

Intellectual Output 1-Task 3

A collection of existing ICT multi-sensory educational resources and tools for learning and assessment for the support of SEN students

CONSORTIUM

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

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Executive Summary

This report presents the work and results of the third task of the Intellectual Output 1 (IO1-T3) of INTELED. It presents a collection of ICT multi-sensory educational resources and tools for learning and assessment for the support of SEN students. This collection is part of the Pedagogical Framework for training SEN teachers on the INTELED model, which is the main focus of this intellectual output (IO1).

The report summarizes the process followed to collect and select the multi-sensory resources and tools included in the collection, as well as the structure defined to describe these resources and tools. This task is closely connected with task IO2-T3, devoted to building an online repository of ICT multi-sensory educational resources and tools for SEN students and teachers. One of our main focus in IO1-T3 has been to select a sub-set of fields that could be used in the future to search these resources and tools, i.e., searchable fields. For these searchable fields we have defined a vocabulary based on known standards, and the resources have been described using this vocabulary. By doing this, we expect to facilitate the development of the online the repository, as this will be developed and presented as part of the IO2-T3.

In addition to the description of the process and the structure of the description of the resources and tools, the report presents the list of resources and tools that have been found after a systematic search. Although the search has been exhaustive, the collection will be complemented with new resources and tools, if we get to meet a new one, or if new resources and tools are developed during the project timespan.

1. Introduction

The pedagogical framework for training SEN teachers in the usage of ICT multi-sensory educational resources and tools requires the identification of the available tools and resources that can be used by SEN students and teachers in their educational contexts.

To this aim, the partners of INTELED have carried out a structured search of these available resources. In IO1, the basic steps to structure the information have been made, so that it can be reused in IO2-T3 to build a repository of ICT multisensory resources available for teacher training and for their usage in the INTELED pilots.

This document presents the structure of the repository, with the different fields taken into account to build it, and then lists the content of that repository which will be made available on-line in O2.

2. Process and results of the collection of resources

The collection of ICT multi-sensory educational resources and tools has been the result of close collaboration among all the partners involved in the project. A preliminary list of ICT multi-sensory educational resources and tools was proposed by the University of Piraeus Research Center (UPRC) and the Cyprus University of Technology (CUT), based on the prior experience and research work in the field. This collection has been complemented with additional tools and resources found as part of the literature review carried out in IO1 focusing on embodied learning assisted by ICT multi-sensory tools, which helped us to add new tools to the list. In addition, the University of Valladolid (UVa) carried out a structured search, looking for games and resources with search keys “embodied games” and “special education” and their variations. The search yielded a small number of additional resources that were added to the collection.

Once the list of ICT multi-sensory educational tools and resources was identified, the structure for its description was discussed with the rest of the partners. CESIE, in charge of the INTELED webpage, gave some ideas that were taken into account to make the collection of tools and resources easier to be re-used in the context of IO2-T3 (ICT multi-sensory educational tools and resources) so that the repository can eventually be uploaded on the INTELED webpage to be used by SEN teachers, teacher trainers and students.

A small subset of the tools and resources initially identified are research prototypes, and they are not available for external use. Thus, a third step consisted on filtering the resources to select those that are available for download and use (both free and with previous payment). As a result, we built two separate lists of tools and resources, one with those ones that were available at the time of the revision, and another with the rest. This report focused on the first set (the available tools and resources), as they are the ones that can feed the INTELED repository. However, we decided to leave the second list of tools (i.e., the non-available ones) accessible on-line¹, as they illustrate work

¹ The complete collection can be downloaded from this URL: <https://drive.google.com/open?id=1-H-wqhk1i1yBBY4aDAdt612JUf5DSx5I>. The non-available tools are listed in a second page

carried out in the area, and can be eventually used as examples or as inspiration for new developments.

Apart from its practical use as the base for the repository of tools, the collection of resources helps to understand better the INTELED domain. Two important conclusions derived from the search and selection of tools were:

- All the resources were games, mainly oriented to small children (mostly primary school) and to special education needs.
- The majority of the games were created for Kinect cameras. The explanation of the reasons of this choice are described in previous reports of this output (INTELED consortium, 2018)

The next section describes the fields that have been agreed by the partners to describe the collection of resources.

3. Description of the fields used to characterize the tools

This section describes the fields used to build the structured description for the collection of available ICT multisensory educational tools and resources.

These fields were initially suggested by one of the partners and have been discussed among the members of the consortium, in order to get a balance between a set of searchable fields filled out with labeled values, and free-text description that will help users complete the information about each tool or resource selected. The fields and their description appear in Table 1.

Table 1. Description of the fields used in the collection of tools.

Field	Data type	Description
Name	Short string	Name of the gaming tool/resource
Provider / Suite	Short string	Name of the provider or of the suite to which the game belongs. This will be a searchable field, as a user can be interested in getting information about all the games proposed by the same author / company.
Link	URL	A link to the game site, with the information provided by the author, and the means to register and/or download the game.
Description	Text	A basic description of the game.
Skills domain	Enumerated (*)	Name of the skill (or skills) that are addressed by the game. It is a searchable field, probably the most important one for teachers and therapists. The values of this field are described below.
Subject	Enumerated	Name of the academic subject (or subjects), to which the game contributes to (if any). In case it is not applicable, the value is n/a.
Goal (description)	Text	A verbose description of the educational goals of the tool.

Special education / school grade	Enumerated	Name of the educational level and/or ages of the children to which the game is oriented. (It is a searchable field, as the user may be interested in tools for a concrete group of students.)
Language	Enumerated	Languages in which the tool is available.
Cost	Enumerated	Free download / Paid
Equipment	Text	Description of the tools that are necessary for playing the game
System requirements	Text	Technical requirements of the system for playing the game
References	Text	Journal articles and conference papers where the gaming tool/resource has been reported

The classification of the skills domain was considered very important, as the teacher or the therapist may want to search for a particular type of skill, or will be interested in knowing which skills are developed for each tool. In order to use a well-known vocabulary of skill domains that could be identified by the experts, we drew on the Integrated Model by Cattell-Horn-Carroll (McGrew, 2009), which was also considered previously by other authors (Kourakli et al., 2017). According to this model, the skills can be classified in the following domains:

- *Cognitive Skills*: Including short-term memory, visual processing and the prior crystallized knowledge.
- *Motor and sensory Skills*: Including kinesthetic skills, i.e Skills that depend on senses to detect position, weight, muscle movement, etc., and that are involved in the process of control and coordination of body movements, such as walking, speech and gestures, and psycho-motor speed, i.e., the speed and flexibility with which body movements are performed
- *Academic skills*: Including mathematics operations and computation, language related skills and other contents related to academic disciplines.
- *Social and emotional skills*: Including the interaction between the pupil and the rest of the group, the collaboration to develop a common task, respect to the norms and emotional relations.

We decided to maintain the level of description to the first level of the hierarchy, which is sufficiently descriptive and easier to use for searching by end-users. It is to be noted that, in the case the user wants to have more information about the skills developed and other details of the game, the rest of the descriptive fields will help them to get this information.

4. Collection of resources

In this section we present the collection of resources, showing a selection of the fields used to describe the resources included in the collection with the intention of providing an overview of these resources, as well as of their characteristics (see Table 2). For reasons of space, the complete collection of resources is available as an online resource², including all the fields documented in Section 2.

² The complete collection can be downloaded from this URL: <https://drive.google.com/open?id=1-H-wqhk1i1yBBY4aDAdt612JUf5DSx5I>

Table 2. Collecton 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 (2 nd to 10 th 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://academic.kinems.com/games/bilisius	Academic, Cognitive and motor-sensory skills	Mathematics	Kindergarden; 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://academic.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://academic.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://academic.kinems.com	Academic and Motor-sensory skills	Mathematics	4 to 8 years old	English, Greek and Spanish	Paid	Kinect camera

Name	Provider / Suite	Link	Skills domain	Subject	Special needs / School ages	Language	Cost	Equipment
Dr. Grafoo	Kinems	m/games/dofies https://academymy.kinems.com/games/dofies	Cognitive, Motor-sensory & Academic Skills	Mathematics	4 to 8 years old	English and Greek	Paid	Kinect camera
Drumory	Kinems	https://academymy.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://academymy.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://academymy.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://academymy.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	Cognitive & socio-emotional skills	Language	Primary school (6 to 8 years old)	English	Free download	Kinect camera / Musion

Name	Provider / Suite	Link	Skills domain	Subject	Special needs / School ages	Language	Cost	Equipment
		/little-magic-stories						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

Name	Provider / Suite	Link	Skills domain	Subject	Special needs / School ages	Language	Cost	Equipment
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/eyJleHBpZmVzIjoxNTIyMTQwNDA1LCJpZCI6NDE5MTZ9.iQQMCOX0sntYxZY%2fDumi3wgEHEs%3d	Oculus sensor and leap motion

Name	Provider / Suite	Link	Skills domain	Subject	Special needs / School ages	Language	Cost	Equipment
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
RuniRoom	Kinems	https://academy.kinems.com/games/runi-room	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/enrol/index.php?id=5	Cognitive & motor-sensory skills	n/a	Primary school	English	Free download	Kinect camera

Name	Provider / Suite	Link	Skills domain	Subject	Special needs / School ages	Language	Cost	Equipment
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

Name	Provider / Suite	Link	Skills domain	Subject	Special needs / School ages	Language	Cost	Equipment
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

Name	Provider / Suite	Link	Skills domain	Subject	Special needs / School ages	Language	Cost	Equipment
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://academic.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/games/xdigit/	Academic & cognitive skills	Mathematics	Primary school	English	Non commercial Creative Commons Licence; Free download.	Kinect camera
Yeti Jump	Kinems	https://academic.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://academic.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://academic.kinems.com/games/zoko-write	Motor-sensory & Academic skills	Language	4 to 8 years old	English	Paid	Kinect camera

5. Final remarks

This report has presented the work carried out to compile a collection of available ICT multi-sensory resources and tools for SEN children.

The collection is part of the first intellectual output of INTELed, aimed at building a Pedagogical Framework to describe the main concepts related to the project and their relationships. This collection of tools and resources contributes to the framework by providing concrete information of what resources are available for teachers and their trainers. As aforementioned, by building the list of resources and tools we found out that most of the resources take the form of games, and that these games have been implemented in a large majority for the Kinect camera. These results are important to set the scope of future outputs in the project.

Besides the knowledge gained by compiling this list of resources, the list itself has been defined in a way that it will be easily adapted by O2-T3 for the development of an online repository of tools and resources to be used in the training events (and eventually, by the teachers and specialists in the pilots).

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