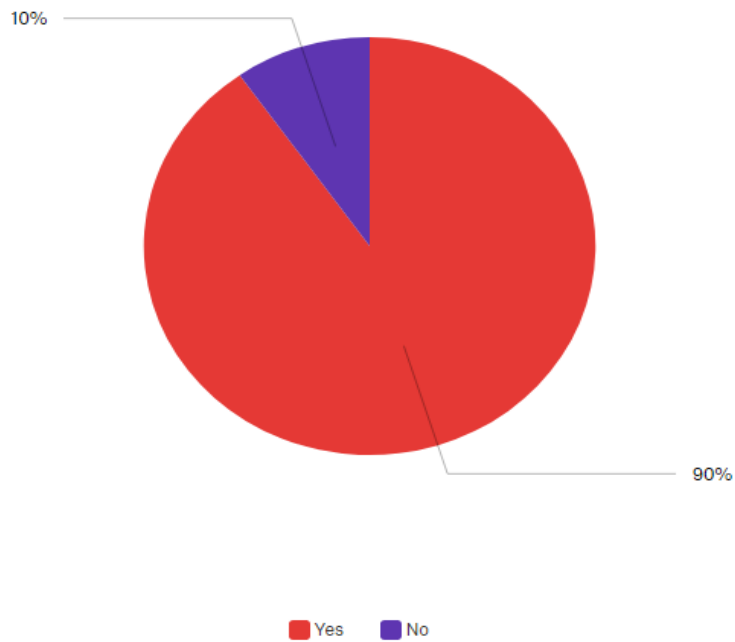


Figure 24: Trainers' results for the MaTHiSiS usage by users with physical, sensory and cognitive impairments (Yes, No, Maybe)



**6.1.4.2 Learners/ Counselees**

**Was the system accessible enough according to your needs?**



**Figure 25: Learner results for system accessibility (Yes / No)**

Learners/ counselees answered that the system was accessible. Only a small percentage (10%) couldn't access the learning content and that was mainly through the mobile devices (tablets) and due to connectivity issues.

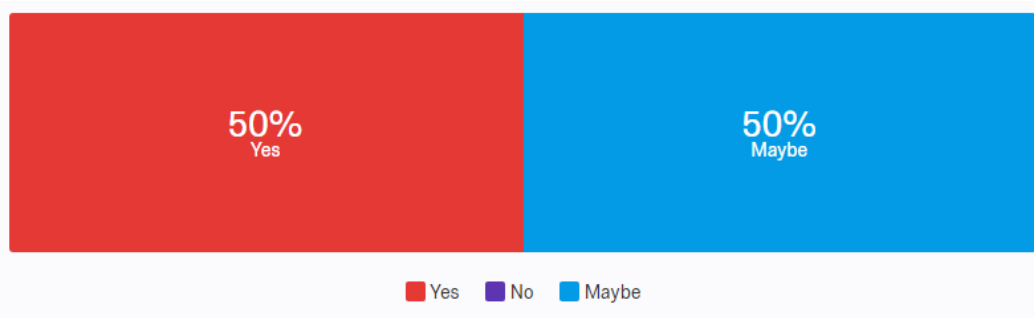
**6.1.5 KPI#5 Ubiquity**

KP#5 for ubiquity measures the ability of the MaTHiSiS platform to warrant efficient ubiquitous learning across a variety of educational contexts, i.e. learn anywhere, anytime for the same learning objectives. As for this first piloting phase the settings elected where solely the classrooms within the collaborating educational institutions, evaluation cannot be complete or reliable, but it should provide a first insight on this KPI.

**6.1.5.1 Trainer/ Counsellor**

**Do you think that MaTHiSiS could work outside of the classroom and in different settings? In what other setting(s) do you think this could be used?**

Trainers/ Counselors answered that the MaTHiSiS platform could be used in different settings. More specifically, they mentioned outdoors and home/school as main alternatives.



**Figure 26: Trainers' results for the usage of MaTHiSiS in different setting (Yes / No / Maybe)**

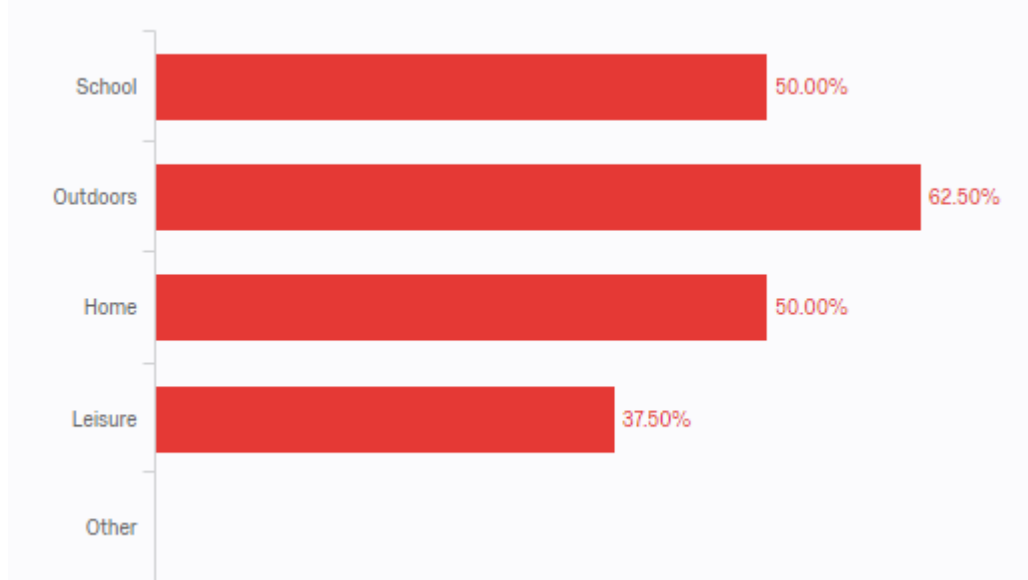


Figure 27: Trainers' results for the usage of MaTHiSiS in different settings

#### 6.1.5.2 Learners/ Counselees

### In what other settings could the client use this learning activity (at home, at work, on the move)?

Learners/ counselees answered that the MaTHiSiS platform could be used mainly used at home, while many answered that it could be used anywhere with internet connection.

#### 6.1.6 KPI#6 Ethical adherence

KP#5 for ethical adherence measures the quality of MaTHiSiS to apply appropriate ethical protocols of the technical/research institutions that are involved in the deployment of the MaTHiSiS components and also of the testing bed schools or organizations.

### Do you have any ethical concerns while using the system?

No ethical concerns were raised by the trainers/ counsellors.

## 6.2 Focus Group Interviews Analysis

The following sections present in detail the focus group implementation and analysis of the answers received by the counsellors of the CGDL. Within the analysis section, answers of the trainers within Industrial Training Scenario were also included, since some similarities were noticed.

### 6.2.1 Focus Group Implementation

The focus group of the CGDL scenario took place in December 2017, just after the completion of the assisted pilots. The trainers-counsellors of the stakeholders were asked to give further feedback by attending the interview. Three from a total of eight counsellors participated. The focus group took place at the Hellenic American College facilities.

All counsellors had been present during the pilot, had been initially trained on the MaTHiSiS platform and had watched their learners' progress. Moreover, they had used the Learning Content Editor to create some Learning Graphs. However, they were not involved in the set-up process before the learning sessions. This was mainly implemented by EOPPEP partners to avoid difficulties.

## 6.2.2 Focus Group Questions and indicative answers

The following questions were asked during the focus group interview. Some indicative answers are also presented.

### EDUCATIONAL DIMENSION

**1. Did MATHiSiS help learners to learn more efficiently the SLAs?**

C1 : [...] *some of them found the material quite interesting and challenging [...]*

C2 : *Yes, I think that the system has many advantages that help students to learn the material quicker than the traditional method [...]*

C3 : *Yes, I agree that the learners were able to learn more efficiently the SLAs [...]*

**2. Did MATHiSiS help you to provide individualised and adaptive learning to your students?**

C1 : *Yes, it provided individualised learning because each of the students were doing different activities [...] and their experience was individualised each time.*

C2 : *I think, yes [...] the system can adapt to the individual goal for each counselee.*

C3 : *In most cases I believe that it was quite adaptive but in others [...]*

**3. From your point of view, what are the benefits to students and educators of using MaTHiSiS in learning and teaching, respectively? And what are the issues maybe of using the platform?**

C1 : [...] *this asynchronous process gives them time so there is time elasticity for the learners to think and respond. [...] Now problems could be faced with technology because you need a very good network, a very good internet connection and the fact the platform is a bit heavy and it must be installed in specific computers, but I guess that will be resolved in the future.*

C2 : [...] *main benefit is that the material after some improvements could be made available by distance and at times and places that can be adjusted to the needs of the learners. [...]*

C3 : [...] *from their houses and they can learn in their own rhythm [...]*

### ORGANIZATIONAL DIMENSION

**1. So, do you think that teachers would need technical skills for the use of MaTHiSiS?**

C1 : *Well yes I think that they must have at least basic skills [...] they need guidance [...]*

C2 : *Definitely yes. Yeah.*

C3 : *Yeap! I agree with that. Teachers will definitely need technical support [...]*

**2. From your point of view which are the main barriers for the use of MaTHiSiS in your schools?**

C1 : *Well apart from technical aspects one major barrier is the culture [...]*

C2 : *I think that the system, as it is now, demands very expensive resources in terms of computers and all that which are not very usual to every organisation, at least to us, [...]*

C3 : *And I would like to add that you need to train the teachers [...]*

### USABILITY AND ACCESSIBILITY DIMENSION/ SOCIAL DIMENSION

**1. So, concerning the usability and accessibility what sort of problems did you have in using the system? And what level of support do you think that is needed to use it?**

C1 : *Well, you need a lot of support to use it, at least at the beginning sessions [...]*

C2 : *Absolutely I agree.*

C3 : *I agree [...]*

**2. So, now concerning your students how easy do you think it was for them to use the system? And did they actually enjoy this?**

C1 : *For the students it was quite easy and straightforward [...] they enjoyed it. It was good.*

C2 : *Yes, I agree they enjoyed it as a new procedure. [...]*

C3 : *Yes, I agree [...]*

### **ETHICAL DIMENSION**

#### **1. So, are there any ethical concerns about the system?**

C1 : *As a trainer I could see the names of the learners [...]*

C2 : *[...] the system should be used always in combination with face to face counselling, face to face contact with the counsellors. [...]*

C3 : *Well, I don't have anything to add [...]*

### **6.2.3 Focus Group Answers Analysis**

Within the analysis section, not only answers of the CGDL scenario were taken into consideration, but also, answers of the trainer of the Industrial Training Scenario was also included, since some similarities were noticed. Both quantitative and qualitative analysis aim to reduce and summarize a larger body of data to a more manageable “message” or “set of messages”. However, the biggest difference is that quantitative analysis aims to answer questions about figures. Qualitative processes are not concerned with numbers but with what was being said and sometimes how it was said. A group of researchers implemented the thematic analysis of the focus group to identify patterns of meaning across a data set that provides an answer to the research question being asked following the steps below:

1. **Familiarization with the data:** read through the transcripts to get an idea of the context in which interesting sections of text occur.
2. **Generation of initial codes:** Codes are essentially tags or labels which are assigned to sections of the text that are of interest to enable categorization of key concepts while preserving the context in which the concepts occur.
3. **Searching for themes:** which involved grouping all codes into potential themes.
4. **Reviewing themes:** between partners.
5. **Refining and naming themes:** set for each theme a clear definition making sure it has a meaningful label, definition, inclusion criteria, exclusion criteria and examples of positive and negative occurrence.

### **FOCUS GROUP (CGDL CASE) THEMES AND COMMENTS**

#### *Educational Dimension*

- Interesting & Challenging/Engagement
- Lack of Depth
- Faster Learning
- Realistic Exposure
- Time & Space Elasticity
- Curiosity & Enthusiasm
- Repetition
- Individualized Learning
- Barriers in Individualised Learning
- Automatic Evaluation
- Not Clear Evaluation

All counsellors totally agreed on the efficiency of MaTHiSiS. The SLAs were characterized as interesting and challenging, while they learn “quicker” compared to the traditional method. One counsellor mentioned the learner’s background as a dimension to measure efficiency. In addition, all

counsellors mentioned individualization and adaptivity as main characteristics of MaTHiSiS. Different activities and different learning goals contribute to this. One counsellor mentioned that the platform is “quite adaptive” possibly due to technical problems.

Finally, all counsellors mentioned the time and location elasticity (learners can complete the SLAs on their own pace (rhythm) and from different places (house). Repetition and automatic evaluation were also referred as main benefits. Concerning the issues, counsellors expressed their concerns on the “heavy” technical requirements (good internet connection, pre-installations) and more details on the learners’ progress.

#### *Organizational Dimension*

- Non Technical Minded Culture/Culture
- Expensive Resources
- Teacher Training
- Data Protection

All counsellors agreed that they would definitely need technical skills to use MaTHiSiS and further guidance. Moreover, one counsellor mentioned that the platform was not user-friendly. Referring to the Industrial Training scenario, the trainer also mentioned that minimum technical skills are necessary. Moreover, prerequisite knowledge is necessary.

Counsellors of the CGDL scenario, also mentioned technical aspects and difficulty in usage. C1 made a significant comment on the aspect of culture (e.g. in Greece people are not very technical-minded). C2 belongs to a public organization, so the cost of the resources needed was mentioned as a main barrier. C3 highlighted the dimension of additional support (training) because of the difficulty in usage.

The Industrial Training scenario trainer was specifically asked about the cost of MaTHiSiS (if it is a barrier) but the answer was negative (unlike CGDL counsellor C2). Difficulty in usage and technical issues (both similarly to CGDL counsellors) were mentioned as barriers. Moreover, one noteworthy comment was about the data protection, since some learners refused to participate due to doubts concerning certain parameters. Finally, the trainer expressed possible integration of technology in their classrooms by adding webcams in the future.

#### *Usability and Accessibility Dimension/ Social Dimension*

##### Trainers-Counsellors

- ICT Knowledge/Technical Skills
- Technical Support
- Not User-Friendly
- Complicated

##### Learners/ counselees

- Easy & Straightforward
- Enjoyment
- Not User-Friendly
- Frustration
- Curiosity & Enthusiasm

Concerning the CGDL scenario, the counsellors characterized the platform mainly as complicated and they needed support not only to create their LGs but also to interpret the learners’ progress graphs. However, the Industrial Training scenario trainer also mentioned complicacy concerning the LMs creation (didn’t understand the process since technical partners created the content at this stage). Concerning the students, the fact that the sensorial component and platform agent client should be launched locally on each device, is of additional complicacy for the process. Concerning the level of

support, the trainer also mentioned that little more support is needed, especially when referring to the learning material creation.

CGDL counsellors mentioned that all learners actually enjoyed the process, since it was something new and innovative. Improvements concerning the user interface and the compatibility with mobile devices of different dimensions would be useful. In addition, the Industrial Training scenario trainer mentioned that the students found the initialization process quite “painful” (setting up of local clients and components). However, the educational process itself continued smoothly. As worst aspect of the system the part of clients set up at each device was mentioned (similarly to CGDL).

#### *Ethical Dimension*

- Anonymity
- Combination with face-to-face Sessions
- Learning Restrictions (Learning too complicated to be restricted by mechanical procedures)

Both CGDL and Industrial Training scenarios’ counsellors/ trainers, expressed some concerns about the anonymity of the students, since names and surnames are known. So, the extend of anonymity did not seem so clear. The matching of names with codes or pseudos was mentioned as a solution.

### **6.3 Improvements to be made for the real-life pilots**

According to the feedback, the settings of the sensorial component and the platform agent clients are the main improvements to be done for an autonomous use of MaTHiSiS. During the assisted pilots, the setting of the clients proved to be too complex to set.

A significant notice was that it would be useful for the learners/ counselees to have a detailed history of each learner’s performance. For example, which LGs were assigned to each learner/ counselee, when were they implemented, what was the daily/monthly/yearly progress etc. Moreover, detailed manuals (for the learners and the trainers) concerning the user environments and the "technical" targets (which value should be reached for every SLA to move on) would be useful.

Finally, when the real-life pilot is set, it must be certain that everything works. There should not be any new versions during the pilot, or changes. When the tutors reach the stakeholders for the pilot everything should be checked and tested. And one of the things that must be verified is the stakeholders’ internet connection and firewall settings. In the future the majority of MaTHiSiS users will not have the technical skills to understand the problem and solve it.

## 7. Conclusion

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The CGDL Assisted Pilots were organised in four sessions on 21<sup>st</sup>, 23<sup>rd</sup>, and 27<sup>th</sup> of November and 4<sup>th</sup> of December 2017 in Techniki Ekpedeftiki, Career In Progress and Hellenic American College premises. 41 learners/ counselees and 8 trainers/ counsellors participated at the pilot. 3 LGs and 7 related SLAs were created, while 17 LMs were created and provided by EOPPEP. The experience of the MaTHiSiS Platform by the trainer was smooth and quite easy. The MaTHiSiS Platform was successfully used in all sessions by the trainers and learners, with some internet connection, technical and organisational problems. The pedagogical objectives of the CGDL training, (a) create a personal e-portfolio referring to mother and foreign language skills and the numerical skills, (b) draft your Europass CV referring to educational and work history, and (c) the Present yourself well at an interview referring to answering questions at an interview and personal skills were mainly reached despite only few sessions.

The trainers and learners were very enthusiastic to participate in the assisted pilots because they realised they were attending an important European project. This enthusiasm lasted for the whole pilot and most of the learners expressed their willingness to go on with the experimentation by participating in the real-life pilots. Regarding the trainers, they stated that they are very interested in the concept of MaTHiSiS and they are looking forward to seeing the future implementation at its full capacities, although they found the perspective of the MaTHiSiS platform rather too ambitious.

For the real-life pilot in the future it is necessary:

1. To implement some additional testing in order to achieve the pedagogical objectives in total.
2. To re-examine the interpretation of the user's emotions so as not to show frustration for most of the users.
3. The internet connection and firewall settings of the stakeholders' premises should be checked and verified, before the pilot's implementation.
4. The setting of the SC client and PA client should be simplified in order to allow a remote use of MaTHiSiS by learners.

The results of this document will be used as an input for the CGDL real-life pilots' organization phase.

## 6. References

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