Managing Affective-learning THrough Intelligent atoms and Smart InteractionS

D9.1 Report on Industrial Training pilots

Workpackage	WP9 – Pilots in Industrial Training and Career Guidance
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Status-Version:	Final – v1.0
Due Date:	30/04/2017
Submission Date	04/07/2017
EC Distribution:	PU
Abstract:	This deliverable reports on the preparation, execution and evaluation of the MaTHiSiS Industrial Training Case driver pilot.
Keywords:	Industrial training case (ITC), Driver Pilot, Smart Learning Atoms
Related Deliverable(s)	D2.2 Full scenarios of all use cases; D2.5 Evaluation strategy;

This document is issued within the frame and for the purpose of the *MATHISIS* project. This project has received funding from the European Union's Horizon 2020 Programme (H2020-ICT-2015) under Grant Agreement No. 687772

Document History

Version	Date	Change editors	Changes
0.1	23/06/2017	Hanna-Kaisa Saari (AV), Renaud Delahey (IDGEO), Thomas Techene (DXT)	Submission for the first internal review
0.2	26/06/2017	ATOS	Quality review
0.3	28/06/2017	Hanna-Kaisa Saari (AV)	Submission for the second internal review
0.4	29/06/2017	CERTH	Quality review
0.5	30/06/2017	Hanna-Kaisa Saari (AV)	Revision based on internal review
0.5	03/07/2017	ATOS	Quality review
0.6	04/07/2017	Hanna-Kaisa Saari (AV)	Revision based on internal review. Version sent to ATOS for final review
0.7	04/07/2017	ATOS	Final Quality review
1.0	04/07/2017	Hanna-Kaisa Saari (AV)	FINAL VERSION TO BE SUBMITTED

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List of Acronyms

Abbreviation / acronym	Description
AV	Aerospace Valley
DXT	Diginext
HD	High Definition
ID	Intellectual Disability
ITC	Industrial Training Case
KPI	Key Performance Indicator
LA	Learning Action
LG	Learning Goal
LM	Learning Material
M	Month
PA	Platform Agent
PC	Personal Computer
SLA	Smart Learning Atom
SME	Small and Medium Enterprise
WP	Work Package

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 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 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).

MaTHiSiS is a 36 month long project co-funded by the European Commission Horizon 2020 Programme (H2020-ICT-2015), under Grant Agreement No. 687772.

Executive Summary

This deliverable reports the driver pilot phase of the MaTHiSiS Industrial Training Case (ITC). During this phase, the pilot that validates the MaTHiSiS Platform at the pilot premises with the different stakeholders, run under the total supervision of the MaTHiSiS consortium.

The pilot in industrial training has been carried out by Aerospace Valley (AV) with the technical support of Diginext (DXT). The stakeholder selected for the validation is IDGEO, a specialized professional training company that trains employees (18-65 years old) from different companies in the use of space data for the development of new products and services.

The preparation activities of the driver pilot include the:

- Identification of the training programme: use of Terrahub platform.
- Selection of the tutors and learners that will participate in the pilot: 1 tutor from IDGEO and 9 learners from 4 different companies (24-42 age)
- Selection of the MaTHiSiS Platform agents to be used: a Kinect 2 sensor with a specific Laptop (CORE i7, Windows 10) and 8 HD webcams.
- Identification of the venue and planning of the scenario: The driver pilot takes place in three different phases 1) Remote individual training phase in AV premises; 2) Physical individual training phase in the IDGEO classroom; 3) Physical team training phase in the same IDGEO classroom.
- Design and development of the learning experience process, with its learning goals and learning materials.
- Tutor training

The pilot that trains the learners in the use of TerraHub platform was executed in three phases during June 2017:

- Sub-phase 1: Kinect 2 sensor with the laptop in AV premises (5 individual sessions)
- Sub-phase 2: Kinect 2 sensor with laptop in IDGEO training room (9 individual sessions)
- Sub-phase 3: Kinect 2 sensor with laptop and 8 PC with HD webcam in IDGEO training room (1 team session of 9 people)

The evaluation activities were conducted in parallel with the driver pilots' sessions. The evaluation approach is based on the framework defined in "D2.5 Evaluation Strategy". The MaTHiSiS Platform was successfully demonstrated in the 3 sub-phases by the tutor and learners, with minor internet connection, technical and organisational problems. The pedagogical objective of the ITC training, which was the use of TerraHub platform independently in order to develop services and products using space and geomatic data, was reached.

1. Introduction

The main objective of this deliverable is to explain the preparation, execution and the evaluation of the Industrial Training Case Driver Pilot.

This document is divided into the following sections:

1. Introduction of the ITC.
2. Description of the preparation phase with the selection and engagement of the stakeholder and the training programme and the creation of the related Learning Goals (LG), Smart Learning Atoms (SLA) and Learning Materials (LM).
3. Description of the ITC Driver Pilot execution.
4. Description and results of the ITC Driver Pilot evaluation.
5. Conclusions including recommendations for the Assisted Pilot phase.

2. Industrial training Case (ITC)

1.1 Brief Description of ITC

In the industrial training case, all types of learners will be addressed, although most of them will be adults aged 18-65, industrial workers without major disabilities or learning impairments, thus mirroring the overall industrial European workforce as it stands today. Learners will be trained to use TerraHub, a tool aiming at collecting, processing, and using space and geomatic data. Geomatic is a discipline of gathering, storing, processing, and delivering geographic information or spatially referenced information. TerraHUB is based on an existing off-the-shelf open source software called geOrchestra enriched with specific modules. The basic features provided by the platform are the following:

- Manage data and metadata from several external sources (storage, backup, updating)
- Ingest and publish data and metadata thanks to harvesting operations, visualization and extraction tools.
- Process services thanks to the OGC-WPS feature and based on data stored on the Spatial Data Infrastructure server (raster or vector data).
- Manage security and access rights by assigning rights to users or groups of users.

The objective of the training is to allow learners to use such a platform independently in order to develop services and products using space and geomatic data.

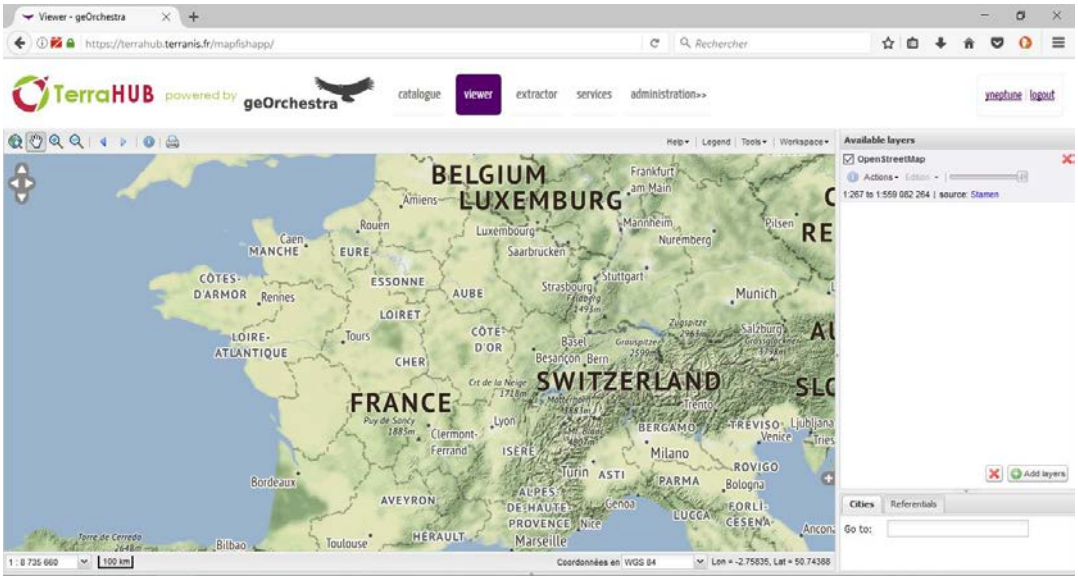

Figure 1: TerraHub Web based platform

1.2 Associated challenges and goals

The industrial training case trainers are expecting to get into training by using new innovative solutions based on new technologies and more specifically on adaptive learning and personalized pedagogy. The existence of such a solution is still limited. MaTHiSiS shall bring a great benefit for trainers and their learning experience in terms of user friendliness and attractiveness of the training materials and contents and in terms also of adaptation of learning process to their knowledge and progress level in order to stimulate the motivation of learners and keep them engaged in the learning process.

3. ICT Pilots Preparation Activities

2.1 Stakeholders and training programme selection

In the preparatory phase of the ITC pilot, interviews were conducted with 3 different companies: Company A, Company B and IDGEO (see D2.2). Companies A and B have been anonymized as they later declined to participate in the project. The company IDGEO, selected to the MaTHiSiS pilot, is a French SME with a core business to provide different types of training (remote, physical, team, individual, short and long term). The training in the use of the TerraHub platform, provided by IDGEO will be integrated in the MaTHiSiS Driver Pilot. As the TerraHub platform is under development IDGEO finds interesting the idea of including is training programme in MaTHiSiS.

2.2 User and system requirements elicitation phase

The user requirements analysis made with IDGEO has allowed the identification of a group of target learners as adults aged 18-65 working in the industrial sector and more generally participating in the European workforce (D2.2). Most of them are non-diagnosed adults. One of the main aspects is the importance of providing new training solutions, using IT to bring added-value to existing training methods without replacing trainers and without requiring additional effort, so that training is in turn more interactive, attractive and efficient.

Regarding the technical aspect of the user requirements, IDGEO was interested in working with their own content, partly developed and digitalized, and therefore they asked the platform to be able to reuse content in existing formats (.ppt, .pdf, .mp4, etc.). Compatibility of the platform with a large variety of brands of platform agents and with already established LMS is as a key advantage.

The physical environment in which the pilot is organized at IDGEO will rather be a classical one: 'in-class' training paired up with 'remote training sessions' and 'out of training session modules' using PCs, laptops or mobiles. The possibility to organize remote sessions and to develop pedagogical modules to be used on personal devices out of the training session has also been emphasized.

2.3 Development of Learning goals, Smart Learning Atoms, Learning Materials

After having identifying the user and system requirements and selecting the training to be integrated in the ITC Driver Pilot, the LGs and SLAs were characterised (see Table 2) and created with the Learning content editor (see Figures 2-7) and integrated to the MaTHiSiS Platform by the technical partners (DXT, CERTH) and the piloting partners (AV, IDGEO). 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.

Learning Goal (LG)	Smart Learning Atom (SLA)	Weight	Learning Action (LA)	Learning Materials (LM)	Platform Agent (PA)	ITC Driver Pilot Phases
LG0: GIS data first level knowledge skills	1. GIS data first level knowledge skills	0,7	1.Read the short document	1. PDF document	Laptop	Phase 1 – remote pre training
			2.Pass the quiz1	2. Quiz1		
LG1: Understanding what the training is about	1. Understanding what the training is about	0,5	1.Watch the video presenting TerraHub	3. You Tube Video		
			2.Pass the quiz2	4. Quiz2		
LG2: Geo-data sets search	1. TerraHub search	0,6	1.Access to the TerraHub web platform (login)	5. TerraHub platform	Laptop + 8 PC	Phase 2 – physical individual training
			2.Access the catalogue module			
			3.Make a key word based query (example climate change)			
			4.Re-define the search (example reduced the search to La Reunion)			
			5.Read the metadata (give information about the quality of the dataset)			
	2. Web dataset search	0,9	1.Make a keyword based data search on the Web	6. Web research page (Google, Qwant, Yahoo...)		
			2.Know international web geodata portals			
	3. Search information from the data sets	1	1.Know how to filter datasets with specific characters			
	4. Download data sets	1	1.Knowhow to download data sets			

Learning Goal (LG)	Smart Learning Atom (SLA)	Weight	Learning Action	Learning Materials (LM)	Platform Agent (PA)	Driver Pilot Phase
LG3: Skills to visualise and manipulate of data	1. Know how to visualize and navigate on the data in TerraHub	0,5	1.Follow the simple exercise (add data sets, zoom in/out, zoom the layer)	5. TerraHub platform	Laptop + 8 PC	Phase 3 – physical team training
	2. Know how to visualize and display attributes on the data in TerraHub	0,6	1.Identify tool to search information form a feature			
			2.Open the attribute table			
			3.Navigate on the attribute table			
	3. Know how works the layers manager	0,7	1 Manage the order of the layers			
			2.Understand the options related to a layer			
	4. Know how works the style manager	0,8	1. Modify the style of the layer			
			2.Export style layer			
			3.Import style layer			
	5. Know how work the query manager	0,9	1.Make the SQL queries			
			2.Display features using queries			
	6. Know how to edit data	1	1.Modify geometry of the data			
			2.Draw new features on the data			
			3.Modify attributes on the table			

Learning Goal (LG)	Smart Learning Atom (SLA)	Weight	Learning Action	Learning Materials (LM)	Platform Agent (PA)	Driver Pilot Phase
LG4: Skill to import data	1. Know how to import vector and raster data sets	0,8	1. Follow the presentation	6. TerraLOADER	Laptop + 8 PC	Phase 3 – physical team training
			2.Understand the Workspace and store definitions			
			3.Follow the presentation of the process to import data sets with Terraloader			
			4.Prepare the importation of vector data sets			
			5.Prepare the importation of the raster data sets			
	2. Know how to edit metadata	0,9	1.Follow the presentation how to edit metadata			
			2. Edit metadata for each data sets to be imported			
			3.Run the Importation			
	3. View the result in TerraHub	0,9	1.View the data sets imported in the TerraHub and play with them	5. TerraHub platform		

Learning Goal (LG)	Smart Learning Atom (SLA)	Weight	Learning Action	Learning Materials (LM)	Platform Agent (PA)	Driver Pilot Phase
LG5: Skills to make the web services publication	1. Know what is a web map service and how to get a first web map service from TerraHub	0,8	1.Follow the presentation of Web Map Services	5. TerraHub platform	Laptop + 8 PC	Phase 3 – physical team training
			2.Get the WebMapServices from the Datasets imported (or other data sets)			
			3.Follow the presentation of the other Web Services and How to publish them (and why)			
	2. Know how to exploit Web services	0,9	1.Follow the presentation of QGIS and how to add a web service	7. QGIS (SW on laptop/PC)	Laptop + 8 PC, Mobile	
			2.Add WMS layer done in the previous action			
			3.Follow the presentation of the plugin QGIS Cloud			
			4.Create a mobile web map			
			5.Visualise the map on mobile	8. Mobile		

Table 2: ITC Driver Pilot LG, SLA and LM

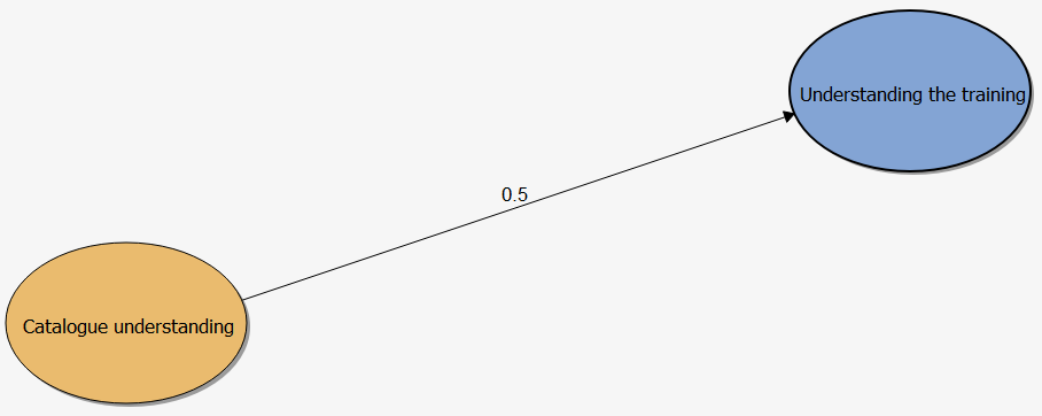

Figure 2: LG0 of the ITC Driver Pilot

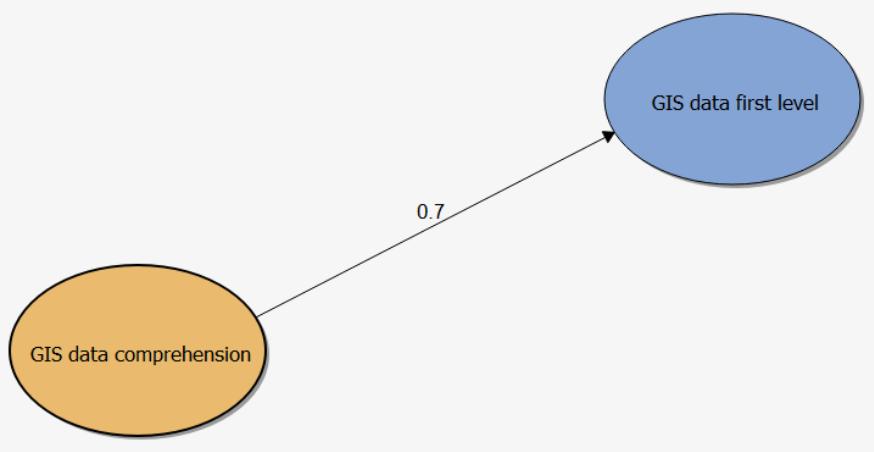

Figure 3: LG1 of the ITC Driver Pilot

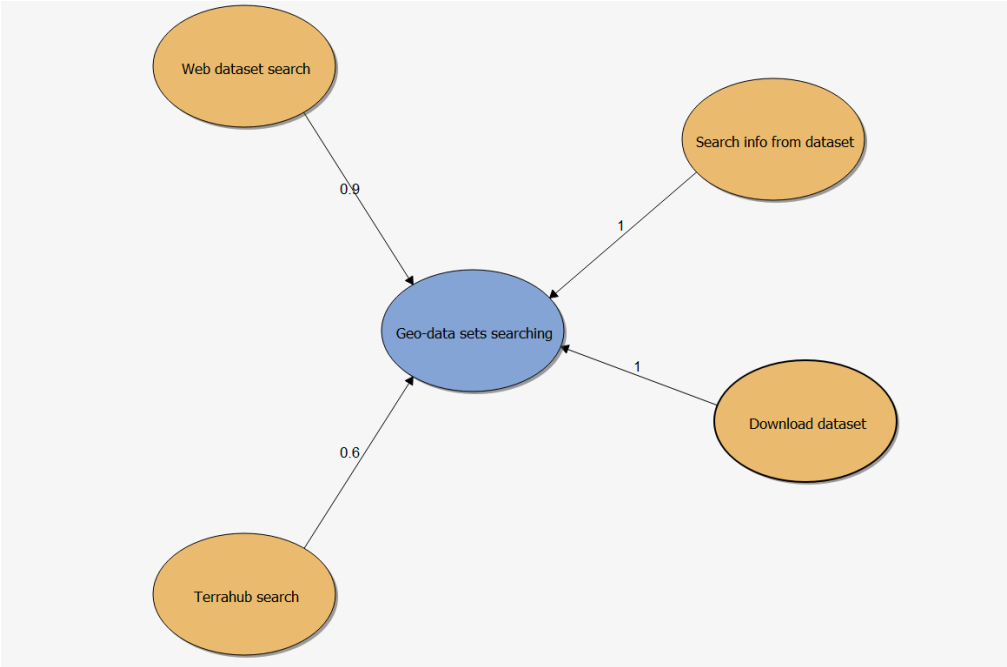

Figure 4: LG2 of the ITC Driver Pilot

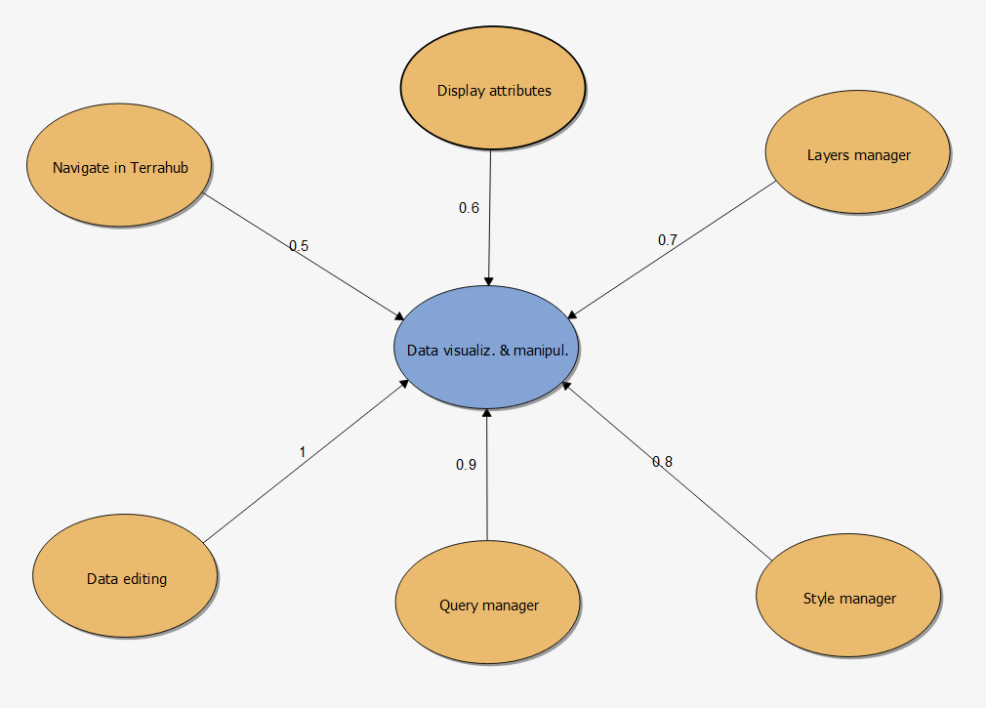

Figure 5: LG3 of the ITC Driver Pilot

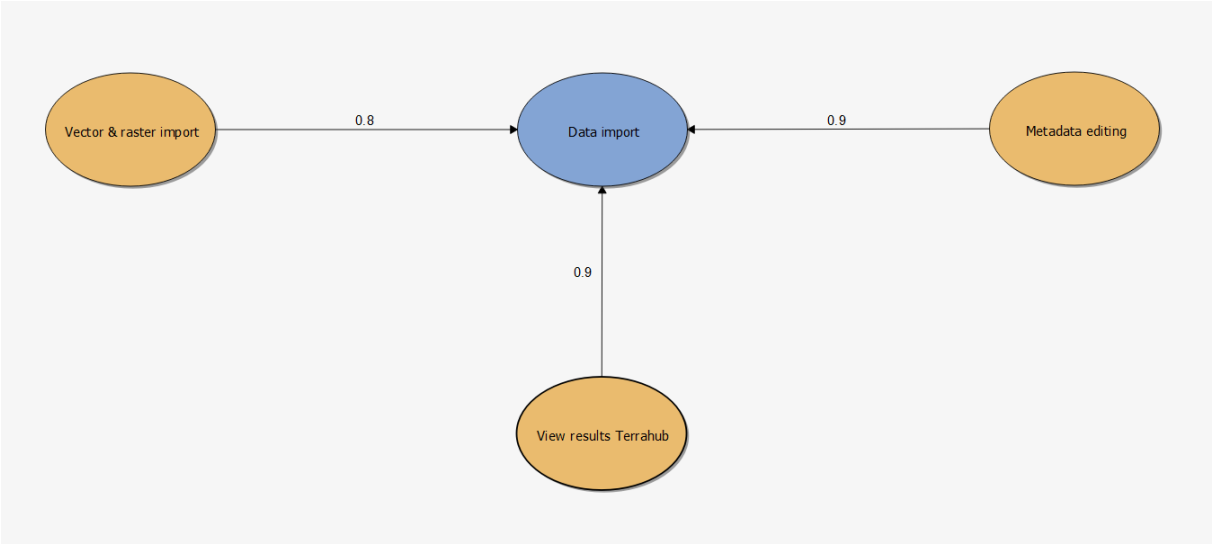

Figure 6: LG4 of the ITC Driver Pilot

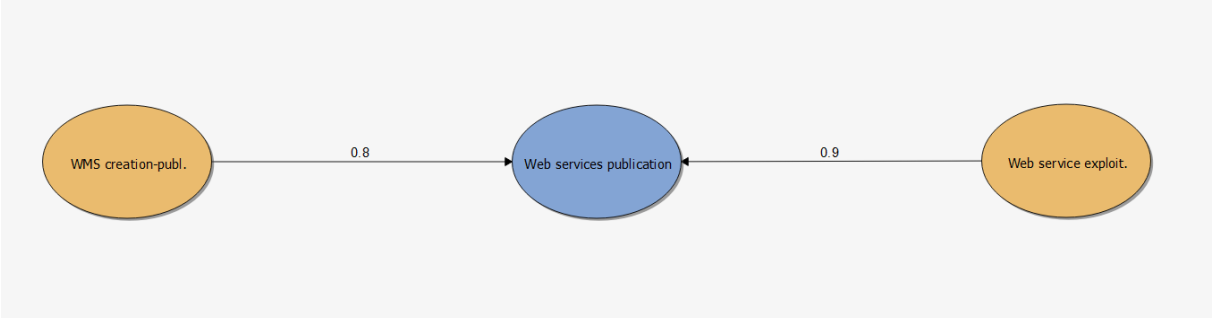

Figure 7: LG5 of the ITC Driver Pilot

2.4 Platform agents and physical settings for the Driver Pilot

The PAs that were selected to be used in the ITC Driver Pilot were adapted to the defined training scenario. In order to test MaTHiSiS Platform, a Kinect 2 sensor with a specific Laptop (CORE i7, Windows 10) and 8 HD webcams were purchased. The system was tested several times individually with the Kinect 2 Sensor (ITC Driver Pilot sub-phase 1 and 2) and also, different learner sessions were launched and executed simultaneously (ITC Driver Pilot sub-phase 3).

2.5 Driver Pilot scenario and planning

In order to test several configurations of the MaTHiSiS Platform during the Driver Pilot phase, the ITC pilot was divided in three separated sub phases:

1. **Remote individual training sub-phase:** aims at guarantying, before entering the main training, that the learners have the required knowledge level for the training and that the leaners understand the content of the training they will follow. This phase is executed with LG0 and LG1 and is ideally done remotely by each learner whenever, wherever is convenient for him using the platform agent PC, laptop or Mobile Phone.
2. **Physical individual training sub-phase:** aims at training the learners about the basic information of the TerraHub platform in order to give the first level information about it and increase the curiosity and the motivation of the learners to know more. This phase is executed with the LG2 and carried out individually during the Driver Pilot phase in order to maximize the individual training executed with the Kinect 2 sensor.
3. **Physical team training sub-phase:** aims at training all the learners together to search, visualize, manipulate and import/export Geodata and how to publish geoformation based web services with the manipulated data. This team training made in a classroom, corresponds to the classical TerraHub training settings, organized without MaTHiSiS configurations.

2.6 Setting of the venues

The sessions have been organized in the following locations:

1. **Remote individual training phase** was organized in AV premises instead of remotely by the learners themselves, as the technical partners requested to have as many as possible sessions with the Kinect sensor and as the installation of the Experiencing Service v1.9, (mandatory to use the MaTHiSiS platform) to the PA of all learners (Mobile/laptop/PC) was not feasible either (mandatory to have Windows 8 or 10 in the PA). The Kinect 2 sensor and its Laptop were installed on a specific desk. The Laptop was connected to the AV wired internet connection.
2. **Physical individual training phase** was organized in the IDGEO classroom dedicated to train up to 9 trainers. The Kinect 2 sensor and its Laptop were installed and connected to the IDGEO wired internet connection.
3. **Physical team training phase** was also organized in the same IDGEO classroom with the Kinect 2 sensor and its Laptop and eight PCs with the HD Webcam and wired internet connection.

2.7 Tutor training

Before the Driver Pilot took place, the tutor was trained by the technical partner (DXT) in the use of the MaTHiSiS Platform. The Learning content editor was presented as well, but the tutor was not yet trained to use it as in this phase of the pilots, it was not planned that the tutors create learning graphs.

3. ITC Driver Pilot deployment and execution

This section explains in detail the ITC Driver Pilot deployment and execution.

3.1 MaTHiSiS project pilots phases

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:

1. Driver Pilots, which ran in June 2017: This pilot ran with assistance from the MaTHiSiS consortium. People at the venue setup and configured the system under MaTHiSiS consortium guidance following a training.
2. Assisted Pilots that will run in November 2017: based on the evaluation results of Driver Pilot outcome, leading to the refinement of components and system level technology consolidation, an enhanced version of the MaTHiSiS platform will be tested during this phase.
3. 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.

3.2 ITC Driver Pilot fact sheet

Below is presented a summary factsheet of the ITC Driver Pilot execution.

Organisation Name	AV, IDGEO, DXT
Period of the sessions	14th, 19th and 20th June 2017
Number of sessions	Sub-phase 1: 5 individual sessions Sub-phase 2: 9 individual sessions Sub-phase 3: 1 team session of 9 people
Description of physical environment	Sub-phase 1: Kinect 2 sensor with the laptop in AV premises (5 individual sessions) Sub-phase 2: Kinect 2 sensor with laptop in IDGEO training room (9 individual sessions) Sub-phase 3: Kinect 2 sensor with laptop and 8 PC with HD webcam in IDGEO training room (1 team session)
Description of social environment	9 working adults aged between 24 and 42 from 4 different companies were trained to use the TerraHub platform.
Description of learning environment	French City, IDGEO classroom
Teachers involved (number and subjects)	1 teacher from IDGEO
Learners involved (number, age, peculiar condition, diagnosis or educational needs)	9 learners, 24-42 age, without disabilities or learning problems, different level of skills in GIS applications.
Number of LG created	5
Number of SLA created	17
Number of LM created	5

Table 3: ITC Driver Pilot Fact Sheet

3.2.1 Learners programme and user account creation and protection of personal information

The three sub-phases ITC pilot programme were organized with a specific excel planning table (see section 6.1). For each trainer, a specific pseudo name was created to protect his personnel data. This pseudo name was used to create the user accounts in the MaTHiSiS Platform. All 9 learners were informed about the pilot experimentation and its research aspects and asked to sign specific consents form before entering the training.

3.2.2 Remote individual training sub-phase

The remote individual training sub-phase was organized in AV premises on 14th June 2017 between 9:00 and 17:00, 5 days before the physical training phase. Technical partner DXT installed with AV the required devices into the training venue. The learners received in advance from IDGEO the documents related to the LG0 and LG1 as well as the link to the YouTube video about the LG1. These LMs were sent in advanced to the learners as it was not guaranteed that the MaTHiSiS Platform could show them during the pilot. The learners came to the Kinect 2 sensor one by one and their learner accounts were launched for LG0 and LG1. For the first learner the MaTHiSiS Platform did not worked with the AV wired internet connection. There are two possible reasons for it: (1) too high security protocols or (2) too slow internet connection. The Kinect 2 sensor laptop was therefore connected either to the Mobile 4G connection or AV individual Wi-Fi connection. Those both connections worked well. After the first learner passing correctly through the first Quiz1 related to the LG0 the Learner 1 should passed through the MaTHiSiS Platform to the LG1. The LG1 did not work correctly as the LMs of the LG1 were integrated mistakenly in the LG2 and this was noticed only after the training. Thus, the pedagogical validation of the LG1/Quiz2 was made by by all Learners through direct web link without MaTHiSiS Platform. The emotional face recognition by the Kinect 2 worked and showed all the three emotional stages for the learners: Frustrated, Bored, Engaged. Four of the 9 learners were not able to finally come to make this phase and the LG0 and LG1 in AV premises, due to the problems of timing or geographical distances and therefore those learners made the Quiz1 and 2 with the web based links without interaction with the MaTHiSiS Platform: http://81.171.11.177/lm/lm_quizz_SIG/; http://81.171.11.177/lm/lm_quizz_terrahub/

3.2.3 Physical individual training sub-phase

The physical individual training was organized in IDGEO premises on 19th June 9:00-18:00. The Kinect 2 sensor laptop was connected to the IDGEO wired internet connection which worked perfectly with the MaTHiSiS Platform. All 9 learners came one by one to the Kinect 2 sensor laptop to follow the training related to the LG2. IDGEO presented the training using a Power Point presentation in a separated screen and the LG2 and its related LM, TerraHub web based platform, were launched by the IDGEO tutor on the MaTHiSiS Platform. All individual training sessions were launched and executed correctly for all 9 learners. The emotional face recognition by the Kinect 2 worked and showed all the three emotional stages for the learners.

3.2.4 Physical team training sub-phase

The physical team training was organized in IDGEO premises on 20th June 9:00-13:00. The Kinect 2 sensor laptop and the 8 PC with the HD Web cams were connected to the IDGEO wired internet connection. The connection was working well with the MaTHiSiS Platform, besides ones, when all connections were cut off for 30 minutes without identifying a specific reason for it. Windows 10 was installed to the all 8 PCs as the Experiencing Service v1.9 was not working with the Windows 7 even if the PCs were not using Kinect. The LG3, LG4 and LG5 were all launched successfully simultaneously for 9 learner profiles on the MaTHiSiS Platform. The related LM worked only for the LG4 as the other LMs (TerraLOADER and QGIS) were not identified by the technical partners as LMs and therefore there was not enough time to upload them correctly to the MaTHiSiS Platform before the training.

The emotional face recognition by the Kinect 2 worked and showed the three emotional stages for the learners.

4. ITC Driver Pilot Evaluation

The objective of the evaluation of ITC Driver Pilot was to evaluate the platform functionalities, and provide recommendations for the improvement of the MaTHiSiS platform and the execution of the assisted pilot phase. The evaluation processes defined in the D2.5 were translated into a web based questionnaire survey by https://www.qualtrics.com/. Two different surveys were created:

one for tutor: https://ntupsychology.eu.qualtrics.com/jfe/form/SV_diMUWwLPtFQr9uB

and one for learners: https://ntupsychology.eu.qualtrics.com/jfe/form/SV_5BhS5jEajHUpm0B

The questions prepared in the D2.5 for the Driver Pilot weere not finally coherent for the Driver Pilot evaluation as the interaction with the platform was not fully functional. Therefore the survey was adapted to the current situation.

Two tutors (one from DXT and one from IDGEO) and 10 learners (9 trained learners and 1 not trained learner) answered to the survey.

4.1 KPI#1 Usability

KPI#1 for usability measures the quality of fit (of MaTHiSiS) in the educational purpose it 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 (trainee or trainers) to actively see MaTHiSiS as a useful and functional tool.

4.1.1 Tutors

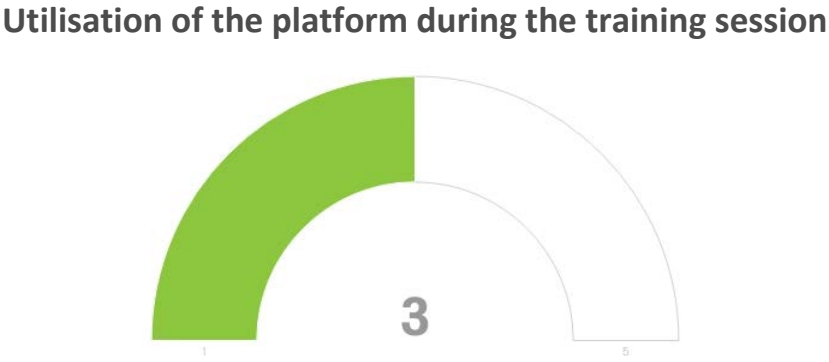

Figure 8: Tutor evaluation result of the utilisation of the platform during the training session (1=Bad, 2=Poor, 3=Medium, 4=Good, 5=Excellent)

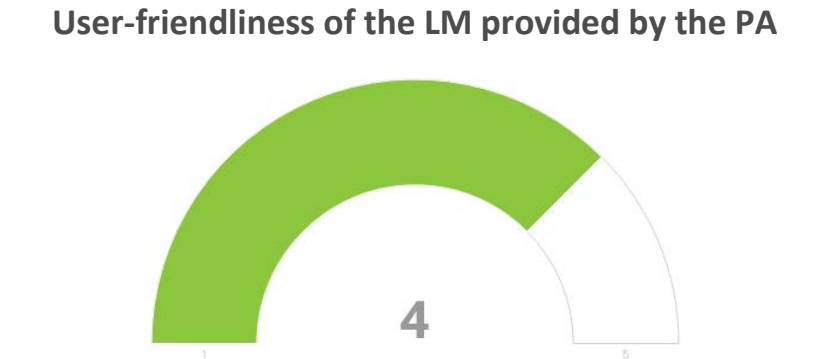

Figure 9: Tutor evaluation result of the user-friendliness of the LM provided by the PA (1=Bad, 2=Poor, 3=Medium, 4=Good, 5=Excellent)

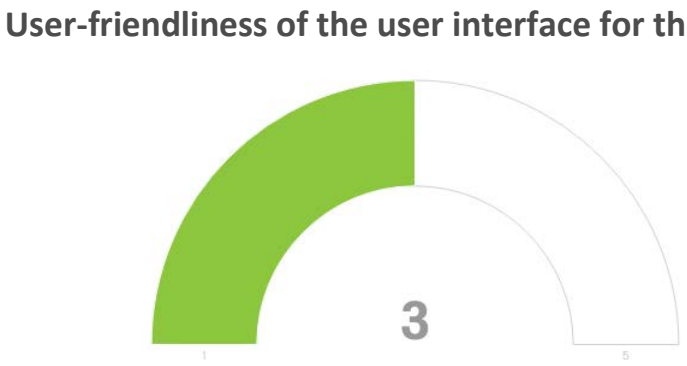

Figure 10: Tutor evaluation result of the user-friendliness of the user interface for the trainee (1=Bad, 2=Poor, 3=Medium, 4=Good, 5=Excellent)

How many errors and bugs during the training session?

Number	Answers
0	0
1-5	2
6-10	0
11-15	0
16-20	0

Table 4: Tutor evaluation result of the numbers of errors and bugs during the training session

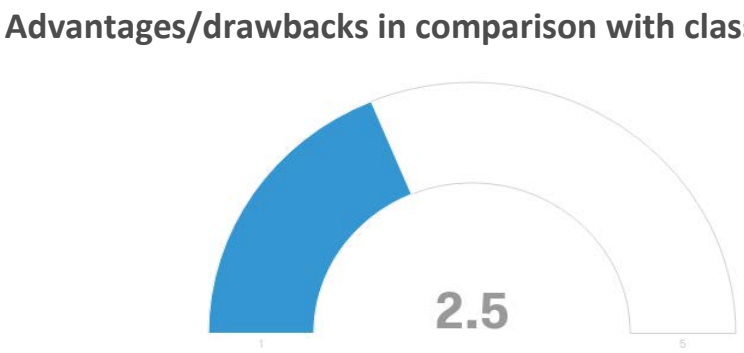

Figure 11: Tutor evaluation result of the advantages/drawbacks in comparison with classical training (1=Bad, 2=Poor, 3=Medium, 4=Good, 5=Excellent)

The advantages and drawbacks of the MaTHiSiS platform in comparison with classical training during the driver pilot phase was evaluated by Tutors between poor and medium. This is mostly due to the fact that all functionalities of the MaTHiSiS platform were not used during this pilot phase as it was not technical yes feasible. Therefore the fully capacities and the added value the platform can bring was not clearly demonstrated. Despite of this fact the tutors are convinced about the possible added

value of MaTHiSiS and stayed enthusiastic to explore again the MatHiSiS Platform during the Assisted Pilot phase.

How many confusion/misunderstandings induced by the platform during the training?

Number	Answers
0	1 (DXT)
1-5	1 (IDGEO)
6-10	0
11-15	0
16-20	0

Table 5: Tutor evaluation result of the numbers of confusion/misunderstandings induced by the platform during the training

How much time was taken to set up SLAs?

IDGEO	Several hours as the definition of how should it work was not clear
DXT	4h

Table 6: Tutor evaluation result of the time took to set up the SLAs

How much time was taken to set up the Learning Graphs?

IDGEO	Several hours as the definition of how should it work was not clear
DXT	2h

Table 7: Tutor evaluation result of the time took to set up the LGs

4.1.2 Learners

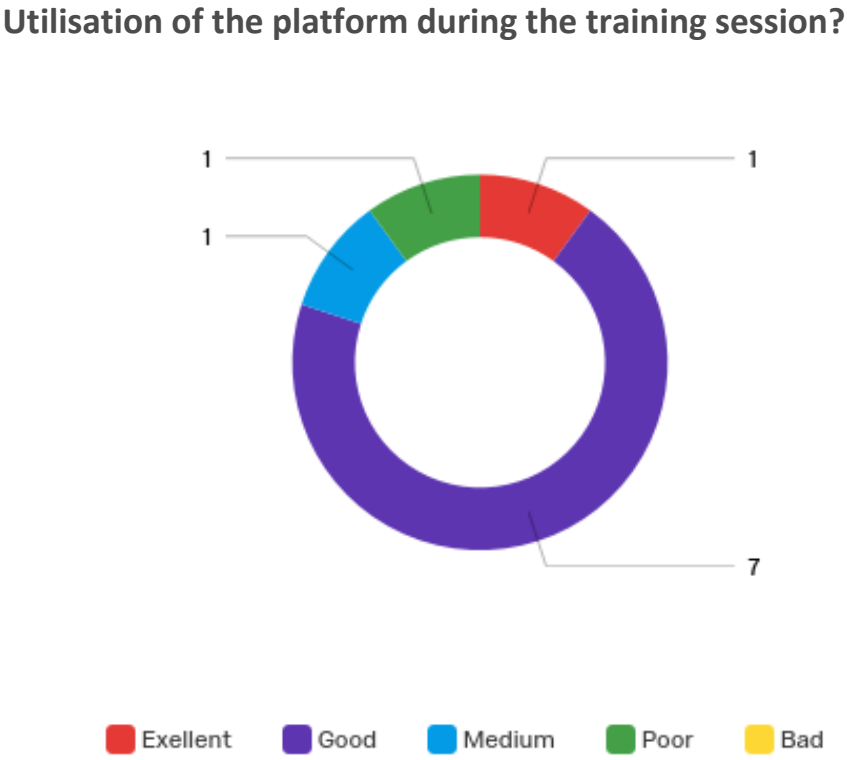

Figure 12: Learner evaluation result of the utilisation of the platform during the training session

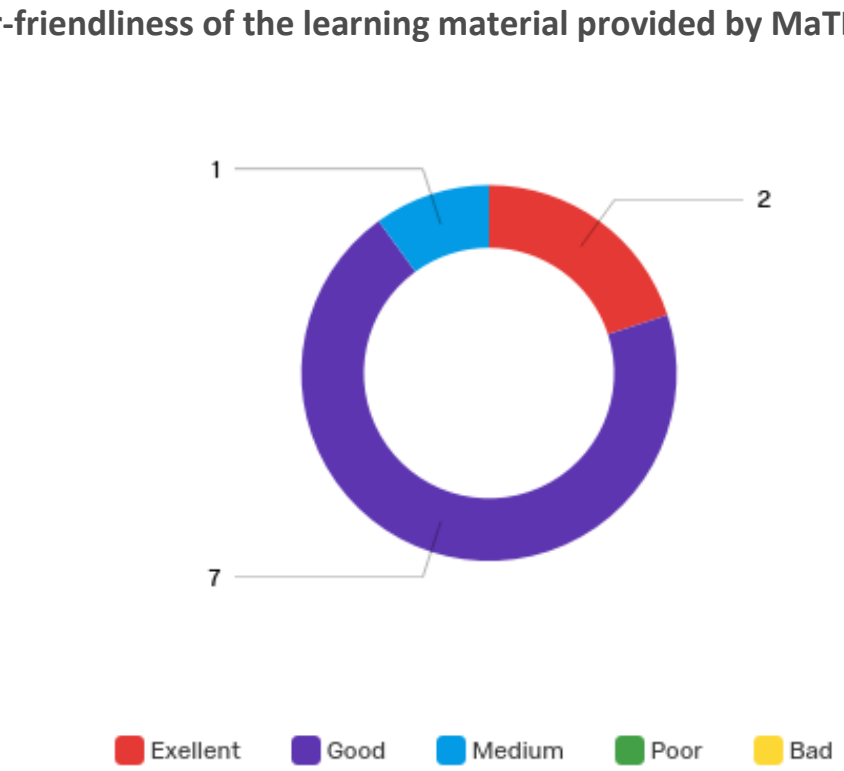

Figure 13: Learner evaluation result of the user-friendliness of the learning materiel provided by the MaTHiSiS

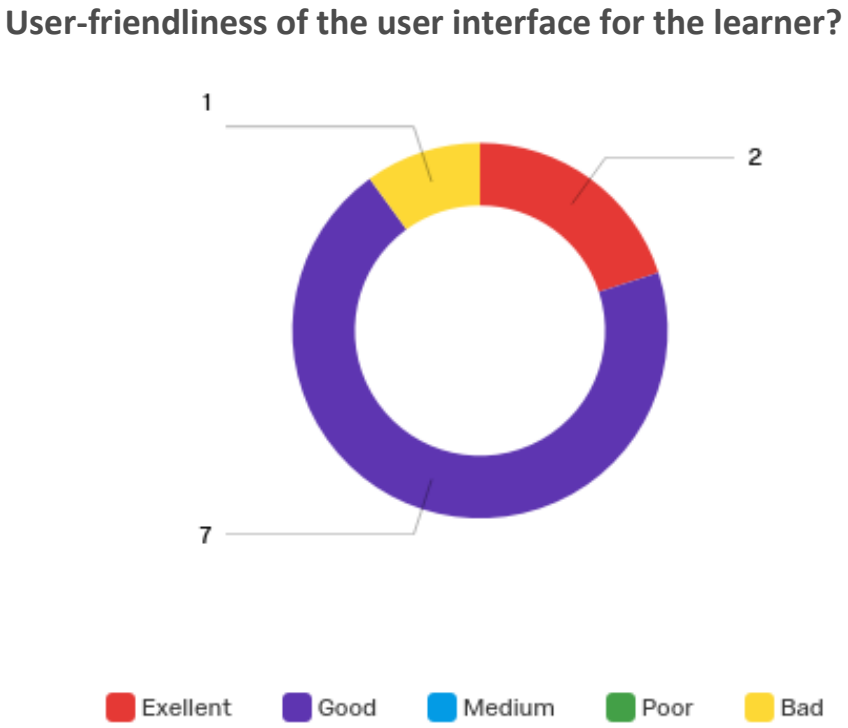

Figure 14: Learner evaluation result of the user-friendliness of the user interface for the learner

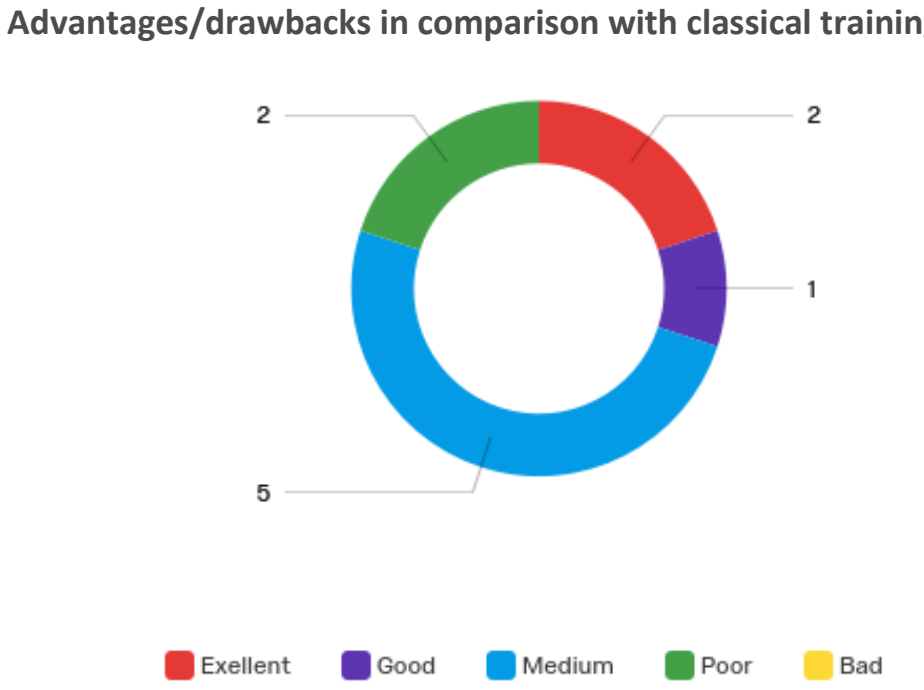

Figure 15: Learner evaluation result of the advantages/drawbacks in comparison with classical training

Even though the MaTHiSiS Platfrom full technical capacities were not able to be tested and showcased during the Driver Pilot Phase most of the learners (8 amongst 10) thought it bringing an added value in comparison with classical training. The learners were very enthusiastic during all three training phases to take part in new high technological test trial which increased their motivation and engagement during the training. Thus the classical training itself was felt as well more ludic, interactive and attractive.

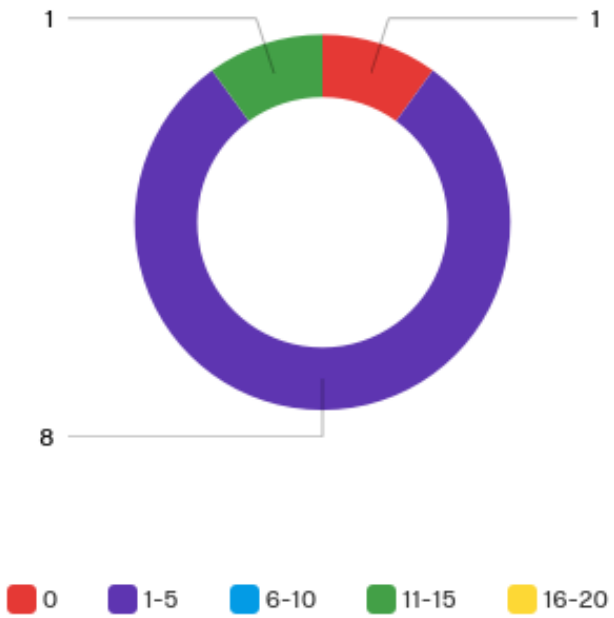

Figure 16: Learner evaluation result of the how many confusion/misunderstandings induced by the platform during the training

4.2 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.

Number of SLAs created?

IDGEO	15
DXT	13

Table 8: Tutor evaluation result of the number of SLAs created

Number of SLAs used?

IDGEO	5
DXT	5

Table 9: Tutor evaluation result of the number of SLAs used

Number of SLAs created/used that could be used for another Learning Goals?

IDGEO	0
DXT	0

Table 10: Tutor evaluation result of the number of SLAs created/used that could be used for another Learning Goals

Number of SLA created/used that could be used for another training?

IDGEO	0
DXT	0

Table 11: Tutor evaluation result of the number of SLA created/used that could be used for another training

4.3 KPI#3 Accessibility

KPI#4 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.

Number of PAs used by the MATHISIS platform? = 9

Other PAs that could have been used for the training?

IDGEO	Mobile
DXT	0

Table 12: Tutor evaluation result of the other PAs that could have been used for the training

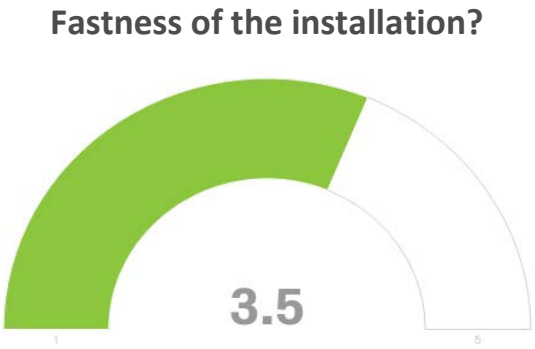

Figure 17: Tutor evaluation result of the fastness of the installation (1=Bad, 2=Poor, 3=Medium, 4=Good, 5=Excellent)

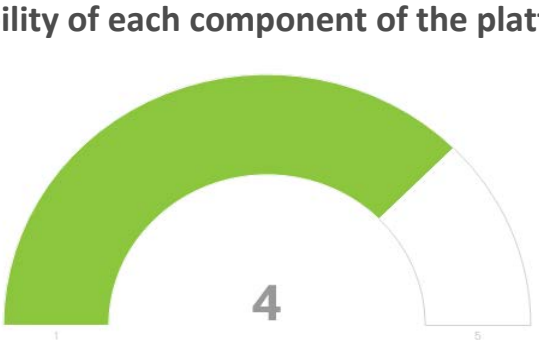

Figure 18: Tutor evaluation result of the reliability of each component of the platform (1=Bad, 2=Poor, 3=Medium, 4=Good, 5=Excellent)

4.4 Improvements to be made for the Assisted Pilot

The conclusion of the evaluation results are explained in the section 5 of this deliverable. Below the written feedback received from learners and tutors for the improvements to be made for the Assisted Pilot phase, is illustrated.

Tutor Feedback 1: Possibility to make training remotely, several LMs, validation of each SLA

Tutor Feedback 2: 1. Some of the SLAs were unused because of the flow of the Learning Scenarios (sequence of exercises)

Learner Feedback 1: From a user point of view, I consider that the limitation of three moods "engaged", "frustrating" and "boring" do not enough reflect the user experience. Besides, I was sometimes boring while it was written "engaged" and "frustrating" when I was engaged. Also, I think the window with line codes reminds too much, to the user, that he/she is the "object" of an experience or something alike. It could be good if the user could see his state "engaged", "boring" or "frustrating" via a graphical user interface.

Learner Feedback 2: More interactions between the learning materials and the MATHISIS platform, more use of the MATHISIS platform in the training session

5. Conclusion

The ITC Driver Pilot was organised in three phases on 14th, 19th and 20th June 2017 in AV and IDGEO premises. Nine learners and 1 tutor were participating in the pilot. Nine different PAs were used and 5 LGs, 17 related SLAs and 5 LMs were created. The usage of the MaTHiSiS Platform by the tutor was smooth and easy. The MaTHiSiS Platform was successfully used in the 3 sub-phases by the tutor and learners, with minor internet connection, technical and organisational problems. The pedagogical objective of the ITC training, usage of TerraHub Platform independently in order to develop services and products using space and geomatic data, was reached.

The learners and the tutor were very enthusiastic and keen to participate in the pilot. This enthusiasm lasted during the whole pilot and most of the learners expressed their willingness to go on with the experimentation. The tutor was very interested in the concept of MaTHiSiS and was looking forward to see the MaTHiSiS platform running with all the functionalities in place, although he found the organisation of the pilot rather complicated.

For the assisted pilot, the internet connection of the AV premises shall be verified, to know if the malfunctioning comes from the security protocol or from the quality of the connection and relevant technical measures shall be took into consideration by the MaTHiSiS technical partners. The LG0 and LG1 remote individual training phase, should be able to be organized remotely in the assisted pilot with the learners' own mobile phone/laptop/PC and all related LMs (pdf and video) should be able to be launched directly with the related LGs and SLAs. Physical individual training LG2 in the assisted pilots should be able to be organized with all learners together same time in the classroom. The end of the LG5 shall be able to execute with the Mobile PA. The training should be able to reconstruct in the nonlinear manner that the SLAs could be able to be reused in higher level learning goals.

The results of this document will be used as an input for the organization of the ITC assisted pilot phase.

6. Annexes

6.1 ITC Driver Pilot Training programme

MatHiSiS ITC Driver Pilot									
14/06/17									
1. Remote individual training sub-phase									
PSEUDO formation	**9h00-10h00**	**10h00-11h00**	**11h00-12h00**	**12h00-13h00**	**14h00-15h00**	**15h00-16h00**	**16h00-17h00**	**17h00-18h00**	**18h00 - 19h00**
MARS			x						
VENUS	x								
MOON		x							
SATURN					x				
PLUTON								remotly	
URANUS									x
EARTH							remotly		
JUPITER	Bordeux								
NEPTUNE	Bordeux								
19/06/17									
2. Physical individual training sub-phase									
PSEUDO formation	**9h00-10h00**	**10h00-11h00**	**11h00-12h00**	**12h00-13h00**	**14h00-15h00**	**15h00-16h00**	**16h00-17h00**	**17h00-18h00**	
MARS			x						
VENUS					x				
MOON				x					
SATURN						x			
PLUTON							x		
URANUS								x	
EARTH	x								
JUPITER		x							
NEPTUNE		x							
20/06/17									
3. Physical team training sub-phase									
PSEUDO formation	**9h00-12h00**								
MARS	x								
VENUS	x								
MOON	x								
SATURN	x								
PLUTON	x								
URANUS	x								
EARTH	x								
JUPITER	x								
NEPTUNE	x								

7. References

1. Scriven, Michael. "Beyond Formative and Summative Evaluation." In In M.W. McLaughlin and ED.C. Phillips, eds., Evaluation and Education: A Quarter Century. Chicago: University of Chicago Press, 1991.
2. NTU (ed.), "D2.2 Full scenario of all use cases" Deliverable of the MaTHiSiS project, 2016.
3. NTU (ed.), “D2.5 Evaluation Strategy” Deliverable of the MaTHiSiS project, 2017