



# Global Junior Challenge

Projects to share the future

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## Blue Arrow

**Tipologia dell'ente/Kind of organization:** SME

**Nome dell'ente che lo ha realizzato/Organization-institute presenting the project:** Smarted srl

**Regione/Region:** Campania

**Paese/ Country:** Italia

**Città/City:** Napoli

**Descrizione del progetto/Describe the project :** Once upon a time there was a big arrow, blue-painted, that was in a shop window with other toys. And... during the life of its own to reach the children that needed each other, was the affinity with each worthy child. This is not Disincantato (Blue Arrow/La Freccia Azzurra) written by Gianni Rodari in 1996 by an European coproduction between Italy, ARROW project borrows the name starting from the book to be in memory of Gianni Rodari, in the centenary of the author of children literature famous all over the Europe. The biennial Hans Christian Andersen Medal in 1970 for children project works on the metaphors that starts from the Rodari's improvement of the teacher education of pre-primary institutions Initial Teacher Education (ITE) and Continuing Education by providing new tools and new methodologies. During the pandemic sector exposed its fragilities and its adaptability. Europe provide sufficient and better-quality education and raise the pandemic has come suddenly and brought several millions of million people who are directly related to education sector affected (Gabriel, 2020) and many of them have been forced to face (f2f) education into digital one. The new approaches and lockdowns have a huge impact on the education in kindergarten, in particular in the range of age 4-7, where children need to be manipulating things without writing and reading skills. The disruptions caused by COVID-19 to everyday life means that millions worldwide have missed out on early childhood education which is problematic because "they thus missed a stimulating learning opportunities". Declaratory learning, based on traditional methods exported in distance learning: MOOCs and videoconferencing.

the case of children that are not able to read and write, the procedural learning that refers to experience and laboratorial activities involving the senses is fundamental and is needed a rethinking when schools close and lessons are in front on a screen. This rethink should start from the new competences for the teachers, through the teacher education in HEIs. The BLUE ARROW project is funded by an Erasmus+ Project, a Strategic Partnership Key Action 2 in Higher Education, Grant Agreement 2020-1-IT02-KA226-HE-095644. The BLUE ARROW project aims to create an innovative pedagogical approach for teacher education that involve the development of a MOOC and the implementation of these practices in higher education courses for teacher education for the new challenge of distance learning: - including new ways to teach applying digital creativity, - proposing user-friendly tools and secure platforms which respect privacy and ethical standards, - developing new innovative educational methods for pre-primary and primary educators applying Tangible User Interfaces. A synergic and complementary Partnership was built: BLUE ARROW includes 3 pedagogical HEIs (Università di Foggia (Leader), University of Barcelona and Reald University College) in teacher education (Initial Teacher Training and Continuous Professional Development); a SME expert in TEL ground-breaking devices (Smarted srl that submit in this call) and an association of HEIs in distance learning (EADTU). Four countries are represented (Italy, Spain, Netherlands and Albania) BLUE ARROW will produce the following outcomes: 1. A pedagogical framework in the field of teacher education aimed at the improvement of competences of pre-primary and primary teachers about distance teaching, also a response on COVID-19 situation. 2. A MOOC with lessons held by teacher educators in HEIs (O2), with an International presentation. 3. An ICT platform that will be embed in the MOOC, based on Tangible User Interface paradigm, that allows the management of laboratory activities in teaching for children between 4 and 7 years old, including a multisensory approach based on exercises co-created with teacher educators and other learning experts. 4. A report that will show the results and the impact of the BLUE ARROW methodology and technology and the guideline for a reapplication in other contexts. 5. A series of co-creation events in 4 countries with experts where they will evaluate and propose new laboratory exercises with TUIs for distance teaching and evaluate the implementation. 6. An annual international conference on distance and blended learning for pre-primary and primary teachers (E10).

OUR INNOVATION In particular in this call for GJC we present the third point: the multisensory exercises with tangible objects and connected with the digital interfaces. Each kit that will be created will include: 1. An NFC antenna, it is a hardware, namely an active board (an NFC antenna covered by plexiglass and connected via USB to PC or tablet) that can "recognize" tangible materials (tagged with NFC sensors) to allow the digital environment (stories interface on tablet or computer) to give feedback. (see that prototype delivered by SM for children education <https://youtu.be/58RyzCDUsdU> and Annex I). 2. A set of specific tangible objects for the kit based on the exercises delivered and co-created with teacher educators and teachers. All exercises will exploit Tangible User Interfaces (TUIs) allows the children (and teachers) to interact with tangible and multisensorial objects, then physical objects could be recognized by a digital component. The objects will be based on well known psycho-pedagogical practices as logic blocks, number cards, tangram, teaching tiles, everyday objects. The tangible objects could also foster a multisensory approach, in some previous experiences (Ponticorvo et al. 2017 see Annex II). 3. A software empowered with adaptive artificial tutors (IA competent) that will orchestrate the interaction between the learner and the platform, providing feedbacks, corrections, suggestions, and proposals of some in-depth study. It has a high degree of transferability because each teacher or child could use independently, and the difficulty of the exercises will be personalized and adapted on the learner's previous performance. The Consortium estimate that the BLUE ARROW Kit will have a relevant impact in the teacher education, providing a new solution for laboratorial activities in children education. This is a new approach for contrasting the consequences of

COVID-19 lockdowns or the needs to sustain a blended or a distance learning. In addition, the provided solution has an excellent grade of inclusion because promote a learning/teaching based also to a sensory approach that is tailored for children with special needs (deafblind, sensory impairment, autism spectrum disorder, etc.)

**Link al video di presentazione/Link to the presentation video:** [https://youtu.be/0DYZd\\_XvgqM](https://youtu.be/0DYZd_XvgqM)

**Categoria del progetto/Project category :** Educazione fino a 10 anni/Up to 10 years

**Uso delle tecnologie / Use of technologies:** An innovation follows in the TUIs application for inclusion between the virtual environment of most learning tools and real objects. The hybrid approach allows an interaction by interface (PC, tablet, smartphone), through the mediation of sensors, thus involving all the senses, including touch, hearing, human ability to grasp and manipulate physical objects and so on. The TUI tool is composed of a board that can "recognize" tangible objects (sensors) to allow the digital environment to give feedback (see <https://youtu.be/58RyzCDUdU>). Physical objects (sensors) of different materials, animals, jars with odors). These objects interact with the interface; allowing an experiential learning approach for teachers. BLUE ARROW has extensive experience in the development and application of this technology, prize as the best "People Centered Smart Learning Ecosystem" at the conference [https://video.ilmattino.it/innovazione/lavagna\\_2017](https://video.ilmattino.it/innovazione/lavagna_2017) in 2017. BLUE ARROW will exploit the hardware component of the project: a kit of objects aimed at a laboratory approach. Each kit contains an NFC antenna, it is a hardware, namely an active board (acrylic plexiglass and connected via USB to PC or tablet) that can interact with objects (tagged with NFC sensors) to allow the digital environment (computer) to give feedback. (see that prototype delivered in <https://youtu.be/58RyzCDUdU> and Annex I). 2. A set of exercises based on the exercises delivered and co-created with teachers. These exercises will exploit Tangible User Interfaces (TUIs) allowing to interact with tangible and multisensorial objects, then physical objects with a digital component. The objects will be based on well known objects as logic blocks, number cards, tangram, teaching tiles, etc. This approach could also foster a multisensory approach, in some previous projects (2017 see Annex II). 3. A software empowered with adaptive algorithms will orchestrate the interaction between the learner and the teacher, corrections, suggestions, and proposals of some in-depth exercises. The transferability because each teacher or child could use in the classroom. Exercises will be personalized and adapted on the learner's needs.

**Indicare gli elementi di innovazione del progetto / What are the innovative aspects of the project?:** The innovative aspects of the project are the interaction between the virtual and real objects, the use of the interface (PC, tablet, smartphone), the use of sensors, thus involving all the senses, the human ability to grasp and manipulate physical objects and so on.

**Con quanti utenti interagisce il progetto?/How many users does the project interact with? :** The project is running but with a limited number of users.

**Di quali mezzi o canali si avvale il progetto?/Which media or channels does the project use?:** The BLUE ARROW project is using the Action 2 initiative.

**Il progetto è già stato replicato? /Has the project already been replicated? :** No

**Quali sono le aspettative future?/What are future expectations?:** The target groups of the project are the teachers and the children.

teachers. The teacher educators represent the main target of the project, because the BLUE ARROW project aims to innovate the teacher education programme. The secondary and consequent target groups are the teachers that will be involved in project activities. The BLUE ARROW project is based on the active participation of end users, that will participate having multiple roles: • Teacher educators o Co-creators of OERs. o Evaluators and contributors of development and selection of the BLUE ARROW kit. • Teachers o MOOC's learners o Users of the BLUE ARROW kit. o Evaluators of the BLUE ARROW ki

**Durata progetto/project duration:** 30 months

**Risultati ottenuti/Results:** On going project started on March 2021.

**Cognome del coordinatore del progetto/project coordinator surname :** Di Fuccio

**Nome del coordinatore del progetto/project coordinator name :** Raffaele

**Il Progetto ha contribuito ad affrontare la pandemia da Covid-19? / Has the project helped facing the emergency of Covid-19? :**

The Consortium  
education, prov  
new approach  
sustain a blenc  
grade of inclus  
that is tailored  
spectrum disor

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