

Tangible Programing & Inclusion

Promoting inclusion and a STEM curriculum in schools through the use of tangible programming concepts and activities

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Consortium



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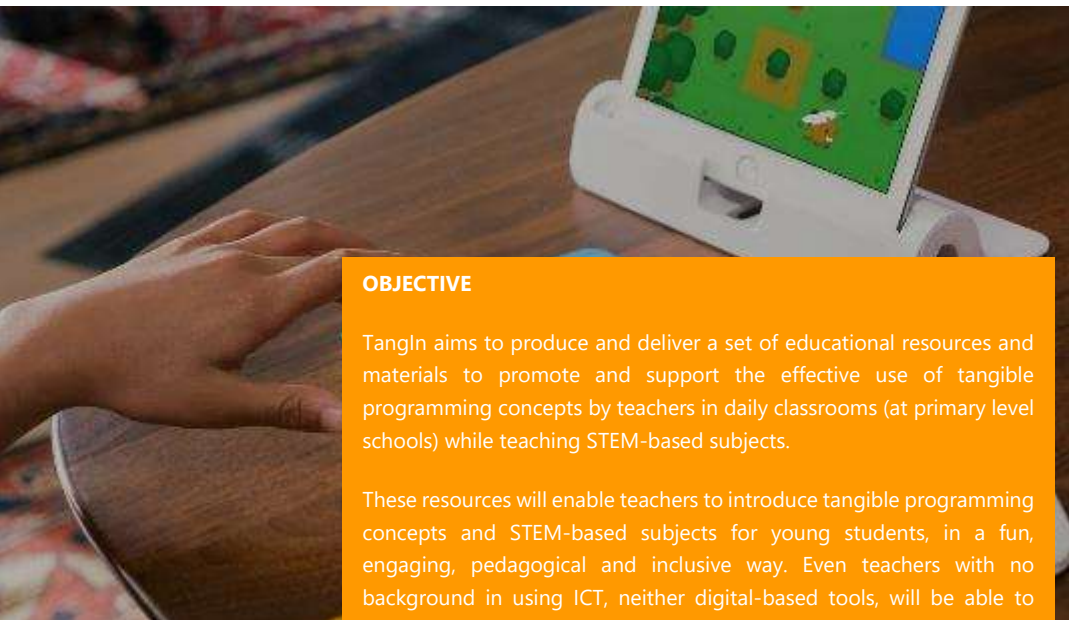
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OBJECTIVE

TanglN aims to produce and deliver a set of educational resources and materials to promote and support the effective use of tangible programming concepts by teachers in daily classrooms (at primary level schools) while teaching STEM-based subjects.

These resources will enable teachers to introduce tangible programming concepts and STEM-based subjects for young students, in a fun, engaging, pedagogical and inclusive way. Even teachers with no background in using ICT, neither digital-based tools, will be able to promote and teach tangible programming concepts, with support of physical interfaces (which can be a very simple robot).

BACKGROUND

According to the EC, Europe will have up to 825.000 ICT job vacancies by 2020 difficult to fill due to the shortage of skilled labour force. Basic coding skills are also needed, as more than 90% of today's professional occupations do require digital competences, including programming. A few years ago, 58% of EU employers stated that ICT curricula needed to be much stronger, even at primary/secondary levels, to ensure that ICT skills needs are met in the future (Kolding et al., 2009). On top of this, women are underrepresented in STEM-based occupations (Burchell et al. 2014 - women account for just 24 % of science and engineering professionals).

Therefore, even if not everybody is expected to be either an engineer or a programmer, the ability to use and understand tools and language of this fast-paced information era is critical for self-determination of an individual in the future society. The command of digital tools and programming skills/concepts, as well as critical reasoning skills, should be considered an "universal language", as they will be part of the XXI century literacy skills.

TanglN project strongly believes that education is the cornerstone for responsible citizens and an inclusive and prosperous society. If we expect children to have equal opportunities and fulfil their potential in the future society, school curricula should focus more on this future (current) challenges and tackle them early on.

EXPECTED RESULTS

IO1 - Using programming concepts to stimulate learning of STEM subjects at primary school levels

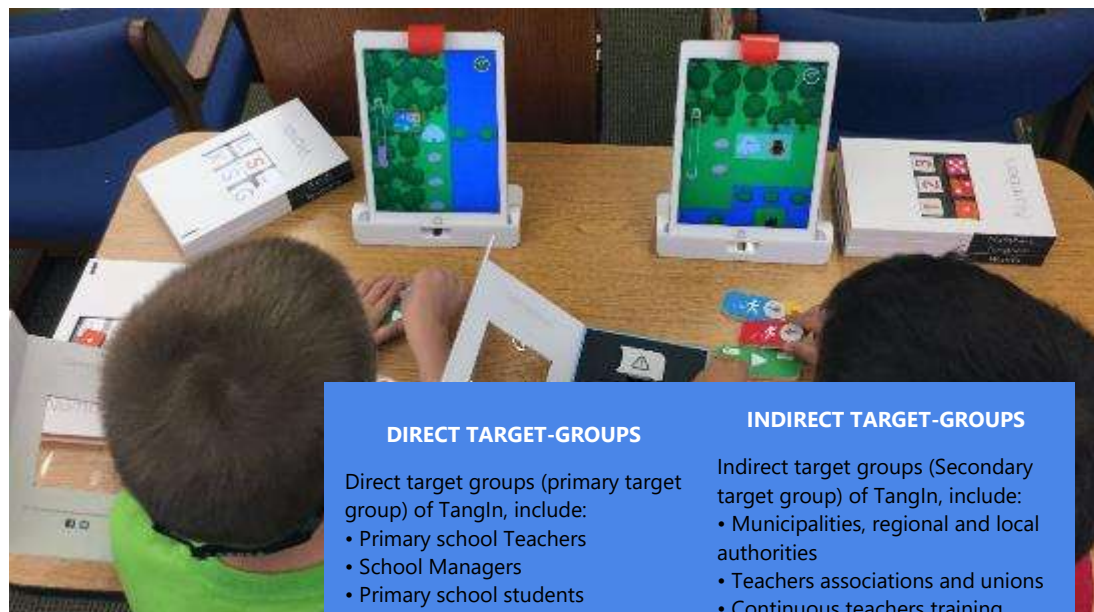
→ detailed report providing guidance to schools and researchers on how can tangible programming resources and concepts be used in the classrooms, with young students, to foster their motivation for STEM-based subjects and to promote students' inclusion.

IO2 - TanglN toolbox of resources → toolbox for school teachers and school managers composed by a set of activities to be implemented in daily classes and a teachers' guide manual,

The toolbox will include specific activities or lessons covering different STEM-related topics at all levels of the primary education level.

IO3-TanglN Teachers training package → detailed training package to train teachers on how to use the resources developed, mainly the toolbox of educational activities and the teachers' guide, and also on how they can further develop new activities or lessons in other topics.

Furthermore, the project will include a **European train the teachers course; local peer-learning actions** at schools' level; **pilot of the resources with students** and four local **multiplier events**.



DIRECT TARGET-GROUPS

Direct target groups (primary target group) of TanglN, include:

- Primary school Teachers
- School Managers
- Primary school students
- Researchers and research institutions from educational area
- Experts in education

INDIRECT TARGET-GROUPS

Indirect target groups (Secondary target group) of TanglN, include:

- Municipalities, regional and local authorities
- Teachers associations and unions
- Continuous teachers training providers
- Higher Education providers
- Policy Makers