Intellectual Output 2-Task 4

A complete report of a methodological approach for SEN teacher training

CONSORTIUM

This document has been produced by the consortium of the INTELed project

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Executive Summary

This document presents the training methodology for SEN teachers, based on the pedagogical framework described in O1. The report is a compilation of the tasks that have been accomplished during the O2 and it includes:

- The methodological approach for the teacher training, as it was defined in the specification report (T1), with the contribution of all the partners.

- The development of the learning modules and activities that follow the methodology defined in the specifications report (T2)

- The repository of ICT multi-sensory educational resources (T3) and its use during the implementation of the training events and the pilots.

The training methodology specification report is the base for a high quality teacher training, and it includes innovative strategies that will effectively address the objectives of the INTELED project and SEN teachers training.

1. Introduction

The aim of O2 is the development of a methodological framework on ICT tools and multi-sensory techniques for high quality teacher training based on the pedagogical framework of O1. The target audience of the training is in-service special teachers who work in mainstream or special schools. At least 20 teachers from each partner country (total 80) will be engaged in the INTELed training, followed by pilot studies implemented with SEN students (more than 250; 3-4 SEN students per trained SEN teacher) in mainstream and special schools at the partner countries.

The teacher training methodology was approached in three steps, including the specifications, the development of the learning modules and the collection of interactive resources and based on the pedagogical framework of O1. In particular, the first step was to specify a methodological approach and model for SEN teacher training, by sharing the background knowledge of INTELed partners. The second step was the development of the four learning modules, which combine experiential learning, hands-on activities, practical experiences, as well as reflection activities. The third step was the development of technologies toolkit, with ICT-multisensory educational resources and tools, to be used during the SEN teacher training and INTELed school pilots.

The main objectives of the complete report of the methodological approach for SEN teacher training are the following:

- To create a "handbook" for the INTELed model for SEN teacher training.
- To present the learning modules and the assessment activities.

2. The INTELed TPD model definition

The TPD model is applied in a spiral curriculum in order to expand the teachers' knowledge and improve their skill level. To this direction four roles are recognized for the teachers:

(1) Teachers as *learners*: during this stage teachers are introduced to the INTELed's philosophy. In particular, this stage includes teachers' familiarization with the notion of embodied cognition through the use of interactive and multi-sensory techniques for addressing the needs of Special Education (SEN) children. In order for this to be achieved teachers are asked to participate in a sequence of experiential activities, as learners.

(2) Teachers as *teachers*: during this stage teachers will be asked to use the knowledge they obtained in the first step, in order design technology integration scenarios (using the INTELed

repository of multi-sensory technologies) and lesson plans within the framework of embodied cognition for their SEN students. By the end of this stage, teachers will exchange feedback on their lesson plans and integration scenarios. At this point, teachers will be ready to start their pilots.

(3) Teachers as *innovators*: this is the stage where teachers' pilots take place in schools. During this stage, teachers will be asked to enact the INTELed-based learning activities which they will have developed in the previous stage. As such they will have the opportunity to assess the effectiveness of the new pedagogical framework though piloting in authentic school environments and implement the knowledge and skills/competencies they will have previously gained in praxis.

(4) Teachers as *reflective practitioners*: during this stage teachers will be invited to reflect on their pilots as well as to share their experiences with their colleagues. This stage will take place through the online Community of Practice (CoP) and populate the effects of the INTELed methodology.
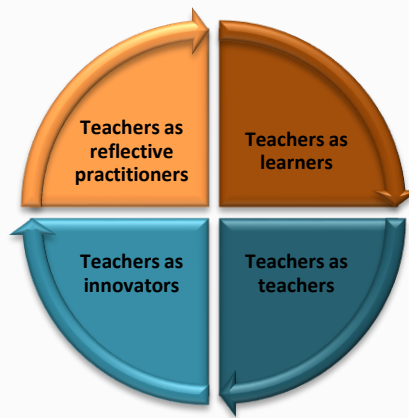

Figure 1. Stages of TPD model

Stage 1 (Teachers as *learners*) and Stage 2 (Teachers as *designers*), which refer to teachers' training and the codesign process will be instructor-led in fully equipped classrooms, so that teachers will be able to familiarize with kinesthetic tools and applications (e.g., Kinect cameras, Leap motions, etc.). Stage 3 (Teachers as innovators) involves the enactment / piloting of teachers in authentic school environments and Stage 4 (Teachers as reflective practitioners), refers to the sharing of experience and will be realized via the INTELed Community if Practice.

The evaluation of the teachers' competence in applying the INTELed method will be implemented with the use of questionnaires, interviews and observation protocols. In particular, pre-post surveys will evaluate the teachers' needs and confidence about the INTELed method, while pre-post interviews will be conducted to evaluate the teachers' implementation of the INTELed method. Finally there will be observation of the pilot activities, focusing on the teachers' competencies.

3. The INTELed teacher training

3.1 Target group profile

The major goal is to provide teachers with the necessary skills that will help them integrate the multisensory/embodied technologies in their educational practices. To achieve that goal, the TPD model proposes a number of activities that are needed in order to engage the teachers in training: reflective learning, creating lesson plans, piloting and sharing experience via a Community of Practice that will be available online and for different national groups of teachers.

The main target audience of the project is **in-service SEN teachers** who work in elementary school with SEN children, such as those diagnosed with autism, dyspraxia, ADHD, emotional disorders and other learning disabilities. The increasing numbers and needs of SEN children urge an ongoing need for training SEN teachers. Teachers must face with different levels of abilities as well as disabilities and sometimes they get in wrong in identifying SEN. They are not prepared for working in diverse classrooms and they are not equipped with confidence, knowledge and skills on the use of modern ICT multi-sensory technology available today, to effectively support and assess SEN children. The main goal will be making teachers able to integrate multi-sensory technologies in their everyday work. At the same time, teachers will be able to manage these new pedagogical resources by themselves and in autonomy so to manage different interventions.

Reports from OECD and EU suggest that teachers should be supported to develop the skills, knowledge and confidence in using ICT in working with SEN children. INTELed builds on the fact that most of the teacher training includes theoretical sessions while practical experiences in authentic school environments with SEN children is almost non-existent in teacher education programs. The use of technology, e.g. interactive multi-sensory tools, such as Kinects, Wii, leap motion, is expected to have great impact in the training of SEN teachers, who rarely get to put such emerging technologies in action during their initial training. Through INTELed, teachers will use technology to expertise in their professional practice.

INTELed's ultimate beneficiary will be **SEN children**, which cover 10% of children population in Europe. Nowadays, classrooms contain an heterogeneous mix of children from different backgrounds and different levels of abilities that does not help SEN children to achieve develop their skills according to their special educational needs. As a result, SEN children have low performances and most of the time they lose interest in the classroom. All this situation makes the need for highly trained teachers imperative. Especially when it comes to SEN students, special teachers should be inevitably highly trained on methods that can help them deliver high quality teaching that addresses their needs. The INTELed's role is to strengthen the professional profile of special teachers, to effectively support and assess SEN children, who will be encouraged to engage in kinaesthetic and

embodied learning activities for the improvement of learning, cognitive, as well as social and emotional performance.

3.2 Objectives of the INTELed training

Up to now several studies have scientifically proved the effectiveness of multisensory practices in education. For children with special needs, this approach is very effective, because of the full engagement of different parts of the brain (visual, auditory and kinesthetic) that makes them more stimulated and engaged, especially when combined with playful and experiential activities.

The aim of the INTELed training is to advance the knowledge of in-service SEN teachers, on the use of multi-sensory technologies in terms of learning and assessment. This will be achieved by building on hands-on experiences rather than on theoretical knowledge.

The INTELed training of in-service SEN teachers will combine modern ICT learning methods and assessment techniques with multi-sensory practices.

The specific objectives of the INTELed training are is enable SEN teachers:

- To understand the INTELed pedagogical framework for promoting embodied learning in inclusive educational settings,
- To distinguish and explain the differences of the INTELed pedagogical framework as compared to other pedagogical frameworks and approaches,
- To analyse existing educative modules for supporting embodied learning in inclusive educational settings,
- To adopt and/or adapt embodied learning activities based on the INTELed pedagogical framework,
- To implement succesfully embodied learning activities in authentic learning environments,
- To evaluate the success of embodied learning activities grounded on the INTELed pedagogical framework in inclusive educational settings,
- To reflect on the challenges of the INTELed pedagogical framework in relation to understanding and implementing the framework.

3.3 Methodologies, tools and assessment

3.3.1 Methodologies

The methodological approach for highly quality teacher training, is based on the pedagogical framework of O1, which is proposing ICT multi-sensory educational resources and the use of a spiral curriculum approach. Within this framework, the following potential methodologies have been proposed by the partners, which align to the INTELed training objectives:

- **Case-based learning**: With case-based teaching, SEN teachers are expected to develop skills in analytical thinking and reflective judgment by being engaged in authentic school scenarios. The method is expected to address the needs of the SEN teachers, because they will be critically engaged with specific circumstances of the use of ICT tools of embodied cognition. The study of various cases will help them to identify problems as they perceive them and thus formulate strategies and generate possible solutions for authentic scenarios.

- **Communities of Practice**: An INTELed online CoP will be developed and it will be initiated by the SEN teachers that will participate at the INTELed training. It is expected that this CoP will promote the interaction and the sharing of information and experiences among the INTELed teachers. As a result through this process it is expected that the CoP members will have the opportunity to learn from each other and to develop personally and professionally.

- **Participatory design**: This bottom-up approach aims to involve the users of a product, in order to maximize the usability and promotes active participation of users in the design phase, as well as in the decisions that will affect them. Re-contextualizing this process in the field of education, participatory design captures the initiatives which place pre- or in-service teachers as active participants in the design, or in the adaptation of learning activities. Participatory design can increase teacher ownership of reform efforts and support educational change, which is the overall goal of the INTELed project. In particular, by participating in the design of a learning activities grounded on the theory of embodied cognition, the INTELed project is expected to allow teachers to design activity sequences which address their SEN students, while also providing teachers with a flexible understanding of the relationship between the embodied cognition theory, the affordances of embodied and multi-sensory technologies, motion-based student activities and desirable learning outcomes.

- **Group discussions**: In the INTELed context, group discussions can be organized to help teachers discuss about their views on the proposed methodology, identify strengths and weaknesses, ideas of how to put it in practice in their classrooms, etc. Discussions can be organized in face to face sessions, but also by asynchronous discussion forums (or an equivalent resource that allows teachers express their opinions and discuss them with others).

3.3.2 Tools

The INTELed training will be technology-based and as a result the use of appropriate tools in the teacher training, is recommended. Our aim is to motivate teachers and facilitate their engagement, by giving them the opportunity to form new skills and competences. Some of the tools that were proposed by the partners are the following:

- **Share files tools**: Cloud-based tools have many including storage facilities to track all transfers. These tools could save the user from the setup, cost and maintenance of running his/her own home server (VPN) and make it easy to upload files to share with friends or colleagues, access remotely (on any device), or store for later. Having all files stored online makes it easy to store, organize, and share them, so the INTELed teachers and trainers can work on documents with teammates, share reports with their colleagues etc. The files are always up to date, so everyone has access to the latest version. These tools will enhance collaboration between the the INTELed teachers and trainers and it will keep the participants up to date.

- **G suite [Google Apps for work]**: The G suite is a brand of cloud computing, productivity and collaboration tools, software and products developed by Google. G Suite comprises Gmail, Hangouts, Calendar, and Google+ for communication; Drive for storage; Docs, Sheets, Slides, Forms, and Sites for collaboration. To ameliorate the anticipated tensions due to the teachers' busy schedules, as part of the INTELed professional development we will employ the G suite of technological tools to support the INTELed teachers' training. A combination of synchronous and asynchronous communication tools will be used to support constant access to information and increase teachers' interaction and collaboration.

- **CISCO webex**: Cisco WebEx is the leading enterprise solution for video and web conferencing today. This secure software-based platform for video and audio conferencing, business messaging, and webinars help organizations be more productive. Participants can join from any browser, device, or system-just by answering the phone. To ameliorate the anticipated tensions due to the teachers' busy schedules, as part of the INTELed professional development we will employ the CISCO Webex as a potential tool hosting and supporting teachers' online interactions.

3.3.3 Assessment

One of the main goal of the INTELed project is to help teachers of special education to become "reflective practitioners" and be able to develop their professional skills. In order teachers to reflect on their own practice, high-quality assessment is needed to measure the competence achieved. Assessment could be set on formal methods for objective data collection (such as video) as well as subjective methods (such as professional diaries etc.). Every technique proposed is useful for a specific step during the learning phases or in the pilot ones and not for all activities and steps.

Partners have proposed the following, mostly qualitative, assessment techniques:

- **Surveys with the teachers (teachers' beliefs)**: before training, it is important to identify the teachers' prior knowledge, attitudes and beliefs about inclusion and how they expect that it would be promoted. Towards this direction, a questionnaire will provide insights on the expectations of the teachers on the INTELed training. The questionnaire could also collect data about their personal background and their beliefs about inclusion.

- **Discussion and interviews with the teachers**: Discussion with the teachers can help detect observed processes, patterns and outcomes from their point of view. This type of assessment could be used after the end of the pilots, that students have already created an opinion about the method used. Indicatively, some of the themes that could be explored are the following:
  - o Did the child make further reference to the school/house for dealing with the embodied learning games? (to the rest of the schoolchildren, to his teacher, to his parents)
  - o What were his/her comments? What did s/he like? What did s/he dislike?
  - o Has s/he expressed the desire to continue to play with the embodied learning games at home or at school?
  - o Which one from the embodied learning games did s/he like most? Which one s/he liked less?
  - o What has made the embodied learning games more difficult and less?
  - o What influence did the embodied learning games have on the proper functioning of the school?
  - o Does the child seem to improve his or her skills / abilities / cognitive processes during the sessions with the embodied learning games or stay at steady levels?
  - o Has there been a change in his mood / concentration / performance during the integration section (due to his engagement with the embodied learning games) compared to the traditional lesson?

- o Has there been a change in mood / concentration / performance when returning to class (because of his involvement with the embodied learning games) compared to the traditional lesson?
- o What were the criteria for choosing the range of the embodied learning games and settings for games played by the child?
- o Have changes been observed in the child's physical skills during or after the intervention with the embodied learning games?
- o Have changes or improvement been noted in the child's cognitive profile during or after the intervention with the embodied learning games?

- **Researchers' observations**: This type of assessment could be used during the pilot phase, to detect patterns of behaviour and assess the teachers' teaching practices. An Indicative observation protocol typically consist of a checklist of actions/behaviours, asking whether they are observed or not. It is important that researchers choose carefully the behaviours for which feedback is desired. Possible factors that could be measured are the initiation of play, the energy expended in play, the concentration, the performance, the development of specific skills, etc.

- **Student's questionnaire**: This type of assessment could also be used during the pilot phase in order to collect feedback about the experience gained from the student's point of view. An indicative questionnaire is consisted of statements measured with the Likert scale, as well as open-ended questions.

- **Professional diary**: A professional diary, which can take either a paper-based or a digital format, can provide teachers with a reflective space where they can keep records of their feelings, thoughts and ideas in relation to their practice, through narrative. Through keeping a professional diary, the participating teachers in the INTELed training will be able to elaborate in their idiosyncratic way to illustrate their feelings, impressions and interpretations of teaching via the embodied learning approach.

- **Video recording and self-evaluation**: Recording videos of pedagogical implementations are another valuable tool in the context of teachers' professional development. Such videos could capture a specific learning activity, a lesson or even a sequence of lessons thus providing useful content for the teachers to reflect upon. The video recording technique could encourage the INTELed teachers' critical thinking and behaviour in classroom as it will allow teachers to view teaching presentations by themselves or other colleagues, and thus reflecting on the implementation of the embodied learning approach with their SEN students.

4. INTELed Learning Modules description

According the TPD model, teachers gradually increase the perception of new acquired skills, they get confidence in themselves and they are asked to manage new pedagogical tools in completely autonomy. As a result the learning modules are designed to address four different teacher roles, as following:

#	Learning module title	Role of the teachers
1	Introduction to the INTELed project and its pedagogical framework	Teachers as learners
2	Investigating the INTELed learning materials and their pedagogical affordances	Teachers as designers
3	Implementing and evaluating the INTELed pedagogical framework	Teachers as innovators
4	Reflecting on the INTELed pedagogical framework and training methodology	Teachers as reflective practitioners

For each module description below, the specific objectives, the learning outcomes, specifying knowledge, skills and competence, are indicated.

MODULE 1: Introduction to the INTELed project and its pedagogical framework
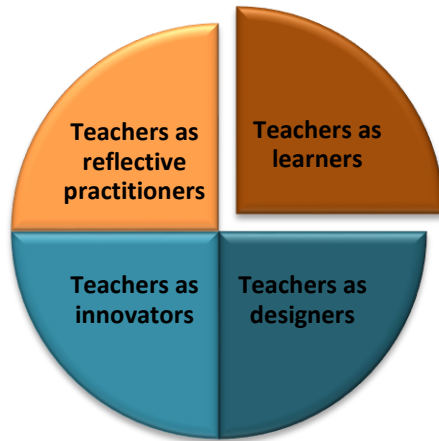
Type: Face to face

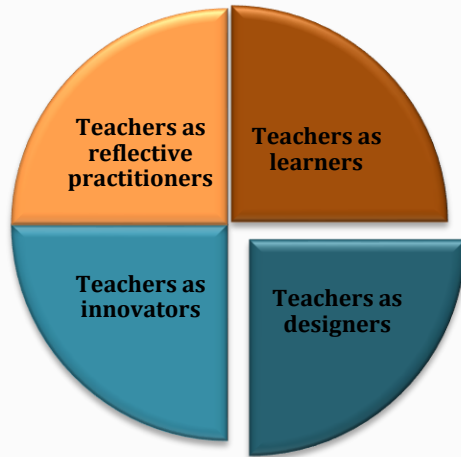**Approach:** Teachers as "learners"

Duration: 5 hours

Learning goal: The learning goal of this module is to introduce teachers into the INTELed pedagogical framework. In particular, this module aims at teachers' familiarization with the notion of embodied cognition through the use of interactive and multi-sensory techniques for addressing the needs of Special Education (SEN) children. In order for this to be achieved during the second part of the module, teachers are asked to participate in a sequence of experiential activities, taking the role of "learners".

Learning outcomes					
Activities (Units)	**Objectives**	**Knowledge**	**Skills**	**Competences**	**Duration**
Introducing the INTELed project	• To present the INTELed project, its approach and key aspects, • To situate the INTELed in the theoretical context of embodied cognition, • To introduce teachers to the notion of "inclusive education via embodied and motion-based technologies", as the overall goal of the INTELed project.	Understand the INTELed approach and the meaning of inclusive education via embodied and motion-based technologies.	Explain the purposes of the project and interpret how embodied and motion-based technologies can promote inclusion.	Outline the purposes of the project and give examples on how embodied and motion-based technologies can promote inclusion.	30 min
Evaluating initial teachers' needs & confidence	• To complete the teachers' needs and confidence questionnaire in order to evaluate teachers' initial needs and confidence in relation to the mains aspects of the INTELed pedagogical framework	Recognize the needs of special education in relation with the INTELed framework.	Match specific needs of special education with the main aspects of the INTELed pedagogical framework.	Show how specific needs of special education can be addressed by the INTELed pedagogical framework.	30 min
Introducing the INTELed pedagogical framework	• To introduce the INTELed pedagogical framework and its pedagogical value. • To divide into groups and to brainstorm about one of the main pedagogical aspects comprising the INTELed pedagogical framework, • to respond to guiding questions included in the "The main aspects of the INTELed pedagogical framework" handout and provoke discussion, • to share the activity results.	Describe the INTELed pedagogical framework and its value to special education.	Brainstorm about the three main concepts of the INTELed pedagogical framework (embodied cognition-motion based technologies-special education).	Reflect on the three main concepts of the INTELed pedagogical framework and and be able to respond to handouts.	1 hour

Learning outcomes					
Activities (Units)	**Objectives**	**Knowledge**	**Skills**	**Competences**	**Duration**
The "Angle makers" or any other INTELed embodied app.	● To provide an overview of the apps' theoretical background, mechanisms, learning goals and relation to the educational curriculum. ● To take the role of learners and experience the app, via taking the students' perspective.	Understand the app and its learning goals.	Experience the app mechanisms as a learner.	Enact the app by setting specific learning goals.	1 hour
The "Young cardiologists" or any other INTELed embodied app.	● To provide an overview of the app's theoretical background, mechanisms, learning goals and relation to the educational curriculum. ● to take the role of learners and experience the game, via taking the students' perspective.	Understand the app and its learning goals.	Experience the app mechanisms as a learner.	Enact the app by setting specific learning goals.	1 hour
Existing and adapted technological toolkits	● to present and provide access to the INTELed repository of existing and adapted technological toolkits, ● to test 1-2 additional embodied learning games for SEN and inclusive educational settings.	Become aware of the INTELed repository of existing and adapted technological tools.	Interpret the categorization of the repository.	Choose a tool from the repository to address a specific case.	30 min

MODULE 2: Investigating the INTELed educative modules and their pedagogical affordances


Type: Face to face

Approach: Teachers as "designers"

Duration: 5 hours

Learning goal: The learning goal of this learning module is to introduce teachers into the INTELed educative modules. In particular, this stage includes teachers' familiarization with the implementation and the affordances of the INTELed educative modules (lesson plans and students' material) developed around the embodied digital games: (a) The "angle makers" and (b) The "young cardiologists".

Learning outcomes					
Activities (Units)	**Objectives**	**Knowledge**	**Skills**	**Competences**	**Duration**
Selecting an educative module	● to present each educative module structured around the embodied digital apps, ● To decide on the educative materials that you would like to implement in your classroom.	Understand the structure and the objectives of each educational module (lesson plans, student materials, assessment tools).	Decide on the educational activity that you would like to implement in the classroom.	Reflect on the implementation of the educational materials according to the specific needs of the classroom.	30 min
Elaborating on the nature of the selected educative module	● To study and elaborate further on the nature of the selected educative module (lesson plans and students' material).	Understand the learning objectives of the selected educative module.	Map the needs of the classroom to the learning objectives of the selected educative module.	Be able to further discuss the affordances of the educative module in relation to the needs of the classroom.	1 hour
SWOT analysis of the INTELed educative modules	● To conduct a SWOT analysis about the INTELed educative module you have selected about strengths (30'), weaknesses (30'), opportunities (30') and threats (30').	Understand the meaning and the need for conducting the SWOT analysis about the selected INTELed educative module.	Complete the SWOT analysis about the selected INTELed educative module.	Reflect on the application of the SWOT analysis about the selected INTELed educative module.	2 hours
SWOT analysis presentation	● To present an overview of the SWOT analysis conducted in 15 minutes.	Understand what should be presented.	Produce the SWOT analysis about the selected INTELed educative module.	Communicate the SWOT analysis about the selected INTELed educative module.	30 min
Assessment: Evaluating the INTELed students' learning gains	● to present the assessment of the INTELed implementations on the employment of the embodied apps, ● To present the INTELed assessment tests that will be allocated pre-post the INTELed implementations for evaluating students' learning gains.	Identify the need for evaluating the embodied apps and the students' learning gains.	Understand the use of assessment pre-post tests for the evaluation of the student achievement.	Review the INTELed assessment tests.	30 min

MODULE 3: Implementing and evaluating the INTELed pedagogical framework
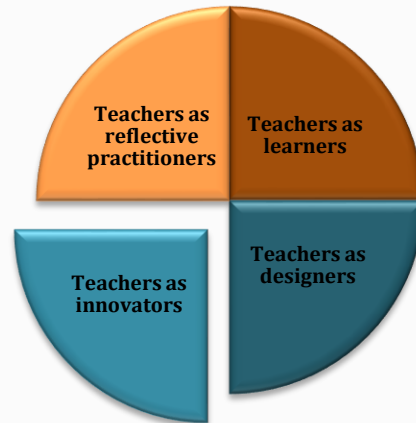

Type: Teaching session

Approach: Teachers as "innovators"

Duration: 5 hours

Learning goal: As part of this learning module teachers' pilots will take place in schools. In particular, during this training module, teachers will be asked to enact the INTELed educative modules (lesson plans and students' material) developed around the embodied digital games: (a) The "angle makers" or (b) The "young cardiologists". During this training module teachers will have the opportunity to assess the effectiveness of the INTELed pedagogical framework though piloting in authentic school environments and implement the knowledge and skills/competencies they have previously gained in praxis.

		Learning outcomes			
Activities (Units)	**Objectives**	**Knowledge**	**Skills**	**Competences**	**Duration**
SEN students' pre-knowledge/competences	● To complete the INTELed assessment tests for measuring their initial knowledge and competences prior to the INTELed implementations.	Understand the need for pre assessment.	Identify the knowledge/competence of the students that need to be evaluated.	Apply the students' assessment test.	15 min
INTELed implementations	● To implement the INTELed educative module (lesson plans and students' material) developed around the embodied digital apps.	Define the main objectives of the courses.	Be able to produce learning objects that address the main objectives of the courses.	Implement the pilots.	4 hours – 3 courses x 80 min
SEN students' post-knowledge/competences	● Students to complete the INTELed assessment tests for measuring the knowledge and competences after the INTELed implementations.	Understand the need for post assessment.	Identify the knowledge/competence of the students that need to be evaluated.	Apply the students' assessment test.	15 min
Reflective diary	● To complete a reflective diary for reflecting on their emotions, attitudes, skills and practices in relation to the INTELed implementations.	Recognize the need to reflect on the INTELed implementations.	Recognize the practices that came up from the INTELed implementations.	Organize practices in a reflective diary.	30 min

MODULE 4: Reflecting on the INTELed pedagogical framework and training methodology
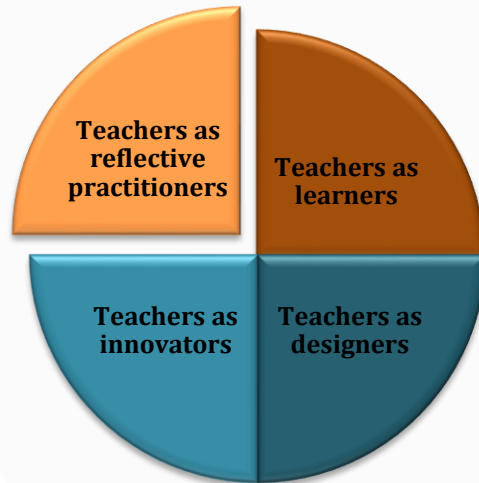
Type: Face to face

Approach: Teachers as "Reflective practitioners"

Duration: 5 hours

Learning goals: The learning goal of this training module is to provide the INTELed in-service teachers with the opportunity to reflect on the INTELed training methodology as well as to share their experiences with their colleagues about the implementations of the INTELed pedagogical framework.

Learning outcomes					
Activities (Units)	**Objectives**	**Knowledge**	**Skills**	**Competences**	**Duration**
Ownership of the INTELed pedagogical framework	● to indicate the six main factors of INTELed TPD program which contributed to your ownership towards the INTELed pedagogical approach, as well as to assess and weight these factors.	Recognize the advantages of using the INTELed TPD program.	Indicate the six main factors of INTELed TPD program which contributed to your ownership towards the INTELed pedagogical approach ate six main factors.	Assess the factors which contributed to your ownership towards the INTELed pedagogical approach ate six main factors.	30 min
Evaluating initial teachers' final needs & confidence	● to complete the "Teachers' needs and confidence" questionnaire.	Understand the purpose of the final evaluation of needs and confidence.	Identify the final needs and confidence in relation to the mains aspects of the INTELed pedagogical framework.	Complete the questionnaire and reflect on it.	30 min
SWOT analysis of the INTELed pedagogical implementations	● To conduct a SWOT analysis of your INTELed implementations.	Understand what should be presented in the SWOT analysis.	Produce the SWOT analysis about the INTELed implementation.	Communicate the SWOT analysis about the INTELed implementation.	2 hours

5. Repository of ICT multi-sensory educational resources

A collection of existing training resources about ICT multi-sensory educational tools for SEN children has been created. The resources collected are educational embodied apps using mainly Kinect cameras. Moreover, all the resources are oriented to young children (mostly primary school) and to special education needs. These materials, annexed at the end of this report, will be adopted or adapted for re-use during the implementation of the training events and the pilots.

The use of the repository, requires that teachers should first determine what the learning outcomes of the activity are. When selecting a tool it is important to consider the following issues:

- The skills domain: each tool develops different skills. The teacher can focus on a particular type of skill, such as cognitive, motor and sensory, academic, social and emotional skills. Given that the majority of the apps are using Kinect cameras, most of them develop motor skills in combination with others.
- The subject of the activity: the academic subjects covered in the repository are language, mathematics and science or a combination of all of them.
- The special needs of the classroom / student and the school age: the educational level/age/needs of the students is a field that is defined by each resource.
- The language: all of the tools are available in English language and some support extra languages such as Greek, Spanish and Dutch.
- The cost: not all of the resources are free for download.
- The equipment and the system requirements: all of the resources require the use of a Kinect camera which has specific technical requirements.

The above issues have been used to form a set of searchable fields suggested in the repository. As a result, teachers and therapists are able to select from repository the perquisites of their activity and conclude to an appropriate tool for the implementation of their learning goals.
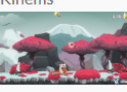
The repository is available online in the INTELed website (https://www.inteled.org/repository/) in a form of a flexible table that enables users to filter the tools according to their preferences.

Its use is very easy and will help teachers and therapists to adapt their learning goals on the appropriate tools.

Below print screens of the online repository are provided:

Name	Provider/Suite	Link	Skills domain	Subject	Special needs/School ages	Language	Cost	Equipment
Search								
Electric Field Series	Embodied Games	https://www.embodied-games.com/games/	Motor-sensory & academic skills	Physics	Primary school (2nd to 10th graders)	English, Spanish, Dutch, Greek	Free download	Kinect camera
Fairy Bells	Kinems	https://academy.kinems.com/games/fairy-bells	Motor-sensory & Academic skills	Mathematics	4 to 8 years old	English and Greek	Paid	Kinect camera
Go Jelly	Kinems	https://academy.kinems.com/games/go-jelly	Motor-sensory & Socio-emotional	n/a	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera

Mathloons	Kinems	https://academy.kinems.com/games/mathloons	Motor-sensory and Academic skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Paleo	Kinems	https://academy.kinems.com/games/paleo	Cognitive, Motor-sensory & Academic Skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Pico's adventure	M4ALL	http://m4all-community.org/enrol/index.php?id=2	Socio-emotional skills	n/a	ASD children (4-6 years old)	English, Spanish, Catalan	Free download	Kinect camera

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6. Conclusions

This report - a compilation of the tasks that have been accomplished during the O2 - has presented the training methodology for SEN teachers, based on the pedagogical framework described in O1. Its purpose is to act as a useful handbook for the INTELed model for SEN teacher training.

In particular, the first part of the report presents the TPD model and the ways that can be appropriate facilitated in the INTELed training programme. To this purpose four roles (learners, designers, innovators and reflective practitioners) are defined for SEN teachers that help them to develop professional skills in the field of ICT and embodied learning.

The second part of the report develops the main body of the INTELed teacher training, which consists of methodologies, tools and assessment types that will be exploited during the implementation of the training events and the pilots. All partners have contributed in the collection of the aforementioned material which derives from well-documented sources.

The third part is an analytical presentation of the training modules. Basic information has been provided for each module, such as duration, learning goals, role of the teachers. Moreover, each module is segmented in activities/units and for each activity there is a description of the knowledge, skills and competences that the users are expected to develop in order to advance their professional profile.

The final part of the report, is referred to the collection of ICT tools developed in O1. Through its online form located in the INTELed website, it is transformed into a practical repository that teachers can use during the pilot phase. A list of practical tips are listed within this report to facilitate the appropriate use. The repository is annexed in this report.

It is expected that this report will act as reference for the implementation of the training events and the pilots. The evaluations of the INTELed training, could be used to optimize the methodology in a future perspective and become an evidence for educational policy changes.

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Annex - Repository of ICT multisensory resources for SEN students

Name	Provider / Suite	Link	Skills domain	Subject	Special needs / School ages	Language	Cost	Equipment
Alien Health	Embodied Games	https://www.embodied-games.com/games/	Academic and cognitive skills	Science	Primary school (2nd to 10th graders)	English, Spanish, Dutch, Greek	Free download	Kinect camera
Angles	David Renton	https://drenton72.wordpress.com/downloads	Academic and Motor-sensory skills	Mathematics	Primary school	English	Free download	Kinect camera
Bilisius	Kinems	https://academy.kinems.com/games/bilisius	Academic, Cognitive and motor-sensory skills	Mathematics	Kindergarten; Primary school (4 to 8 years old)	English, Greek and Spanish	Paid	Kinect camera
Bubble game - Polimi Games	M4ALL	http://m4all-community.org/enrol/index.php?id=5	Motor-sensory skills	n/a	Primary school	English	Free download	Kinect camera
Clockoo	Kinems	https://academy.kinems.com/games/clockoo	Motor-sensory & Academic skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Dalyn's Dragon Island	M4ALL	http://m4all-community.org/enrol/index.php?id=4	Motor skills; cognitive skills; socio-emotional skills	n/a	Primary school	English	Free download	Kinect camera
Do Like	Kinems	https://academy.kinems.com/games/do-like	Academic and Motor-sensory skills	Science	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera

Doffies	Kinems	https://academy.kinems.com/games/doffies	Academic and Motor-sensory skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Dr. Grafoo	Kinems	https://academy.kinems.com/games/dr-grafoo	Cognitive, Motor-sensory & Academic Skills	Mathematics	4 to 8 years old	English and Greek	Paid	Kinect camera
Drumory	Kinems	https://academy.kinems.com/games/drumory	Cognitive, motor-sensory skills	n/a	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Electric Field Series	Embodied Games	https://www.embodied-games.com/games/	Motor-sensory & academic skills	Physics	Primary school (2nd to 10th graders)	English, Spanish, Dutch, Greek	Free download	Kinect camera
Fairy Bells	Kinems	https://academy.kinems.com/games/fairy-bells	Motor-sensory & Academic skills	Mathematics	4 to 8 years old	English and Greek	Paid	Kinect camera
Go Jelly	Kinems	https://academy.kinems.com/games/go-jelly	Motor-sensory & Socio-emotional skills	n/a	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Lexis	Kinems	https://academy.kinems.com/games/lexis	Academic & Motor-sensory skills	Language	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Little magic stories	Chris O'shea	http://www.chrisoshea.org/little-magic-stories	Cognitive & socio-emotional skills	Language	Primary school (6 to 8 years old)	English	Free download	Kinect camera / Musion Eyeliner holographic projection system
Magic Cursor	David Renton	https://drenton72.wordpress.com/downloads	Academic & Motor-sensory skills	Language	Primary school	English	Free download	Kinect camera

Marvy Learns	Kinems	https://academy.kinems.com/games/marvy-learns	Cognitive, Academic & Motor-sensory skills	Mathematics and Language	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Math Mage	David Renton	https://drenton72.wordpress.com/downloads	Motor-sensory and Academic skills	Mathematics	Primary school	English	Free download	Kinect camera
Mathloons	Kinems	https://academy.kinems.com/games/mathloons	Motor-sensory and Academic skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Paleo	Kinems	https://academy.kinems.com/games/paleo	Cognitive, Motor-sensory & Academic Skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Pico's adventure	M4ALL	http://m4all-community.org/enrol/index.php?id=2	Socio-emotional skills	n/a	ASD children (4-6 years old)	English, Spanish, Catalan	Free download: http://m4all.upf.edu/?page_id=72	Kinect camera
Pictogram room	Orange Foundation, University of Valencia (Spain) and Adapta.org Foundation.	http://www.pictogramas.org/proom/init.do?method=initTab	Socio-emotional & cognitive skills	Language	ASD children (6 to 12 years old)	English, Spanish, French	Free download (previous registration: http://www.pictogramas.org/proom/init.do?method=downloadsTab)	Kinect
Ponder Up	Kinems	https://academy.kinems.com/games/ponder-up	Academic & Motor-sensory skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Pong	David Renton	https://drenton72.wordpress.com/downloads	Motor-sensory & Academic skills	Mathematics	Primary school	English	Free download	Kinect camera

PotelRVR. Pottery maker simulator.	Private provider	https://naruse.itch.io/potelrvr	Motor-sensory & Socio-emotional skills	n/a	Upper primary school; Secondary school	English	Free download (donation accepted) https://naruse.itch.io/potelrvr/download/eyJleHBpcmVzIjoxNTIyMTQwNDA1LCJpZCI6NDE5MTZ9.iQQMC0X0sntYxZY%2fDumi3wgEHEs%3d	Oculus sensor and leap motion
Quarry Bam	Kinems	https://academy.kinems.com/games/quarry-bam	Academic and Motor-sensory skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Remaze	M4ALL	http://m4all-community.org/enrol/index.php?id=28	Cognitive & motor-sensory skills	n/a	Primary school		Free download	Kinect camera
River Crossing	Kinems	https://academy.kinems.com/games/river-crossing	Cognitive & Motor-sensory skills	n/a	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
RuniRoon	Kinems	https://academy.kinems.com/games/runi-roon	Academic & Motor-sensory skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Sea Formuli	Kinems	https://academy.kinems.com/games/sea-formuli	Academic & Motor-sensory skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Seishin	Kinems	https://academy.kinems.com/games/seishin	Motor-sensory & Socio-emotional skills	n/a	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Shape game - Polimi Games	M4ALL	http://m4all-community.org/e	Cognitive & motor-sensory skills	n/a	Primary school	English	Free download	Kinect camera

		nrol/index.php?id=5						
Shape in Place	Kinems	https://academy.kinems.com/games/shape-in-place	Cognitive, Motor-sensory & Academic Skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Somantics	Cariad Interactive	http://cariadinteractive.com/somantics/	Socio-emotional skills	n/a	Children with ASD	English	Free download	Ipads/Kinect camera
Space game - Polimi Games	M4ALL	http://m4all-community.org/enrol/index.php?id=5	Cognitive & motor-sensory skills	n/a	Primary school	English	Free download	Kinect camera
Space Motif	Kinems	https://academy.kinems.com/games/space-motif	Motor-sensory & Academic skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Spot On	Kinems	https://academy.kinems.com/games/spot-on	Motor-sensory & Academic skills	Language	4 to 8 years old	English and Greek	Paid	Kinect camera
Suffizz	Kinems	https://academy.kinems.com/games/suffizz	Academic skills	Language	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
The Melody Tree	Kinems	https://academy.kinems.com/games/the-melody-tree	Cognitive & Motor-sensory skills	Language	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Tika Bubble	Kinems	https://academy.kinems.com/games/tika-bubble	Academic & Motor-sensory skills	Mathematics and Language	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera

Time	David Renton	https://drenton72.wordpress.com/downloads	Academic & Motor-sensory skills	Mathematics	Primary school	English	Free download	Kinect camera
Trekins	Kinems	https://academy.kinems.com/games/trekins	Motor-sensory & Academic skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
U-Paint	Kinems	https://academy.kinems.com/games/u-paint	Motor-sensory & Socio-emotional skills	n/a	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
UnBoxIT	Kinems	https://academy.kinems.com/games/un-box-it	Cognitive & Motor-sensory skills	Language	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Uni paca girl	M4ALL	http://m4all-community.org/enrol/index.php?id=3	Motor-sensory & cognitive skills	n/a	Primary school	English		Kinect
Walks	Kinems	https://academy.kinems.com/games/walks	Cognitive & Motor-sensory skills	n/a	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Word Mage	David Renton	https://drenton72.wordpress.com/downloads	Academic & Motor-sensory skills	Language	Primary school	English	Free download	Kinect camera
Word Sposh	Kinems	https://academy.kinems.com/games/word-splosh	Cognitive, Motor-sensory & Academic Skills	Language	4 to 8 years old	English and Greek	Paid	Kinect camera
Xdigit	Elwin Lee	http://www.elwinlee.com/portfolio/game/xdigit/	Academic & cognitive skills	Mathematics	Primary school	English	Non commercial Creative Commons Licence; Free download.	Kinect camera

Yeti Jump	Kinems	https://academy.kinems.com/games/yeti-jump	Motor-sensory, Academic and Cognitive Skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Yummy Pairs	Kinems	https://academy.kinems.com/games/yummy-pairs	Motor-sensory, Academic & Cognitive Skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera
Zoko Write	Kinems	https://academy.kinems.com/games/zoko-write	Motor-sensory & Academic skills	Language	4 to 8 years old	English	Paid	Kinect camera