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SPIRIT SCHOOL PILOT

VALIDATION REPORT

MAGYAR DIGITÁLIS OKTATÁSÉRT EGYESÜLET
VITACOMM EDUCATION
FONDAZIONE PATRIZIO PAOLETTI
erasmus HOGESCHOOL BRUSSEL
UNIVERSITATEA SAPIENTIA

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1. Introduction – Context of the SPIRIT school pilot and validation

1.1. The pedagogical and European policy context of the SPIRIT project

The **SPIRIT – Skills of tomorrow for children of present: complex future-skill development with the synergy of learning activities, game-based learning and STEAM** Erasmus+ cooperation project (2023-1-HU01-KA220-SCH-000154457) was developed in response to the increasingly complex role that primary education must play in preparing children for the future. The role of schools can no longer be limited to the transmission of subject-specific knowledge. In a context characterised by rapid technological, social and environmental change, growing importance is attached to the **transversal, personal, social and emotional competences** that enable children to adapt flexibly to changing circumstances, build relationships, collaborate with others, think critically, solve problems, regulate their emotions and lead active, balanced and meaningful lives.

This approach is closely aligned with the competence-based orientation of European education policy. The European Union's framework on key competences for lifelong learning does not treat competences as isolated bodies of knowledge, but as integrated combinations of knowledge, skills and attitudes required for personal fulfilment, social inclusion, active citizenship and sustainable living. The framework also emphasises cross-cutting competences such as critical thinking, problem-solving, creativity, communication and collaboration. It explicitly recognises that inquiry-based, project-based, arts-based and game-based learning approaches, alongside experimental STEM learning, can support the simultaneous development of several competences.

A similar logic is reflected in the European Commission's **LifeComp** framework, which provides a common European reference for the development of personal, social and learning-to-learn competences and is explicitly intended to support the design of curricula and concrete learning activities. From this perspective, SPIRIT should not be understood as an isolated methodological initiative, but as a practical contribution to a broader European policy direction in which **quality, inclusion, competence development, learner engagement, well-being and lifelong learning** are increasingly addressed as interconnected dimensions of educational development. The European Education Area similarly places emphasis on more resilient and inclusive education and training systems and on improving access to high-quality education and skills development.

At the same time, SPIRIT deliberately goes beyond an exclusively labour-market-oriented interpretation of "future skills". One of the project's central questions was what kinds of life, social and emotional skills a child who is six years old today will need approximately fifteen years from now in order not merely to be economically successful, but to live a valuable, balanced and meaningful life. Accordingly, the project website approaches future competence development not only from the perspective of employability and labour-market adaptability, but also through social and socio-emotional well-being, connectedness and personal fulfilment.

This dual perspective – **future-readiness and human-centred development** – underpins the entire pedagogical model of SPIRIT.

1.2. The SPIRIT model: ten transversal skills and three pedagogical toolsets

The project's development process was structured around deliberately interconnected phases. During the initial research stage, the partnership explored the knowledge and practices of primary school teachers in

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relation to future skills, active learning, game-based pedagogy and STEAM approaches. Through in-depth interviews with experts in five countries, national research activities and an international synthesis, the partnership developed the competence set on which the SPIRIT comprehensive model was subsequently built. According to the project website, the ten identified skills represent competences that are meaningful for children aged 6–10 and can be deliberately developed through pedagogical interventions.

The ten skills included in the **SPIRIT Framework** are:

Connectedness; Creativity; Critical Thinking; Curiosity, Sense of Wonder and Openness; Emotional Awareness, Regulation and Communication; Empathy; Flexibility; Problem-Solving; Resilience; and Valuing People and Nature.

The project model does not assume that these skills operate as separate or independent areas of development. On the contrary, in authentic learning situations competences interact, reinforce one another and are frequently activated simultaneously within the same activity. Nevertheless, effective development requires an **intentional pedagogical focus**: teachers need to understand which competence they primarily intend to develop, through which learning experience, and which questions, interactions or reflective processes can make this development explicit and meaningful.

To translate the SPIRIT comprehensive model into practice, three complementary Toolboxes were developed:

- **Traditional Games for Skills Development –** the educational use of traditional, offline and board-game-type activities;
- **Learning Activities for Skills Development** – classroom, outdoor and active-learning activities;
- **Gamified STEAM / STEAMified Skills Development** – complex interdisciplinary STEAM programmes based on exploration, experimentation, creation and learning by doing.

The final project structure comprises 30 traditional games, 50 learning activities and 20 complex STEAM programmes. In the Learning Activities Toolbox, five activities are linked to each SPIRIT skill, while the Traditional Games Toolbox includes three games for each competence.

The three toolsets share a common pedagogical rationale, while offering different entry points for teachers. Games provide low-threshold, motivating and socially rich learning situations; learning activities can be integrated more directly into classroom and subject-based teaching; and STEAM programmes connect subject learning with transversal competence development through more complex, interdisciplinary and often longer learning processes. The project therefore does not regard STEAM as an end in itself. Rather, STEAM is understood as a **means of supporting learning and competence development**, rather than as an attractive activity applied for its own sake.

This distinction is fundamental. SPIRIT was not designed as another collection of isolated methods or “good practices”, but as a **coherent pedagogical intervention model** in which age appropriateness, the targeted competence, the learning environment, the selected methodology and reflection are aligned with one another.

1.3. Why was a school pilot necessary?

The quality of a pedagogical resource cannot be assessed solely on the basis of the intentions of its developers or its theoretical coherence. This is particularly true for approaches whose success depends strongly on the age and composition of the learner group, the teacher’s facilitative role, the available time, the physical learning environment, group dynamics and the local curricular context.

The SPIRIT school pilot therefore functioned as an integral **quality assurance and validation mechanism** within the development process. Its purpose was not simply to establish whether individual activities “worked”, but to investigate whether they:

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- were appropriate for the developmental characteristics of children aged 6–10;
- effectively supported the development of the transversal skill or skills assigned to them;
- were able to sustain active learner participation and motivation;
- could be integrated into everyday classroom and school practice;
- involved realistic timeframes and levels of teacher preparation;
- required adaptation for different age groups, learning needs and institutional contexts;
- were influenced by identifiable enabling or constraining implementation factors; and
- required modifications in order to be understandable, safe and effective for other teachers.

Accordingly, project management documentation specified an **eight-week school pilot**, involving at least eight prepared K1–K4 teachers and at least four institutions per partner. Games and STEAM programmes were required to be piloted at least once, while the widest possible piloting of learning activities was encouraged. Teachers were asked to complete a structured feedback form following each implementation, and repeated use of the same Toolbox element generated a new evaluation.

The pilot can therefore be understood as an **iterative development cycle**:

design → implementation → observation → feedback → reflection → refinement → validation

This cyclical approach was essential because the final SPIRIT resources were not intended for a hypothetical "average classroom", but for real European educational contexts. The partnership generated evidence from five distinct educational, cultural and institutional environments – Belgium, Cyprus, Hungary, Italy and Romania/Transylvania. The international pilot therefore also became a means of examining **transferability and adaptability**, making it possible to identify which pedagogical elements performed consistently across national contexts and which required stronger localisation or differentiation.

At the same time, it is important to define clearly what is meant by validation in this report. The SPIRIT pilot was **not a controlled impact study**, nor was it designed to establish causal evidence that a specific activity produces a quantifiable increase in a given competence. Rather, the validation process examined pedagogical relevance, usability, age appropriateness, feasibility of implementation and perceived potential for competence development, drawing primarily on structured professional feedback from practising teachers. In this sense, the project followed a **practice-based and evidence-informed validation** approach.

1.4. The pilot as a participatory and user-centred development process

Within the SPIRIT development logic, pilot teachers were not positioned merely as end users, but as **co-creators and practitioner validators**. This distinction is fundamental.

The first versions of the Toolboxes were developed on the basis of research and professional expertise, but meaningful quality assurance became possible only when teachers began to use these resources in their own classrooms, with their own pupils, under real curricular and organisational conditions. During the pilot, teachers therefore did more than evaluate the individual tools: they adapted, simplified and extended them, linked them to different subjects, modified group organisation, changed rules and timing, and revised reflective questions where necessary.

This approach is consistent with the European policy orientation that regards teachers not simply as implementers of ready-made educational innovations, but as key actors in competence-based teaching and educational change. The Council Recommendation on Key Competences therefore places explicit emphasis not only on competence development itself, but also on supporting education professionals, applying innovative learning approaches and using a variety of learning environments.

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The active-learning perspective presented on the SPIRIT website follows a similar principle: the complexity of learning methods should be adapted to learners' age, needs and existing strengths, while creating an appropriate balance between challenge, participation and manageable collaboration.

The purpose of the pilot was therefore not to establish whether teachers could reproduce Toolbox descriptions without modification. On the contrary, **successful adaptation itself constituted an important element of validation**. The relevant question was whether the pedagogical core of an activity – the mechanism through which the targeted competence was intended to be developed – remained intact across different forms of implementation.

1.5. The role of the Cyprus Validation Meeting: from individual experience to shared European knowledge

The next level of validation following the school pilots was the **SPIRIT Validation Meeting held in Paphos, Cyprus, from 20 to 22 May 2025**. Its pedagogical function went considerably beyond that of a conventional transnational project meeting. The purpose was to compare practical experiences generated in the five participating countries, jointly interpret the Toolbox elements, critically discuss the pilot findings and consolidate the resources professionally before finalisation.

The structure of the meeting itself reflected the pedagogical philosophy of SPIRIT. The first day focused on **Games**, the second on **STEAM Activities**, and the third on **Learning Activities**. Pilot teachers were deliberately placed at the centre of the process: according to the meeting design, teachers were expected to present what they had tested, what they had observed and what they had learned during the pilot, while project partners were primarily expected to participate, listen and contribute to reflection.

The Validation Meeting therefore combined several complementary methods:

- presentation of pilot findings and feedback data;
- hands-on testing of games and learning activities;
- demonstrations of STEAM activities;
- structured peer feedback;
- gallery walks;
- small-group validation discussions;
- question-and-answer sessions and professional debate;
- collaborative framework and template development; and
- formulation of final recommendations and calls to action.

The purpose of the joint evaluation was not to determine whether participants simply "liked" an activity. The discussion focused on concrete professional dimensions such as **student engagement, skills development goals, observed outcomes, age appropriateness, duration, adaptability and applicability**. In the case of the games, for example, presentations were explicitly accompanied by questions concerning how effectively a method could contribute to the development of the ten SPIRIT skills, what forms of learner motivation were observed and what modifications might be required.

The competence focus became even more explicit during the STEAM day. One of the meeting's central messages was that **"the day is not about the STEAM, but about the development of 10 given skills by STEAM activity"**. In other words, STEAM was not treated as a methodological objective in itself, but as a learning environment whose value depends on how intentionally it can be connected to the transversal competences identified by the project.

Accordingly, the main validation questions explored the similarities and differences between STEAM programmes developed in different countries; the clarity of the relationship between individual activities and specific competences; the enabling and constraining conditions affecting their adaptation and

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application; and the practical recommendations that should be provided to teachers who may use the resources in the future.

In this sense, the Paphos meeting represented the transition from **local evidence → transnational peer validation → consolidated European output**.

1.6. Pedagogical lessons from the Cyprus validation process

One of the most important outcomes of the professional work in Paphos was the recognition that competence development is not an automatic consequence of the method being used. A game does not necessarily develop collaboration simply because it is played in a group; a STEAM programme does not automatically develop transversal competences merely because it is motivating or visually impressive; and a learning activity does not necessarily produce reflective learning simply because it requires active participation.

As a result, an **intentional skills development** perspective gradually moved to the centre of the discussions. This requires teachers to understand clearly:

which skill they intend to develop → which learning experience activates it → which facilitative interventions are required → which reflective process makes the experience explicit → and how transfer to other situations can be supported.

The meeting memo records this approach through a series of concrete recommendations from teachers. Recurring themes included thorough preparation, adaptation to the age and needs of the learner group, the importance of research and discovery, links to real-life contexts, active learner participation and the need for follow-up reflection. Participants also stressed that the "A" in STEAM – **Arts** – should not be treated as a decorative addition. It plays a substantive role in divergent thinking, creativity and intrinsic motivation.

The **"WOW → AHA"** principle became a particularly useful expression of this pedagogical insight. The "wow" creates interest, surprise and engagement; the "aha", however, represents interpretation, recognition and learning. The pedagogical objective is therefore not simply to maximise the experiential or entertaining character of an activity. High engagement is necessary, but it is not sufficient. Experience needs to be transformed into a reflected learning process.

The same principle is reflected in the **experience → reflection → transfer** sequence. Questions asked after a game or experiment – What happened? How did we feel? How did we make decisions? What helped the group? What created difficulties? What would we do differently? Where might we encounter a similar situation in real life? – are not optional additions after the activity. They are part of the competence development process itself.

The professional work in Paphos also generated several broader methodological conclusions. The research component of STEAM activities could be strengthened; meaningful connections between subjects are essential; pedagogical objectives and transversal competence goals should not be treated as separate processes but designed as an **integrated pedagogical intervention**; and explicit links to real life are a key factor in the relevance of learning.

All of this reinforces one of the central pedagogical propositions of the SPIRIT model: **competence development is not an alternative to learning content, but a process realised through content, learning situations and pedagogical interaction.**

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1.7. The meaning of validation within the SPIRIT development process

Taken together, the school pilot and the Cyprus Validation Meeting constituted a multi-level quality assurance system. The theoretical model, developers' intentions, teachers' experiences, learner reactions, nationally differentiated implementation practices and transnational professional reflection functioned as mutually informative and mutually corrective sources of evidence.

The purpose of validation was therefore not to ensure that every partner used every resource in exactly the same way. The value of a European educational innovation lies precisely in its ability to **retain stable pedagogical principles while remaining adaptable to different curricular, cultural and institutional environments**. In the case of SPIRIT, standardisation therefore concerns primarily the pedagogical logic rather than a rigid classroom script: the targeted competence, age appropriateness, active engagement, an appropriate level of challenge, reflection, transfer and pedagogical intentionality.

The pilot also established a direct link with subsequent stages of project development. The validated and refined Toolbox elements form the methodological basis for the project's educational resources and support the development of the in-service teacher training programme, the Open Educational Resources and the knowledge-sharing activities of the local and international Communities of Practice. Accordingly, the project website presents the Toolboxes, teacher training and professional communities not as isolated outputs, but as components of an interconnected **capacity-building and exploitation pathway**.

Within this process, the present **Pilot and Validation Report** aims to systematise, compare and interpret the evidence generated by the pilots conducted in the five participating countries. The following chapters therefore go beyond a descriptive summary of questionnaire responses. They seek to identify partnership-level patterns, compare the Games, Learning Activities and STEAM approaches, examine national specificities and divergences, and determine **which elements can be regarded as validated pedagogical principles of the SPIRIT model and in which areas further adaptation, guidance or implementation support is required**.

Validation should therefore not be understood as the end of development, but as its qualitative turning point: the stage at which the model and tools created by the project move from a development concept towards **tested, reflected and transnationally validated educational resources grounded in practical professional experience**.

2. Comparative Analysis of the SPIRIT School Pilot and Validation Results

2.1. Evidence base and analytical approach

The comparative analysis draws on the structured feedback generated during the SPIRIT school pilot in Belgium, Cyprus, Hungary, Italy and Romania/Transylvania, complemented by the evaluation of the international Validation Meeting held in Paphos. The evidence base contains **142 unique pilot implementation records**: **96 evaluations of Games and Learning Activities** and **46 evaluations of STEAM activities**. Within the first group, 42 records relate to Games and 54 to Learning Activities. In addition, 18 participants completed the evaluation questionnaire following the Cyprus Validation Meeting.

The 142 pilot records represent approximately **2,867 pupil participation occasions**: 1,973 in Games and Learning Activities and 894 in STEAM activities. This figure should not be interpreted as the number of unique pupils, since the same learners could participate in more than one pilot activity. Similarly, the unit of analysis throughout this chapter is primarily the **implementation record**, rather than an individual teacher or pupil. Repeated implementation of the same activity was deliberately recorded separately because the project methodology required teachers to provide new feedback after each trial.

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For data quality purposes, an identical duplicate export of the Cyprus STEAM responses was excluded from the analytical dataset. The two Romania/Transylvania STEAM files, by contrast, contain different implementation records and were therefore combined. Responses entered as "not planned" or equivalent in the STEAM competence matrix were treated as non-assessed values rather than low scores.

The analysis combines three complementary perspectives:

- **quantitative descriptive analysis**, using the common 1–5 rating scales;
- **comparative analysis** between the three pedagogical tool types and between national implementation contexts;
- **thematic analysis of open-ended teacher feedback**, including teacher-reported pupil reactions and recommendations for refinement.

The findings should be interpreted within the validation logic described in Chapter 1. The pilot was not designed as an experimental impact study and does not provide causal evidence of measured competence gains. The ratings represent professional judgements by practising teachers concerning pedagogical relevance, feasibility, engagement, age appropriateness and perceived competence-development potential. The strength of the evidence lies in its **practice-based, multi-context and iterative character**: the resources were tested in real educational settings, reflected upon by practitioners, compared across countries and subsequently discussed within an international validation process.

The analysis also deliberately avoids ranking countries. Partners did not pilot identical portfolios of activities or target exactly the same combinations of SPIRIT competences. National differences are therefore interpreted as evidence about **context, adaptation and implementation conditions**, rather than as comparative performance indicators.

2.2. Overall validation: consistently high pedagogical applicability

The first overarching finding is the high level of consistency across the main applicability indicators.

For Games and Learning Activities, all core positive dimensions received average ratings between **4.49 and 4.70 out of 5**. The highest ratings concerned perceived competence development (4.70), willingness to recommend the activity to colleagues (4.69), future use (4.68) and age appropriateness (4.68).

Table 1. Overall applicability of Games and Learning Activities

Dimension	Mean / 5	Ratings of 4 or 5
Appropriate for the age group	**4.68**	93.8%
Develops the intended skill	**4.70**	91.7%
Sustains active participation	**4.55**	90.6%
Exciting and motivating for pupils	**4.57**	**94.8%**
Can be completed within the proposed timeframe	**4.52**	90.6%
Teacher preparation required*	**2.57**	24.0% rated 4–5
Teacher intends to use it again	**4.68**	91.7%
Teacher would recommend it to colleagues	**4.69**	93.8%
Easily integrated into lesson structure	**4.49**	89.4%

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*For teacher preparation, a higher value represents a higher implementation burden and is therefore interpreted differently from the other dimensions.

These results provide strong descriptive support for the **usability and practical relevance** of the first two SPIRIT Toolboxes. Particularly important is the combination of high pedagogical ratings with relatively low preparation requirements. More than half of all Games and Learning Activity records – 54.2% – rated teacher preparation at only 1 or 2 on the five-point scale, while fewer than one quarter rated it at 4 or 5.

The activities were also tested predominantly within formal teaching rather than only in recreational settings. **77 of the 96 implementations (80.2%) took place during lessons**. The proportion was 88.9% for Learning Activities and 69.0% for Games. This distinction is methodologically meaningful: Games retained greater potential for informal or break-time use, while Learning Activities were more consistently embedded in curricular teaching.

The findings therefore validate not only the attractiveness of the materials, but their capacity to function within ordinary educational practice. This is important for the **mainstreaming potential** of the SPIRIT approach. Resources that require extensive additional infrastructure, specialist knowledge or disproportionate preparation may be pedagogically interesting but difficult to transfer into routine school practice. In contrast, the Games and Learning Activities appear to provide relatively low-threshold entry points into intentional transversal skill development.

2.3. Games and Learning Activities: similar outcomes, different pedagogical functions

The comparative results show remarkably small differences between Games and Learning Activities in the dimensions most closely related to pedagogical effectiveness.

Table 2. Games and Learning Activities compared

Dimension	Games	Learning Activities
Age appropriateness	4.67	4.69
Develops the intended skill	4.69	4.70
Active participation	4.55	4.56
Exciting and motivating for pupils	4.60	4.56
Appropriate timeframe	4.62	4.44
Teacher preparation required	2.40	2.70
Teacher intends to use it again	4.74	4.63
Recommendation to colleagues	4.67	4.70
Integration into lesson structure	4.40	4.56

The similarity in perceived competence-development potential – **4.69 for Games and 4.70 for Learning Activities** – is particularly significant for the SPIRIT model. It suggests that transversal skills do not depend on a single preferred pedagogical format. Comparable competence-development intentions can be operationalised through substantially different learning architectures.

The differences that do appear are primarily **functional rather than qualitative**.

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Games were descriptively stronger in relation to time feasibility (4.62 compared with 4.44), required slightly less preparation (2.40 compared with 2.70) and generated marginally higher reported motivation. Learning Activities, on the other hand, fitted somewhat more naturally into lesson structures (4.56 compared with 4.40).

This supports the design logic of the SPIRIT Toolboxes. Games and Learning Activities should not be understood as competing methodologies. They offer **complementary implementation pathways**.

Games can serve as relatively rapid, accessible and motivational entry points into competence-oriented learning. They can be used to create a social challenge, rehearse behaviours, expose pupils to situations requiring flexibility or cooperation, or provide a playful setting in which failure and repetition are acceptable.

Learning Activities more often provide a bridge between transversal competence development and curricular objectives. Their structure allows teachers to embed skills work into mathematics, language learning, environmental studies, visual education or other subject areas without treating competence development as a separate curriculum.

The open-ended responses reinforce this distinction. Games were frequently valued for immediacy, repetition, excitement and willingness to play again. Learning Activities generated more comments concerning curricular adaptation, differentiated task design, discussion, reflection and connections with subject content.

This distinction is useful from a capacity-building perspective: teachers do not need to adopt an entirely new pedagogical system in order to begin working with transversal competences. The SPIRIT resources provide **multiple levels of methodological entry**, allowing practitioners to start with a short game and progress towards more integrated learning designs as confidence and experience increase.

2.4. STEAM: high pedagogical added value accompanied by higher implementation intensity

The STEAM results reveal a somewhat different profile. The pedagogical ratings are at least as strong as those of Games and Learning Activities. Perceived competence development reached an average of **4.76**, with **95.7%** of responses rating this dimension 4 or 5. Motivation averaged 4.70, active participation 4.63 and alignment with pupils' interests and everyday experiences 4.61.

Table 3. Overall applicability of STEAM activities

Dimension	Mean / 5	Ratings of 4 or 5
Appropriate for the age group	**4.63**	91.3%
Develops the relevant SPIRIT skills	**4.76**	**95.7%**
Sustains active participation	**4.63**	91.3%
Exciting and motivating	**4.70**	93.5%
Duration is appropriate	**4.09**	69.6%
Requires substantial teacher preparation*	**3.65**	**56.5%**
Teacher intends to use it again	**4.46**	87.0%
Teacher would recommend it	**4.63**	89.1%
Connects to pupils' interests and everyday life	**4.61**	91.3%

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The difference between pedagogical value and implementation demand is one of the clearest findings of the entire pilot.

Compared with Games and Learning Activities, STEAM received slightly higher ratings for perceived skills development (**4.76 versus 4.70**), motivation (**4.70 versus 4.57**) and active participation (**4.63 versus 4.55**). However, its rating for adequacy of the proposed timeframe was lower (**4.09 versus 4.52**), while teacher preparation requirements were substantially higher (**3.65 versus 2.57**).

The difference in preparation is particularly clear in the distribution of responses. Only **24.0%** of Games and Learning Activity implementations rated preparation requirements at 4 or 5; for STEAM, the corresponding proportion was **56.5%**.

The evidence therefore does not suggest that STEAM is less feasible. Rather, it indicates that STEAM represents a **higher-intensity pedagogical intervention**.

This distinction matters. Complex STEAM activities often require preparation of materials, management of space, coordination between disciplines, longer periods of inquiry or production, differentiated group work and structured reflection afterwards. Several teachers reported that activities originally planned as single sessions worked better when extended over multiple lessons or days. In Cyprus, Hungary and Italy in particular, open responses repeatedly recommended more generous time allocation; Romania/Transylvania similarly identified activities where successful implementation required expansion of the proposed timeframe.

Despite these demands, teachers continued to express strong willingness to reuse and recommend the activities. Future use remained at 4.46 and recommendation at 4.63. The implementation burden therefore did not translate into rejection. Instead, teachers generally considered the additional investment **pedagogically worthwhile when the activity was appropriately structured and connected to explicit learning and competence objectives**.

From a sustainability perspective, this suggests that dissemination of STEAM materials should be accompanied not only by activity descriptions but also by realistic guidance concerning **planning time, resource requirements, sequencing, group organisation and possible modularisation**.

2.5. Engagement is a major strength – but engagement is not equivalent to competence development

Learner engagement emerged as the most consistent positive theme across the entire dataset.

For Games and Learning Activities, **94.8%** of implementation records rated pupil motivation at 4 or 5. For STEAM, the corresponding figure was **93.5%**. Active participation was similarly high: 90.6% for Games and Learning Activities and 91.3% for STEAM.

The qualitative evidence makes these figures tangible. Across countries, teachers reported pupils asking to repeat activities, continuing games during breaks, discussing learning experiences several days later, taking ideas home, reconstructing products outside school, teaching games to pupils from other classes and requesting additional lessons.

These are relevant indicators because they demonstrate more than momentary enjoyment. In several cases, engagement extended beyond the planned activity and generated **continued learner-initiated interaction with the learning experience**.

However, the pilot also provides an important methodological qualification: **high engagement does not automatically imply high-quality competence development**.

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This was particularly visible in highly immersive activities. In the Cyprus pilots, pupils occasionally became so absorbed in experiential or outdoor activities that turn-taking, listening, respect for others or the original learning objective became secondary. Similar tensions appeared elsewhere when competition generated conflict, when complex group work allowed some pupils to dominate, or when fast-moving activities left quieter pupils at the margins.

This distinction is central to the SPIRIT methodology. Engagement functions as an **enabling condition**, not as the final pedagogical outcome.

The evidence therefore supports a progression from:

engagement → structured experience → guided reflection → competence awareness → transfer

rather than assuming:

engagement = learning

This finding also helps refine the interpretation of the frequently reported "wow effect". Surprise, novelty and emotional intensity are powerful mechanisms for attracting attention and creating memorable learning experiences. Yet the validation evidence indicates that the educational value of such experiences depends on what happens afterwards.

The Cyprus Validation Meeting captured this distinction particularly well through the emerging **"WOW → AHA"**principle: the "wow" creates curiosity and emotional involvement, while the "aha" represents conceptual or personal insight.

The SPIRIT methodology therefore benefits from deliberately protecting both phases.

2.6. Reflection and debriefing are part of the intervention, not an optional follow-up

One of the strongest themes in the open-ended responses is the role of reflection.

Teachers repeatedly recommended adding or strengthening:

- guided reflection questions;
- debriefing after games or experiments;
- discussion of feelings and group processes;
- opportunities to identify successful and unsuccessful strategies;
- explicit connections between the activity and the target competence;
- transfer questions connecting the activity to real-life situations.

This was visible across different Toolbox types.

A Hungarian Learning Activity pilot explicitly recommended repeating the activity and then adding a structured reflective discussion in order for its developmental effect to become clearer. In Romania/Transylvania, reflection after a water-filter activity addressed not only the technical experiment but also how pupils felt when their first attempt did not succeed and what helped them eventually achieve the goal. Italian empathy-oriented activities frequently used collective discussion to decode emotions and transform personal experiences into social learning. Cyprus feedback repeatedly highlighted debriefing as essential after highly stimulating STEAM activities.

These examples illustrate a broader methodological point: transversal competences are often **latent within an activity but become pedagogically explicit through reflection**.

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A child may cooperate during a game without being able to identify what effective cooperation involved. A pupil may persist during a difficult construction task without conceptualising that experience as resilience. A group may change strategy without recognising flexibility as the mechanism that enabled success.

The teacher's role is therefore to make the learning process visible without over-directing it.

This suggests a useful SPIRIT implementation sequence:

- **Create an authentic challenge or experience.**
- **Allow pupils to act, experiment, negotiate or fail.**
- **Observe behaviours and group processes.**
- **Facilitate reflection using age-appropriate questions.**
- **Name or recognise the competence where appropriate.**
- **Connect the experience to another context.**

Such an approach is particularly important for primary pupils, for whom abstract competence terminology may be less meaningful than concrete experiences. The activity provides the experiential reference point; reflection allows that experience to become transferable knowledge about oneself, others and problem-solving processes.

2.7. The main implementation constraint is time – but "more time" does not mean lower efficiency

The quantitative results identify **time** as the clearest implementation challenge, particularly in STEAM.

While Games and Learning Activities received an average of 4.52 for completion within the proposed timeframe, STEAM activities averaged 4.09, and only **69.6%** received ratings of 4 or 5 on this dimension.

Open-ended responses explain why.

In many cases, activities extended beyond the expected duration not because the design failed, but because:

- pupils became deeply engaged;
- different groups progressed at different speeds;
- construction or creative work required additional iterations;
- teachers introduced meaningful reflective discussions;
- research or investigation generated new questions;
- pupils needed additional scaffolding;
- activities developed productive links with other subjects;
- a final product required more time than anticipated.

This creates an important distinction between **time overrun as implementation failure** and **time expansion as pedagogical depth**.

For example, several Hungarian STEAM pilots concluded that activities worked better when distributed across two or more sessions. Italian teachers similarly described fixed time allocations as potentially reductive when pupils were productively engaged in complex tasks. Cyprus feedback suggested that immersive activities could justify several lessons if they were connected more systematically to curricular content.

The resulting recommendation should therefore not simply be to shorten STEAM activities.

A more appropriate design principle is **modularity**.

Complex activities should clearly distinguish:

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- essential core stages;
- optional extensions;
- reflection components;
- possible stopping points;
- elements suitable for a second lesson;
- alternative versions for younger and older groups.

Such modularisation supports both implementation fidelity and teacher autonomy. It enables practitioners to retain the pedagogical mechanism of the activity while adapting its scale to local timetable constraints.

2.8. Adaptability is not a weakness of the model; it is one of the strongest validation outcomes

The pilot generated numerous examples in which teachers modified activities during implementation.

These adaptations included:

- reducing the size of a game board;
- simplifying rules;
- altering vocabulary for younger pupils;
- changing materials;
- transferring an activity to another subject;
- introducing movement into an otherwise static task;
- dividing a long activity across several lessons;
- adding visual support;
- modifying group composition;
- introducing additional roles;
- adding reflection questions;
- increasing or decreasing complexity;
- changing the physical learning environment.

Importantly, these adaptations were usually described as improvements rather than indications that the original resource was unusable.

The Belgian Dixit pilot provides a particularly clear example. In one implementation, the original format was perceived as linguistically demanding and received ratings of 3 on several dimensions and 2 for time feasibility. A subsequent implementation modified the rules and produced substantially stronger ratings, including 5 for skill development, time feasibility, future use and recommendation.

The Hungarian Reversi feedback similarly indicated that a full-size board could be cognitively demanding for younger or slower-processing pupils and proposed a smaller playing field. Italian activities were repeatedly extended into foreign-language learning, literature or emotional education. Romania/Transylvania teachers adapted movement, mathematics, programming and construction tasks to pupil age and available resources.

These findings are highly relevant to the **transferability** of the SPIRIT model.

In European cooperation projects, transferability cannot reasonably mean identical replication across different education systems, age groups and school environments. A more robust interpretation is **adaptive fidelity**: maintaining the pedagogical core of an intervention while allowing contextual modification.

The pilot indicates that teachers were generally capable of doing this successfully.

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The practical implication is that future SPIRIT materials should make this flexibility explicit. Activity descriptions can distinguish between:

- **core pedagogical elements** that should be retained, and
- **adaptable implementation variables**, such as duration, materials, group size, subject context or level of complexity.

This can reduce the risk that teachers either follow instructions too rigidly or modify an activity so extensively that its competence-development logic becomes unclear.

2.9. Differentiation and age appropriateness require more than assigning an age range

Age appropriateness received very strong ratings across both major datasets: 4.68 for Games and Learning Activities and 4.63 for STEAM. Nevertheless, the open-ended feedback shows that age appropriateness is not a fixed characteristic of an activity. It is partly produced through **teacher adaptation and scaffolding**.

Several recurring mechanisms were identified:

- younger pupils required simpler rules;
- abstract vocabulary needed to be reduced or made concrete;
- mixed-age groups required more explicit role allocation;
- complex tasks benefited from visual or physical scaffolds;
- some games required smaller playing fields;
- younger pupils needed more modelling before independent work;
- older or more advanced pupils could be given additional responsibility or more demanding tasks.

The Romania/Transylvania “human robot” activity is illustrative: for younger children, teachers proposed using a visible grid in which one square represented one step, thereby turning an abstract sequence of instructions into a spatially accessible planning task.

Belgian teachers similarly identified language demands as an important variable in activities such as Dixit. Hungarian teachers repeatedly differentiated games by reducing complexity, selecting age-appropriate vocabulary or allowing pupils to move progressively through levels of difficulty.

These results suggest that **age appropriateness should be understood as a design relationship between activity, learner and scaffolding**, rather than simply as an age label attached to a resource.

This is particularly important for inclusive implementation. The same principle can be extended beyond chronological age to different levels of language proficiency, attention, confidence, prior knowledge and learning pace.

2.10. Collaboration is both a learning mechanism and a point of pedagogical risk

Collaboration was one of the strongest characteristics identified in the STEAM evaluations, with an average rating of **4.53**. Approximately 84% of valid responses rated the collaborative dimension at 4 or 5.

The qualitative evidence also repeatedly describes peer support, shared problem-solving, trust, role distribution and collective decision-making.

However, the same data demonstrate that group work should not be treated as automatically inclusive.

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Teachers reported situations in which:

- dominant pupils assumed disproportionate control;
- quieter pupils withdrew;
- some group members did not feel important;
- existing interpersonal tensions became visible;
- competition generated conflict;
- mixed-age groups created uneven participation;
- pupils needed explicit support in turn-taking and listening.

This apparent contradiction is pedagogically productive.

Collaborative activities often **make social competences observable precisely because they expose difficulties in collaboration**. Conflict, uneven participation or unsuccessful coordination are not necessarily evidence that a collaborative activity has failed. They can become authentic material for developing empathy, communication, flexibility, resilience and connectedness – provided that teachers recognise and process them.

This again reinforces the role of reflection and facilitation.

Several practical strategies emerged from the pilot:

- assign and rotate explicit roles;
- use buddy systems;
- provide responsibility to advanced pupils without allowing them to dominate;
- establish turn-taking routines;
- monitor physical access to shared materials;
- use smaller groups for complex activities;
- stop and reflect when group dynamics become pedagogically relevant.

From an inclusion perspective, successful collaboration requires **participation architecture**. The activity must create not merely a group but meaningful opportunities for every pupil to contribute.

2.11. STEAM strongly supports exploration and curiosity, but learner agency can be strengthened

The STEAM questionnaire included a second set of items assessing whether activities displayed characteristics associated with the SPIRIT interpretation of active and experiential STEAM learning.

The profile is revealing.

The piloted STEAM activities were particularly strong in **learning by doing**, **interest-driven learning**, **safe experimentation**, **learning from mistakes**, collaboration and flow. These characteristics are consistent with the high motivation and competence-development ratings presented earlier.

At the same time, **learner agency** received the lowest mean score, at 3.96.

A score close to 4 is not weak in absolute terms. Its significance lies in its position relative to the other dimensions.

The evidence suggests that many SPIRIT STEAM activities successfully create active, motivating and exploratory learning environments, but that active participation does not always amount to **genuine learner ownership**.

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Table 4. Pedagogical characteristics of the piloted STEAM activities

STEAM characteristic	Mean / 5
Learning by doing, exploring and experimenting	**4.61**
Safe environment for addressing failure	**4.61**
Interest-driven learning	**4.59**
Creates flow and sustained engagement	**4.57**
Collaboration and open communication	**4.53**
Opportunities to learn from mistakes	**4.50**
Uses varied active-learning methods	**4.43**
Learning through play	**4.24**
Puts children in the “driver’s seat”	**3.96**

A pupil may actively construct something while following a teacher-defined process. A group may be highly engaged in an experiment while having limited influence over the question being investigated. Learners may participate intensively without making substantive decisions about strategy, materials, task sequence or final product.

This leads to another important distinction:

active learning ≠ learner agency

Strengthening agency does not require removing teacher guidance. Particularly for younger pupils, excessive openness can increase cognitive load or reduce the clarity of learning goals. Rather, agency can be developed through **bounded choice**:

- allowing pupils to select materials;
- offering alternative solution pathways;
- enabling groups to formulate hypotheses;
- allowing learners to design part of an investigation;
- letting pupils choose roles;
- encouraging different final products;
- asking learners to decide how they will test or improve a solution.

The Italian STEAM responses provide several examples of relatively high learner ownership, reflected also in an average national learner-agency rating of 4.44. One activity led pupils to move from a theoretical robot design to an independently constructed physical version using materials they sourced themselves. Similar patterns appeared in Hungarian and Transylvanian activities when pupils designed routes, adapted constructions or developed their own creative extensions.

The data therefore identify learner agency as a promising area for further methodological refinement rather than a structural weakness.

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2.12. Learning from failure is one of the most valuable but less visible SPIRIT mechanisms

Two STEAM characteristics received particularly high scores:

- creating a safe environment for failure: 4.61;
- providing opportunities to learn from mistakes: 4.50.

These results deserve specific attention because they connect directly to several SPIRIT competences, particularly **Resilience, Flexibility, Problem-Solving and Emotional Awareness**.

The qualitative responses show how these mechanisms operate.

Construction activities failed on first attempts. Groups had to redesign solutions. Rules changed. Materials behaved differently than expected. Pupils had to accept suggestions from other groups. Some learners became frustrated and then re-engaged. Teachers used unsuccessful attempts as discussion points.

This is an important strength of experiential learning.

In conventional classroom settings, error can easily be interpreted as evidence of insufficient performance. In many of the piloted SPIRIT activities, error became **information within the learning process**.

This shifts the pedagogical question from:

“Was the answer correct?”

towards:

“What happened, why did it happen, and what can we change?”

This mechanism is particularly relevant to the project’s broader understanding of future skills. Resilience is not developed by avoiding difficulty, and problem-solving is not developed through tasks in which the solution is immediately obvious. Effective competence development requires **manageable uncertainty and recoverable failure**.

The pilot evidence suggests that many SPIRIT activities create precisely such conditions.

2.13. The ten SPIRIT competences within the STEAM pilots

The STEAM feedback form asked teachers to assess the contribution of activities to the ten SPIRIT competences. The results were generally high, although they should be interpreted carefully because national partners deliberately developed and piloted different competence portfolios.

It would be methodologically inappropriate to interpret this table as a ranking of the intrinsic suitability of STEAM for different competences. The sample was not designed for such a comparison.

Nevertheless, the profile supports several useful observations.

First, **Creativity and Curiosity/Sense of Wonder** were the most consistently recognised competence dimensions. This aligns closely with the qualitative reports of experimentation, surprise, discovery, construction, outdoor exploration and learner-generated solutions.

Second, the high ratings for **Flexibility, Problem-Solving and Critical Thinking** reflect the iterative nature of many STEAM tasks. Pupils were frequently required to change strategy, interpret evidence, deal with unexpected outcomes or move between theory and practical construction.

Third, lower relative ratings for Empathy should not be interpreted as evidence that STEAM is unsuitable for developing empathy. The Italian pilots, for example, deliberately connected STEAM with emotional awareness, nature and empathy and generated rich evidence in precisely these areas. The aggregated

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figure partly reflects the fact that other national STEAM portfolios focused more strongly on different competences.

This is an important methodological lesson for the SPIRIT model: **the pedagogical format does not determine the competence automatically**. The same STEAM mechanism can support different transversal skills depending on framing, facilitation and reflection.

Table 5. Perceived contribution of STEAM activities to SPIRIT competences

SPIRIT competence	Mean / 5*
Creativity	4.72
Curiosity and Sense of Wonder	4.69
Flexibility	4.50
Problem-Solving	4.42
Critical Thinking	4.41
Connectedness	4.41
Resilience	4.35
Emotional Awareness	4.29
Valuing People and Nature	4.29
Empathy	4.14

*Calculated from valid numerical ratings only; competences marked as not planned/not assessed were excluded.

2.14. Concrete experience, movement and real-life relevance amplify the learning process

Across all five national contexts, teacher comments repeatedly associated successful implementation with **concrete experience**.

Examples included:

- working with natural materials and physical objects;
- movement and outdoor learning;
- construction and manipulation;
- simulations and role-based scenarios;
- real-life problems;
- familiar local environments;
- sensory exploration;
- artistic production;
- tangible visualisation of abstract concepts.

The Belgian Macro-Mikado pilot combined outdoor collection of materials with mathematical extension possibilities. Hungarian STEAM activities used forests, school grounds, measurement, art and storytelling. Italian activities connected emotional development with nature, literature, movement and construction. Romania/Transylvania pilots used water filtration, physical bridge construction and embodied

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programming. Cyprus used bubbles, paper-making, simulations, experiments and classroom transformation.

These examples suggest that the strength of the SPIRIT approach is not simply “activity” in contrast to “instruction”. The more relevant distinction is between **abstract exposure and meaningful embodied experience**.

Concrete experience appears to support several mechanisms simultaneously:

- it increases engagement;
- it provides shared reference points for discussion;
- it makes abstract concepts visible;
- it generates authentic problems;
- it creates opportunities for peer interaction;
- it supports memory;
- it creates emotional investment.

This helps explain why the combination of **real-life connection + interdisciplinary learning + hands-on experience**recurs so strongly across the pilot evidence.

2.15. The teacher remains central: learner-centred does not mean teacher-light

A further cross-cutting conclusion concerns the role of the teacher.

The SPIRIT approach is learner-centred, but the pilot provides no evidence that learner-centred methods reduce the need for pedagogical expertise. In several respects, they increase it.

Teachers need to:

- select an appropriate challenge level;
- prepare materials and environments;
- anticipate group dynamics;
- scaffold difficult tasks;
- identify when intervention is necessary;
- recognise when productive struggle becomes disengagement;
- facilitate reflection;
- connect experience with curricular content;
- differentiate between learners;
- manage time flexibly;
- preserve the competence-development intention of the activity.

This becomes particularly visible in STEAM. The higher preparation rating of **3.65**, compared with 2.57 for Games and Learning Activities, reflects not only logistical work but the complexity of orchestrating the learning process.

Several responses explicitly suggested the value of **co-teaching or an additional adult** for more complex activities. Cyprus teachers described some paper-making and experimental sessions as difficult for one teacher to supervise effectively. Italian feedback similarly noted the value of two teachers when monitoring multiple groups in emotionally or socially complex activities.

This finding has implications for implementation guidance. Teacher support should not focus exclusively on providing ready-made activities. Capacity-building should also develop competence in **facilitation, questioning, reflection, differentiation and learning design**.

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In this respect, the SPIRIT Toolbox and the SPIRIT teacher-training component are structurally connected: the resources provide the pedagogical opportunity, while professional development supports teachers in converting that opportunity into intentional competence development.

2.16. Cross-country convergence is stronger than national divergence

Although the national datasets differ in size and competence focus, the overall pattern is characterised more by convergence than divergence.

Across all participating contexts, teachers generally identified:

- strong pupil engagement;
- positive competence-development potential;
- high willingness to reuse resources;
- high willingness to recommend them to colleagues;
- a need for adaptation to age and group composition;
- the importance of sufficient time;
- the value of reflection and discussion;
- the need for clear structures in complex activities.

Differences are nevertheless informative.

Belgian feedback tended to be more differentiated and critical in relation to language accessibility, duration and activity structure. For Games and Learning Activities, perceived skill development averaged 4.19, compared with a partnership-wide average of 4.70. However, the open responses show active adaptation rather than rejection: difficult resources were simplified, made more concrete or made more active.

Cyprus generated particularly rich feedback concerning **implementation architecture**: feedback loops, mixed-age groups, debriefing, classroom management, teacher prompting, role allocation and the relationship between immersion and structure. This was also the context in which the distinction between high excitement and explicit competence development became particularly visible.

Hungary generated the largest Games/Learning Activity dataset and showed very high perceived skill development (4.94). The qualitative evidence demonstrates extensive teacher-led adaptation, including differentiation, transfer to different subjects and creation of new variants.

Italy presented a particularly strong social-emotional profile, especially around empathy, emotional awareness, communication and self-regulation. It also showed comparatively high learner agency within STEAM (4.44), while repeatedly identifying time as a variable that should remain flexible.

Romania/Transylvania produced only five Games/Learning Activity records, and therefore conclusions from that subset must remain cautious. Its STEAM sample was larger, with ten records. Here perceived skill development reached 5.00, while preparation requirements also reached the highest national mean, at 4.40. This combination illustrates particularly clearly the relationship between **high perceived pedagogical value and high implementation intensity**.

The cross-country picture therefore supports a central European added-value claim of the project: the same underlying competence-development logic can operate in different educational contexts, but **implementation needs to remain locally responsive**.

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2.17. Outliers are particularly valuable for validation

The validation value of the pilot does not lie only in high average scores. Activities that received lower ratings provide particularly useful information about the conditions under which an intervention succeeds or fails.

Two examples illustrate this.

In the Belgian Dixit pilot, one implementation received ratings of 3 for age appropriateness, competence development, participation and motivation, and 2 for time feasibility. Teacher feedback identified language demands and the complexity of the original rules as the main barriers. A modified version simplified the rules and produced substantially stronger results.

The conclusion is not that Dixit was either "validated" or "rejected". The pilot identified an **implementation condition**: for younger or linguistically less confident pupils, adaptation is necessary.

A Cyprus implementation of Spaghetti Marshmallow produced one of the lowest STEAM profiles, including 2 for active participation and interest fit and several ratings of 3. The qualitative feedback explained that mixed ages, insufficient structure and lack of a strong challenge framework reduced participation. The teacher explicitly observed that the same type of activity worked more effectively when placed within a clearer group challenge with specific objectives, time pressure and teacher prompting.

Again, the important outcome is not a negative score. It is the identification of the **pedagogical mechanism required for the activity to work**.

This is exactly the purpose of validation.

A mature validation process should not remove all negative or ambiguous results. It should use them to specify conditions of successful implementation.

2.18. Validation of the validation process: evidence from the Paphos meeting

The Cyprus Validation Meeting provided a second layer of evidence by bringing together pilot teachers and partner representatives to compare experiences and jointly refine the outputs.

The meeting itself received a very high overall evaluation: **9.28 out of 10** from 18 respondents. Ten participants (55.6%) rated it 10/10, four rated it 9, three rated it 8 and one rated it 7.

The strongest four-point-scale dimensions were:

- location and logistics: **3.78/4**;
- joint work, communication and cooperation: **3.72/4**;
- support from the host partner: **3.72/4**.

More importantly for methodological learning, the relatively weaker dimensions concerned preparation:

- receiving the agenda sufficiently early: **3.06/4**;
- having sufficient time to understand meeting tasks: **3.11/4**;
- clarity and conciseness of prior information: **3.17/4**.

Open comments reinforced these findings. Participants requested:

- earlier preparation;
- clearer shared definitions;
- more consistent templates;
- more reflection time;
- more opportunity to discuss activities in depth;

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- greater alignment of terminology between partners.

At the same time, several respondents explicitly identified the participation of pilot teachers, practical demonstrations and transnational knowledge sharing as the strongest aspects of the meeting.

This provides a useful form of **triangulation**.

The international validation process reproduced many of the same methodological lessons that emerged from the classroom pilot:

clarity matters; structure matters; reflection requires time; shared terminology matters; practical experience is more powerful when followed by collective interpretation.

The validation meeting therefore did more than confirm the Toolbox results. It also helped consolidate the methodological principles required to communicate and scale them.

2.19. Comparative synthesis: what has been validated?

Taken together, the evidence supports several robust conclusions.

First, the **pedagogical core of the SPIRIT model is strongly supported by practitioner feedback**. Across 142 pilot implementation records, age appropriateness, learner engagement, competence-development potential, future use and professional recommendation were consistently rated highly.

Second, the three Toolboxes perform different but complementary functions. Games provide accessible, motivating and relatively low-preparation competence-development opportunities. Learning Activities integrate transversal skills particularly effectively into ordinary lesson structures. STEAM creates richer, highly engaging interdisciplinary learning environments but requires greater preparation, flexible timing and more sophisticated facilitation.

Third, **engagement is a necessary but insufficient condition for competence development**. The strongest activities create curiosity and emotional involvement, but their developmental value depends on intentionality, facilitation, reflection and transfer.

Fourth, **adaptability is a core strength of the SPIRIT resources**. Teachers repeatedly modified activities successfully while retaining their pedagogical purpose. The validation therefore supports a model of adaptive fidelity rather than rigid replication.

Fifth, **time and teacher preparation are the principal implementation constraints**, especially for STEAM. These constraints can be reduced through modular activity design, reusable templates, clearer implementation guidance, age-specific alternatives and professional development.

Sixth, **collaboration and failure are productive learning mechanisms when deliberately facilitated**. Group difficulty, unsuccessful attempts and changes of strategy provide authentic opportunities for developing resilience, flexibility, empathy, communication and problem-solving.

Seventh, the STEAM evidence suggests that **learner agency is an area with further development potential**. The activities are highly active and exploratory, but future versions can create more opportunities for pupils to make meaningful decisions within appropriately structured boundaries.

Finally, the evidence supports the central methodological principle articulated during the Cyprus validation process:

the objective is not to add a game, a learning activity or a STEAM exercise to a lesson; the objective is to design an intentional learning experience in which curricular learning and transversal competence development reinforce one another.

This distinction is central to the scalability and sustainability of the SPIRIT approach.

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The pilot therefore validates more than a collection of individual resources. It validates a broader **competence-oriented pedagogical logic**:

meaningful experience → active participation → manageable challenge → reflection → competence awareness → adaptation and transfer.

Within this logic, the "wow" moment has value because it opens the learner to experience; the "aha" moment has value because it transforms that experience into learning.

The evidence from five national contexts suggests that this process can be achieved through different pedagogical forms, different subjects and different learning environments. This combination of a **stable competence-development rationale and flexible local implementation** constitutes one of the strongest outcomes of the SPIRIT validation process.

3. Country-level analysis of the SPIRIT school pilot

3.1. Interpreting the national results

The national analyses complement the partnership-level findings presented in Chapter 2. Their purpose is **not to rank participating countries**, but to identify how the common SPIRIT pedagogical model operated under different educational, cultural and institutional conditions.

The national datasets differ in size and composition. Moreover, partners did not pilot identical portfolios of Games, Learning Activities and STEAM activities, nor did they place equal emphasis on the same transversal competences. Differences in national averages must therefore be interpreted primarily as evidence about **implementation conditions, pedagogical adaptation and national pilot focus**, rather than comparative performance.

Across the five contexts, the central question remains the same:

How did teachers translate the common SPIRIT competence-development logic into authentic local educational practice?

3.2. Belgium

The Belgian evidence base comprises **24 pilot records: 16 Games and Learning Activities and 8 STEAM implementations**. Compared with several other national datasets, Belgian responses were particularly differentiated and critical. This makes the Belgian pilot valuable from a validation perspective: teachers did not merely confirm the applicability of resources, but frequently identified specific conditions under which activities needed to be modified.

Highlights

- **24 documented implementations**
- Strong focus on **Problem-Solving, Critical Thinking and Creativity**
- Games and Learning Activities: perceived skill development **4.19/5**
- STEAM duration: **3.50/5**, indicating a clear need for more realistic timing
- STEAM learner agency: **3.00/5**, the clearest national indication that active participation should be complemented by stronger pupil ownership
- Particularly rich evidence on **language accessibility, age differentiation and adaptation**

Belgian teachers repeatedly highlighted the importance of matching task complexity to pupils' age, language proficiency and prior experience. Activities could be highly motivating while still requiring modification. Dixit provides the clearest example: one implementation revealed that the original rules and some of the verbal demands were too difficult for younger pupils. The teacher simplified the mechanism

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and turned it into a more cooperative storytelling task. The adapted version subsequently produced substantially stronger applicability ratings.

This is an important validation result. The Belgian pilot demonstrates that lower initial ratings need not indicate that the pedagogical concept is unsuitable. Rather, they can reveal the **adaptation threshold** of an activity.

A similar pattern can be observed in other responses. Teachers suggested adding movement to relatively static activities, reducing linguistic complexity, providing more breaks in longer sessions and using alternative materials where access to outdoor resources might be difficult.

The Belgian STEAM results reinforce this critical perspective. Activities were generally considered valuable, but timing and learner ownership were less consistently strong than engagement itself. In other words, pupils were often **active without necessarily being fully in control of the learning process**.

The national pedagogical pattern can therefore be summarised as:

activity → critical observation → simplification or restructuring → improved accessibility

Belgium contributes a particularly important message to the overall SPIRIT validation: **pedagogical quality is strengthened when adaptation is treated as part of implementation rather than as deviation from the original design**.

3.3. Cyprus

The Cyprus dataset contains **32 pilot records: 22 Games and Learning Activities and 10 STEAM implementations**. It combines very high overall acceptance with some of the richest qualitative reflection in the partnership.

Highlights

- **32 documented implementations**
- Very high professional acceptance of Games and Learning Activities
- Future use: **4.95/5**
- Recommendation to colleagues: **4.95/5**
- Strong evidence concerning **debriefing, classroom management and mixed-age implementation**
- Cyprus particularly exposed the distinction between **high engagement and intentional competence development**

The Cypriot results show that teachers regarded the SPIRIT resources as highly reusable and professionally relevant. Almost universal willingness to use the piloted Games and Learning Activities again is especially important because future-use intention reflects more than satisfaction: it provides an indicator of perceived **practical sustainability**.

At the same time, the open-ended feedback is notably reflective. Teachers repeatedly analysed how group structure, age differences, physical space, teacher prompting and post-activity discussion affected outcomes.

Highly immersive activities provided particularly useful evidence. Pupils could become so engaged in experiments or outdoor experiences that the intended social or competence-development objective temporarily became less visible. Teachers therefore stressed the importance of establishing clear rules, structured feedback loops and sufficiently strong debriefing.

The Spaghetti Marshmallow activity illustrates the point. Lower ratings were not attributed to the general concept of construction-based problem-solving, but to the implementation architecture: mixed ages,

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insufficiently explicit challenge structures and limited teacher prompting reduced participation. The response effectively identified how the same activity could be strengthened through clearer objectives, time boundaries and group roles.

Cyprus also generated practical recommendations concerning **additional adult support or co-teaching** for more complex STEAM activities, particularly where several groups require simultaneous supervision.

The national validation logic can therefore be expressed as:

immersion → observation of group processes → structured facilitation → reflection → explicit competence learning

Cyprus makes one of the strongest contributions to the SPIRIT principle of **intentionality**. The pilot demonstrates that powerful experiences are not enough in themselves. The teacher must help pupils move from the experience towards recognising what they did, why it worked, what they felt and where the same competence may be required again.

This national evidence strongly supports the project-wide **WOW → AHA** interpretation developed during the Paphos Validation Meeting.

3.4. Hungary

Hungary produced the largest national pilot dataset, comprising **43 documented implementations: 34 Games and Learning Activities and 9 STEAM activities**. The results show both very high perceived applicability and extensive practitioner-led adaptation.

Highlights

- **43 documented implementations – the largest national dataset**
- Games and Learning Activities: perceived skill development **4.94/5**
- Games and Learning Activities: time feasibility **4.82/5**
- Strong national emphasis on **Resilience and Flexibility**
- Extensive teacher-generated adaptation and transfer across subject areas
- STEAM preparation requirement: approximately **4.00/5**
- Recurrent recommendation to **divide complex STEAM activities into several learning sessions**

The Hungarian Games and Learning Activities generated particularly strong quantitative results. Teachers considered the activities highly effective for their intended skills, and the proposed timeframes generally worked well.

The more distinctive finding, however, emerges from the qualitative evidence. Hungarian teachers frequently **appropriated and further developed** the activities rather than treating the Toolbox descriptions as fixed scripts. They altered complexity, changed rules, connected activities to different curricular areas, proposed alternative group formats and designed extensions for different age groups.

This demonstrates an important aspect of scalability: the resources were sufficiently structured to communicate a pedagogical intention, while remaining open enough to support professional teacher judgement.

The Hungarian STEAM evidence reveals a different implementation profile. Pedagogical acceptance remained high, but preparation requirements increased substantially. Teachers described material preparation, organisation, interdisciplinary planning and timing as real workload factors. Several implementations led to the conclusion that complex activities were better organised over more than one session.

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This should not be read as an implementation deficit. In several cases, additional time was required precisely because pupils were exploring, constructing, measuring, discussing or extending the task beyond its minimum form.

The Hungarian pattern can therefore be summarised as:

clear pedagogical core → teacher adaptation → curricular integration → further development

This is particularly significant for the exploitation potential of SPIRIT. The national evidence suggests that teachers were not simply able to reproduce the resources, but were able to **generate new pedagogical possibilities from them**.

Hungary therefore provides strong evidence for the concept of **adaptive fidelity**: the competence-development objective remains stable while the concrete classroom implementation evolves according to learner needs and curricular opportunities.

3.5. Italy

The Italian evidence base contains **28 pilot records: 19 Games and Learning Activities and 9 STEAM implementations**. The Italian pilot developed a particularly distinctive profile around **Empathy, Emotional Awareness, Regulation and Communication**, while also showing how these dimensions can be integrated with active and STEAM learning.

Highlights

- **28 documented implementations**
- Strongest national emphasis on **social-emotional competence development**
- Recurrent focus on **Empathy, Emotional Awareness and Communication**
- STEAM learning by doing: **4.78/5**
- STEAM learner agency: **4.44/5**, among the strongest national results
- Particularly rich connections between **body, emotion, nature, creativity and reflection**

Italian teachers frequently interpreted transversal skill development through emotional and relational processes. Activities included mindfulness, empathy exercises, nature-based experiences, creative production and tasks in which pupils were required to recognise, express or discuss emotions.

This provides useful evidence for the breadth of the SPIRIT model. Active learning and STEAM are sometimes understood primarily through technical construction, experimentation or problem-solving. The Italian pilot demonstrates that they can also create meaningful contexts for **social and emotional learning**, provided that these goals are intentionally designed into the activity.

Learner ownership was comparatively strong in the Italian STEAM sample. In several activities, pupils moved beyond following instructions towards choosing materials, developing solutions and transforming initial ideas into independently produced outcomes. This is consistent with the relatively high national score for placing pupils in the “driver’s seat”.

Reflection nevertheless remained essential. Teachers repeatedly used collective discussion to transform individual emotional or experiential reactions into shared learning. The developmental mechanism was therefore not limited to experiencing an emotion, but extended towards **recognising, communicating and interpreting it in relation to others**.

As elsewhere, time emerged as a practical issue. Italian feedback often resisted overly rigid timeframes when pupils were productively engaged. The recommendation was therefore generally to retain pedagogical depth and allow activities to develop flexibly rather than forcing completion according to an artificial schedule.

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The national pattern can be summarised as:

experience → emotional engagement → expression → collective reflection → social learning

Italy therefore extends the SPIRIT validation beyond cognitive interpretations of future skills. It demonstrates that future-readiness also includes the ability to understand oneself, recognise others, communicate emotional experience and participate constructively in relationships.

3.6. Romania / Transylvania

The Romanian/Transylvanian evidence requires somewhat different interpretation because the two Toolbox groups have substantially different sample sizes. Only **5 Games and Learning Activity records** were available, while the STEAM dataset contains **10 implementations**, resulting in **15 national pilot records overall**.

The Games and Learning Activity subset should therefore not be used to draw broad national conclusions. The STEAM evidence, however, is sufficiently substantial to identify a number of consistent patterns.

Highlights

- **15 documented implementations**
- STEAM perceived skill development: **5.00/5**
- Active participation: **4.90/5**
- Motivation: **4.90/5**
- Teacher preparation requirement: **4.40/5**, the highest national mean
- Strong practical examples of **age-specific scaffolding and embodied learning**

The Romanian/Transylvanian STEAM pilots combine extremely high perceived educational value with the highest reported preparation demand. This provides perhaps the clearest national illustration of an important partnership-level finding:

high pedagogical value and high implementation intensity can coexist.

Activities included concrete experimentation, construction, embodied programming and environmental problem-solving. Examples such as water filtration, bridge-building and the “human robot” activity created tangible challenges in which abstract principles became observable and manipulable.

Teachers provided particularly useful recommendations concerning **scaffolding for younger pupils**. In the human robot activity, for example, the use of a visible grid was proposed so that one square could correspond to one movement. This converted an abstract programming sequence into an age-appropriate spatial problem.

The water-filtration pilot also demonstrates the pedagogical use of failure. In one implementation, timing and future-use ratings were relatively low despite enthusiastic pupil reactions. The value of the activity emerged partly from unsuccessful attempts and subsequent discussion about what had gone wrong, how pupils felt and what they changed.

This reinforces the SPIRIT understanding of failure as a learning resource rather than merely an undesirable result.

The national process can therefore be represented as:

concrete challenge → experimentation → difficulty or failure → scaffolding → revised strategy → reflection

The Romanian/Transylvanian experience is especially relevant to the design of implementation guidance. Complex STEAM tasks can be highly effective with younger pupils, but their accessibility depends on **carefully designed intermediate supports**, realistic preparation and sufficient time.

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3.7. Cross-country highlights

Despite different national emphases, the five country profiles converge around a common pedagogical core.

- Belgium demonstrates the importance of **accessibility and adaptation**.
- Cyprus demonstrates the importance of **intentional facilitation and reflection**.
- Hungary demonstrates the potential for **teacher-led adaptation and curricular transfer**.
- Italy demonstrates the integration of **social-emotional learning, learner agency and experiential methodology**.
- Romania/Transylvania demonstrates the importance of **scaffolding, learning through challenge and realistic implementation support**.

These national emphases can be brought together into a common SPIRIT implementation pathway:

→ accessible activity
→ meaningful challenge
→ active participation
→ teacher facilitation
→ adaptation where necessary
→ reflection
→ recognition of the transversal skill
→ transfer to new contexts

The differences between countries therefore strengthen rather than weaken the validation of the SPIRIT model. They demonstrate that a common pedagogical rationale can produce meaningful learning opportunities across different educational settings without requiring identical classroom practice.

This is a particularly relevant finding from a European cooperation perspective. **Transferability does not require uniformity.** The evidence instead supports a model in which shared principles are combined with contextual professional judgement.

The country-level analysis therefore reinforces the broader conclusion of the validation process: SPIRIT functions most effectively not as a prescriptive collection of activities, but as a **flexible, competence-oriented pedagogical framework supported by practical resources and informed teacher facilitation**.

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4. Conclusions, lessons learnt and recommendations for finalisation and implementation

4.1. Overall conclusion of the validation process

The SPIRIT pilot and validation process provides a coherent body of practice-based evidence supporting the **pedagogical relevance, usability, adaptability and transferability** of the three SPIRIT Toolboxes.

Across 142 documented pilot implementations in five national contexts, teachers consistently reported high levels of age appropriateness, learner motivation, active participation, perceived contribution to transversal competence development and willingness to use or recommend the resources again. At the same time, the validation process generated sufficiently differentiated critical feedback to move beyond a simple satisfaction-based assessment.

The evidence therefore supports a more substantive conclusion:

the SPIRIT approach works most effectively when Games, Learning Activities and STEAM are not treated as activities to be delivered, but as deliberately designed learning environments for transversal competence development.

This distinction should guide the finalisation of all project outputs.

The pilot also confirms that the three Toolboxes have different implementation profiles and should retain these differences rather than being forced into an artificially uniform format.

- **Games** provide accessible, motivating and comparatively low-preparation entry points into competence development.
- **Learning Activities** provide particularly strong opportunities to embed transversal competences within everyday curricular learning.
- **STEAM activities** create complex, interdisciplinary and highly engaging learning environments with strong competence-development potential, but require more preparation, more flexible timing and more sophisticated teacher facilitation.

The validation therefore does not point towards the creation of one standardised pedagogical method. It supports a **common competence-oriented framework with multiple implementation pathways**.

A concise representation of the validated SPIRIT pedagogical logic is:

clear competence intention → meaningful challenge → active learner experience → appropriate teacher facilitation → reflection → recognition of learning → transfer to other contexts

This sequence represents a stronger common denominator for the project than any particular game, classroom technique or STEAM format.

4.2. Recommendations for the finalisation of the SPIRIT Toolboxes

4.2.1. Make the competence-development intention explicit

The most important recommendation for finalisation is to ensure that every Toolbox element communicates clearly **why the activity develops the identified SPIRIT competence**, rather than simply listing competences alongside an activity.

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The Cyprus Validation Meeting explicitly raised this issue. Participants questioned whether competences should merely appear in a matrix next to STEAM activities or whether the connection between a specific activity and a specific competence should be made pedagogically explicit. The teacher recommendations subsequently emphasised clear goals, intentionality and the need to know what the objective is and what questions should be asked of pupils.

The final templates should therefore distinguish at least three levels:

- **Primary competence** – the main transversal skill deliberately targeted.
- **Supporting competences** – other SPIRIT skills that may also emerge through the activity.
- **Development mechanism** – a brief explanation of what pupils actually do that creates an opportunity to develop the primary competence.

For example, stating that an activity develops *Flexibility* is less useful than explaining that pupils are required to revise an initial strategy after receiving new information, compare alternative approaches and reflect on why changing strategy was necessary.

This would substantially strengthen the methodological consistency of the Toolbox while preserving diversity in activity design.

4.2.2. Embed reflection into the activity template itself

Reflection should not appear as an optional sentence at the end of an activity description.

The pilot consistently demonstrated that the learning experience becomes considerably more powerful when teachers help pupils interpret what has happened. The Cyprus validation recommendations explicitly called for sufficient time for reflection and follow-up work and cautioned against stopping at a “WOW” moment rather than moving towards an “AHA” moment.
Each final Toolbox description should therefore include a clearly identifiable **Reflection and Transfer** section.

This should preferably contain a small number of age-appropriate prompts organised around three stages:

Experience

- What happened?
- What was easy or difficult?
- What did you notice?

Competence reflection

- What helped you solve the problem?
- What did you do when your first idea did not work?
- How did your group make a decision?
- How did another person feel?

Transfer

- Where else could this happen?
- When might you need the same skill again?
- What could you do differently next time?

This would turn reflection from an assumed professional practice into an explicit component of the SPIRIT methodology.

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4.2.3. Distinguish the pedagogical core from adaptable elements

The pilot provides strong evidence that **adaptation is one of the strengths of the resources**.

Teachers successfully changed materials, duration, group size, vocabulary, physical setting, task complexity and subject context. These modifications often improved accessibility without undermining the competence-development intention.

The final Toolboxes should therefore avoid giving the impression that successful implementation requires literal reproduction.

Each activity could identify:

Keep this – the essential pedagogical mechanism that should remain intact.

You can adapt this – materials, duration, group size, subject context, physical environment, narrative framing or level of complexity.

This would operationalise the principle of **adaptive fidelity**.

Such guidance is particularly important for European transferability. An activity that works in Belgium, Cyprus, Hungary, Italy or Romania should not depend on identical timetables, classroom arrangements, materials or curricular terminology in order to remain recognisably SPIRIT.

4.2.4. Provide clearer age-specific scaffolding

High age-appropriateness ratings across the pilot should not obscure the fact that successful implementation frequently depended on teacher adaptation.

The final resources should therefore provide more guidance than a broad age indication alone.

Where relevant, activities should include brief adaptations such as:

- **for younger learners**;
- **for older or more experienced learners**;
- **for mixed-age groups**;
- **if language demands are high**;
- **if pupils require additional scaffolding**.

These need not become extensive differentiated lesson plans. Often one or two practical suggestions are sufficient: use a smaller playing field, reduce the number of rules, introduce visual instructions, model one example, use physical markers, provide predefined roles or divide a complex challenge into stages.

This approach would improve both **inclusion and usability**.

4.2.5. Make timing realistic and modular

Time emerged as the most consistent practical constraint, especially in STEAM.

The final resources should therefore avoid presenting duration as an overly precise promise. Instead, activities should distinguish between:

- **minimum core time;**
- **recommended implementation time;**
- **reflection time;**
- **optional extension;**
- **possibility of implementation across several lessons.**

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The Paphos recommendations explicitly recognised that activities may be divided over time, that the timeframe should remain flexible and that both preparation and follow-up require sufficient space.

A modular format would allow teachers to distinguish between the pedagogical core and enrichment elements without sacrificing learning quality.

For STEAM in particular, the preferred approach should often be:

explore → pause → reflect → continue → produce → revisit

rather than forcing all stages into one continuous session.

4.2.6. Strengthen learner agency without removing necessary structure

The STEAM analysis showed exceptionally strong ratings for learning by doing, experimentation, interest-driven learning and safe failure, while **placing pupils in the "driver's seat" was the relatively weakest dimension**.

This should become a targeted refinement area.

Final STEAM descriptions should identify opportunities where pupils can make genuine decisions, for example:

- selecting materials;
- choosing between solution pathways;
- formulating a hypothesis;
- assigning group roles;
- designing part of the investigation;
- choosing how to present the result;
- deciding how to test or improve a prototype.

For the 6–10 age group, this does not imply completely open-ended learning. Effective learner agency often requires **bounded choice within a carefully designed structure**.

The objective is therefore not:

less teacher involvement

but:

more meaningful pupil decision-making.

4.2.7. Preserve the full meaning of STEAM

The Cyprus validation strongly emphasised that the "A" in STEAM has a substantive pedagogical role and should contribute to divergent thinking, creativity and intrinsic motivation. Participants also concluded that links between subjects are essential and that the research component of activities could be strengthened. The final Toolbox should therefore avoid two common simplifications.

First, STEAM should not become a collection of visually attractive craft activities with only a weak connection to inquiry, science or problem-solving.

Second, Art should not become decoration added to an otherwise conventional STEM task.

Strong SPIRIT STEAM activities should seek a meaningful interaction between:

- research
- experimentation
- disciplinary knowledge
- creativity

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- construction or expression
- reflection

Where possible, the description should make the interdisciplinary connection explicit rather than merely listing participating subjects.

4.2.8. Keep material requirements realistic

Scalability requires affordability.

The teacher recommendations from Paphos explicitly included keeping budgets low and making use of nature and outdoor spaces.

Final activities should therefore prioritise:

- ordinary classroom materials;
- reusable resources;
- recycled materials;
- natural materials;
- easily substituted components;
- free or already available digital resources where digital tools are needed.

Where specialist equipment is used, an accessible alternative should be suggested whenever pedagogically possible.

This is not only a practical consideration. It directly supports **equity of access and European transferability**, particularly across schools operating under very different resource conditions.

4.3. Recommendations for pedagogical implementation

4.3.1. Start from the competence, not from the activity

A central lesson from the validation process is that a good activity should not be selected merely because it appears enjoyable or innovative.

The teacher should first ask:

What do I want pupils to practise or become more aware of?

Only then:

Which SPIRIT activity creates a meaningful situation in which that competence becomes necessary?

This reverses a common implementation pattern.

Instead of:

interesting activity → attach several competences

SPIRIT should encourage:

identified learning need → intended competence → suitable learning experience → reflection

This is the essence of **intentional skills development**.

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4.3.2. Treat competence development and curricular learning as one intervention

The Paphos framework discussion reached an important conclusion: pedagogical goals and transversal competence goals should not be treated as two separate interventions; they should form a **combined pedagogical intervention**. The same discussion stressed meaningful connections between subjects and clear links with real-life contexts.

This is critical for the long-term uptake of SPIRIT.

Transversal competence development is unlikely to become sustainable if it is perceived as an additional programme competing for already limited curriculum time.

Instead of asking:

“When can I find time to teach resilience?”

teachers should increasingly be supported to ask:

“Where in my existing mathematics, language, science, arts or environmental learning can pupils experience a situation that requires resilience?”

The Toolboxes should therefore be positioned as **curriculum-enriching resources**, not as an additional curriculum.

4.3.3. Use the “WOW”, but design for the “AHA”

The pilot confirms the motivational power of novelty, play, experimentation, movement and discovery.

These elements should be retained.

However, high emotional engagement can occasionally obscure the intended learning. The implementation principle should therefore be:

create engagement deliberately – but conclude with meaning deliberately.

The “WOW → AHA” formulation emerging from the validation meeting provides a particularly accessible implementation message for teachers.

WOW brings pupils into the learning situation.

AHA helps them understand what they discovered, how they behaved, what changed and what they can take into another context.

A successful SPIRIT activity should ideally contain both.

4.3.4. Design collaboration, do not merely create groups

The pilot showed that collaboration is simultaneously one of the strongest learning mechanisms and one of the areas where implementation can become unequal.

Teachers should therefore plan the **participation architecture** of group activities.

This can include:

- meaningful roles;
- rotation of responsibility;
- explicit turn-taking;
- clear rules for use of shared materials;
- buddy arrangements;

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- small-group rather than whole-class challenges;
- opportunities for quieter pupils to contribute;
- deliberate reflection on group processes.

Conflict and unsuccessful collaboration should not necessarily be removed from the activity. When appropriately managed, they provide authentic material for developing Empathy, Connectedness, Emotional Awareness, Flexibility and Problem-Solving.

4.3.5. Preserve productive difficulty and safe failure

The validation results strongly support learning environments in which pupils can experiment without the first unsuccessful attempt being interpreted as failure in a summative sense.

The pedagogical sequence should often be:

try → observe → fail or partially succeed → reconsider → adapt → try again → discuss

This mechanism directly supports several SPIRIT skills.

For teachers, however, the challenge is to distinguish **productive struggle from unproductive frustration**. This requires active observation and carefully timed scaffolding.

The appropriate teacher intervention is often not to provide the answer, but to provide the next question.

4.3.6. Use learning environments beyond the conventional classroom

Outdoor learning, movement, natural materials, physical construction and authentic environments repeatedly strengthened implementation across the national pilots.

Where appropriate, SPIRIT resources should encourage learning in:

- school grounds;
- corridors and shared spaces;
- parks and natural environments;
- libraries;
- museums or community environments;
- other flexible school spaces.

This does not mean that competence-oriented education requires special architecture. It does mean that **the learning environment can function as a pedagogical resource**.

4.4. Teachers are the main scaling mechanism

The pilot demonstrated that the quality of SPIRIT implementation depends less on strict procedural fidelity than on **teacher professional judgement**.

Teachers translated activities into local curricula, adjusted complexity, interpreted pupil reactions, introduced scaffolding and added reflection.

This has an important consequence for exploitation:

the Toolbox alone cannot carry the full innovation.

The project's teacher-training and Community of Practice components are therefore not secondary dissemination outputs. They are essential elements of the implementation model.

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Professional learning should particularly strengthen teachers' ability to:

- identify transversal competence objectives;
- formulate reflective questions;
- design active learning situations;
- differentiate without losing the competence focus;
- facilitate collaborative learning;
- manage productive failure;
- integrate STEAM across subjects;
- support learner agency;
- evaluate pupil processes rather than only final products.

The Paphos meeting itself provides evidence for the value of this practitioner-to-practitioner approach. Participants repeatedly identified the presence of pilot teachers, first-hand classroom experience, practical demonstrations and knowledge sharing as major strengths of the validation meeting. They simultaneously requested more time for reflection and clearer shared terminology. This supports a capacity-building model based on:

resource → classroom experimentation → professional reflection → peer exchange → refinement

rather than:

resource → one-off training → independent implementation.

4.5. Recommendations for local uptake and whole-school implementation

At local level, the primary challenge following project completion will be moving from individual enthusiastic teachers towards more sustainable institutional use.

A realistic uptake pathway can be organised in four stages.

Stage 1 – Entry

Teachers begin with a small number of Games or Learning Activities requiring limited preparation.

The objective is to experience competence-oriented pedagogy without substantial organisational change.

Stage 2 – Intentional integration

Teachers begin connecting SPIRIT activities explicitly to curricular objectives and using structured reflection.

The language of the ten skills gradually becomes part of professional lesson planning.

Stage 3 – Collaborative implementation

Teachers exchange adapted versions, jointly plan STEAM activities, use co-teaching where appropriate and discuss implementation in professional learning communities.

The school begins building its own local **SPIRIT idea bank**.

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Stage 4 – Institutional embedding

Competence development becomes visible in school-level planning, professional development and learning-design discussions.

SPIRIT resources can contribute to thematic weeks, interdisciplinary projects, transition programmes, well-being initiatives or school development priorities.

This gradual progression is consistent with the Paphos recommendation not to move immediately from "0% to 100%", but to **start small, learn through implementation and improve iteratively**.

For school leaders, the principal enabling conditions are therefore:

- protected time for collaborative planning;
- permission to adapt materials;
- professional trust;
- opportunities for peer observation and exchange;
- access to suitable spaces and basic resources;
- recognition that meaningful active learning may require flexible lesson organisation.

4.6. The European horizon: relevance beyond the partnership

The evidence generated through SPIRIT should also be interpreted against the evolving European education and skills agenda.

This wider policy context does not form part of the SPIRIT pilot evidence itself; rather, it provides a **European policy horizon for interpreting the potential transfer and exploitation of the validated results**.

4.6.1. SPIRIT and the Union of Skills

Since 2025, the **Union of Skills** has placed skills development at the centre of the European Commission's strategic agenda. The initiative links stronger education and training with European competitiveness, innovation, social cohesion and the capacity of citizens to thrive in a rapidly changing environment.

SPIRIT contributes to this agenda from an important upstream position.

Its target group is not entering the labour market and should not be approached through a narrow employability framework. Nevertheless, the competences developed in primary education – curiosity, resilience, problem-solving, flexibility, creativity, critical thinking, collaboration and emotional regulation – form part of the developmental foundations on which later learning, skills acquisition and adaptability depend.

The European relevance of SPIRIT therefore lies partly in connecting the current skills agenda with a **long-term developmental perspective beginning in primary education**.

4.6.2. Basic skills and transversal competences should reinforce each other

The Commission's 2025 **Action Plan on Basic Skills** seeks to strengthen literacy, mathematics, science, digital and citizenship skills from early years through school education. It places particular emphasis on improving teaching and learning, supporting educators, creating supportive environments and strengthening the exchange of effective practices.

SPIRIT should be positioned as complementary to this agenda, not as an alternative to basic skills.

The validation findings demonstrate why this distinction matters.

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- Curiosity supports inquiry.
- Resilience supports persistence.
- Critical Thinking supports interpretation.
- Problem-Solving supports the application of knowledge.
- Emotional regulation supports sustained participation.
- Collaboration supports learning with others.

In this sense, transversal competences can be understood as **enabling conditions for successful learning**, while strong subject knowledge provides the content through which these competences can be practised meaningfully.

4.6.3. SPIRIT and the European STEM agenda

The Commission's **STEM Education Strategic Plan**, adopted in 2025 as part of the Union of Skills, seeks to strengthen STEM education across Europe, address declining performance, improve participation and support stronger and more inclusive talent pipelines. It also highlights the need for effective teaching, cooperation, evidence-informed practice and dissemination of successful approaches.

SPIRIT can contribute to this horizon in several ways.

First, it begins with younger pupils and therefore supports the formation of **curiosity, confidence and positive attitudes towards inquiry** before later educational and career decisions emerge.

Second, its STEAM model connects science and problem-solving with creativity, experimentation and real-life contexts.

Third, the project explicitly connects disciplinary learning with transversal competences, supporting the kind of flexible thinking increasingly required in complex scientific and technological environments.

Fourth, its emphasis on adaptability and low-cost implementation creates potential for broader uptake beyond specialist STEM schools or highly resourced environments.

The European Commission's own recent work on STEM education has also emphasised the importance of clearly defining intended outcomes, assessing the effectiveness and feasibility of educational practices and strengthening teacher and school capacity. These concerns are closely aligned with the purpose of the SPIRIT pilot and validation process.

SPIRIT therefore offers an example of how European STEM ambitions can be supported at primary level through **experience-rich, competence-oriented and teacher-adaptable learning design**.

4.6.4. European transfer should be based on principles, not replication

One of the strongest lessons from the five-country pilot is directly relevant to European cooperation.

Transferability does not mean uniformity.

The same competence-development logic was implemented through different subjects, cultural references, school structures, physical environments and teacher adaptations.

A European scaling model should therefore avoid producing an overly rigid "European lesson format".

The transferable unit should instead be the **pedagogical principle**:

- intentional competence focus;
- age-appropriate challenge;
- active participation;
- inclusive collaboration;
- meaningful real-life connection;

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- reflection;
- transfer.

The concrete form should remain adaptable.

This makes the SPIRIT approach particularly appropriate for the European Education Area, whose cooperation model brings together national education systems while recognising that responsibility for the organisation and content of education remains largely with Member States. The wider European Education Area aims to strengthen quality, inclusion and resilience through cooperation and mutual learning rather than curricular homogenisation.

4.7. SPIRIT, Mental health and social-emotional learning (SEL) in the European context

The relevance of SPIRIT extends beyond the European skills and STEM agendas. A substantial part of the SPIRIT Framework is also closely connected to the increasingly prominent European policy discussion on **children's mental health, well-being, supportive learning environments and social-emotional learning (SEL)**. This connection should nevertheless be articulated carefully. SPIRIT is not a mental-health intervention, therapeutic programme or diagnostic instrument. Its contribution lies primarily on the **universal, preventive and competence-development side of the continuum**: it creates structured educational opportunities through which children can learn to recognise and regulate emotions, establish supportive relationships, cope with difficulty, adapt to change, communicate constructively and develop a stronger sense of connection with other people and their environment.

This positioning is particularly relevant in light of the European Commission's **comprehensive approach to mental health**, launched in 2023. The EU approach places mental health alongside physical health as a major public-policy concern and is structured around three guiding principles: effective prevention, access to high-quality and affordable mental healthcare and treatment, and reintegration into society following recovery. It includes 20 flagship initiatives supported by approximately EUR 1.23 billion from different EU financial instruments and gives specific attention to the mental health of children and young people. For SPIRIT, the preventive dimension is particularly significant. Educational institutions cannot and should not take over the responsibilities of clinical mental-health services, but schools can contribute to the development of protective personal and social capacities before difficulties escalate to the level at which specialised intervention becomes necessary. The European policy trajectory increasingly recognises precisely this distinction: mental health is not only a matter of treatment after problems emerge, but also of creating developmental environments in which children acquire the competences, relationships and coping resources that help them deal with ordinary stress, uncertainty, interpersonal difficulty, change and failure.

Within the **European Education Area**, pupil and teacher well-being has similarly become an explicit dimension of educational quality. The European Commission's understanding of well-being at school extends far beyond the absence of mental-health problems. It includes meaningful engagement in academic and social life, a positive sense of identity, the capacity to manage thoughts and emotions, self-esteem and autonomy, supportive relationships, safety, respect and a sense of belonging to the classroom and school community. The development of **social and emotional competences** is explicitly identified as one of the educational strategies through which schools can promote mental health and well-being. This creates a particularly strong conceptual bridge to SPIRIT, since several of the ten SPIRIT skills correspond directly to capacities that European educational policy increasingly regards as components and enablers of well-being.

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Emotional Awareness, Regulation and Communication, for example, supports children in recognising internal emotional states, managing emotional reactions and communicating feelings constructively. **Empathy** develops the capacity to understand the emotions, experiences and perspectives of others, while **Connectedness** relates directly to belonging, supportive relationships and the experience of being part of a community. **Resilience** concerns the ability to cope with difficulty and recover from setbacks, while **Flexibility** supports adaptation when circumstances, strategies or expectations need to change. At the same time, **Problem-Solving and Critical Thinking** provide cognitive resources for dealing with uncertainty rather than responding to difficulty solely through avoidance or emotional reactivity. **Valuing People and Nature** extends the perspective beyond the individual by embedding well-being in relationships, community and the wider living environment. The relationship between SPIRIT and the European mental-health agenda is therefore not the result of retrospectively attaching a well-being label to a future-skills project. It is embedded in the structure of the SPIRIT Framework itself.

SPIRIT and the European social-emotional learning agenda

The connection becomes even clearer when SPIRIT is considered alongside **LifeComp – the European Framework for the Personal, Social and Learning to Learn Key Competence**, developed by the European Commission's Joint Research Centre. LifeComp was designed as a non-prescriptive conceptual framework that can support curriculum development and the design of learning activities. It addresses capacities such as self-regulation, managing complexity, relating constructively to others, developing meaningful goals and becoming a reflective lifelong learner. SPIRIT does not reproduce LifeComp, and the two frameworks should not be presented as equivalent, but they share an important pedagogical assumption: **personal and social competences are learnable and can therefore be intentionally developed through education**.

This is an important point because social-emotional development is still sometimes treated within schools as something that simply happens through maturation or everyday classroom interaction. Both LifeComp and SPIRIT challenge this assumption by treating relationships, self-regulation, empathy, resilience and communication as areas that can be supported through deliberately designed learning experiences. SPIRIT adds a particularly practice-oriented layer to this European discussion by asking what these competences actually look like in six-, seven-, eight- or ten-year-old children and what a teacher can do in an ordinary lesson to create a situation in which pupils can practise them. The final SPIRIT Toolbooks translate this logic into concrete pedagogical resources through Games, Learning Activities and age-specific STEAM programmes organised around the ten SPIRIT skills.

There is no single harmonised European SEL curriculum, nor would such uniformity correspond to the division of responsibilities between the European Union and its Member States in education. Nevertheless, **social and emotional learning is increasingly visible across European policy frameworks concerned with key competences, well-being, inclusion and school success**. The European Commission has developed school-oriented resources addressing social and emotional learning, resilience, mental-health promotion, bullying prevention and teacher well-being, and these are embedded within a broader **whole-system and whole-school approach**. This approach combines universal measures available to all learners with targeted support for pupils who may be at risk of, or already experiencing, mental-health difficulties.

The 2022 Council Recommendation on **Pathways to School Success** strengthens this connection by treating well-being as an integral dimension of educational success and by promoting integrated approaches that combine preventive, intervention and compensatory measures. Within such a framework, SPIRIT is most appropriately positioned at the **universal preventive level**. Its purpose is to offer all children repeated opportunities, within ordinary educational practice, to develop personal and social competences and to broaden their repertoire for managing everyday developmental, interpersonal and learning-related challenges. Some pupils will require additional educational, psychological or social support, and a smaller

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group may need specialist mental-health services. SPIRIT does not replace these layers; rather, it can form part of the universal educational environment within which early needs may also become more visible.

The European Commission's 2024 guidelines on **well-being and mental health at school**, developed under the Pathways to School Success initiative, provide an especially relevant reference point. The guidelines advocate a whole-system and whole-school approach and emphasise prevention through competence development and social-emotional learning, stronger educator capacity, meaningful learner participation and cooperation between schools, families and actors from other sectors. These principles have clear counterparts in the SPIRIT model. Preventive social-emotional competence development is embedded directly in the ten skills; educator capacity-building is addressed through the project's teacher-training and Communities of Practice; learner participation corresponds to the active-learning approach and the validation recommendation to strengthen learner agency; and collaboration, relationships and reflection recur across all three Toolbooks.

In this respect, SPIRIT provides a practical chain between European policy and classroom practice. A broad European objective such as promoting emotional self-regulation can become a classroom activity in which pupils recognise frustration, identify what triggered it and discuss how they responded. A policy focus on belonging can be translated into cooperative learning situations in which children experience shared responsibility and learn to include different voices. A commitment to resilience can become a construction or problem-solving task in which the first solution fails and pupils are required to adapt their strategy rather than abandon the task. The value of SPIRIT lies partly in making these broad policy objectives **pedagogically observable and practicable in primary education**.

From abstract SEL concepts to concrete SPIRIT learning experiences

The SPIRIT resources contain numerous examples of this translation from abstract social-emotional competence to concrete classroom experience. The **Kindness Tree**, for instance, creates a visible collective representation of supportive actions within the class. Although Resilience is a central competence, the activity also connects Emotional Awareness, Empathy, Connectedness and Valuing People and Nature. Children record acts of kindness on leaves, flowers or fruits that gradually form a shared classroom tree, after which they reflect on what these actions meant for others and what feelings they generated. The educational mechanism therefore goes beyond encouraging "nice behaviour": individual prosocial action becomes visible within a shared class identity and is then interpreted through reflection on relationships and emotional consequences.

The adapted **Falling Night in Palermo – Buddy Village Edition** provides another useful example. Rather than removing competition altogether, it reframes the game so that pupils also work towards a form of community success based on respect, inclusion of different voices, management of emotions and repair of relationships after mistakes. This is significant from a social-emotional learning perspective because emotionally supportive classrooms are not environments in which disagreement, disappointment or conflict never occur. A more realistic educational objective is to create bounded situations in which children can learn how to deal with such experiences without damaging relationships or excluding others.

A more complex example is the STEAM programme **Lemonade Stories: From Family Tradition to School Community**, which integrates science, literacy, sustainability and social-emotional learning. Pupils connect tastes to memories and emotions, listen to different family traditions, practise respectful language when preferences differ, make collaborative decisions and eventually provide something for the wider school community. Emotional awareness, empathy and connectedness are therefore developed alongside measurement, scientific inquiry and communication. This is particularly relevant to the European discussion on SEL because it demonstrates that social-emotional competence does not need to be taught as a separate addition to academic learning. A science or interdisciplinary activity can simultaneously require children to negotiate preferences, recognise emotional reactions, communicate disagreement respectfully and respond to the needs of an audience.

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The **Activating the Senses** STEAM activity illustrates a similar principle. Pupils explore a meadow or park through sensory observation and compare how different people may experience the same environment. Empathy, Connectedness, Emotional Awareness, Resilience and Valuing People and Nature become meaningful because children discover through direct experience that the same physical environment can be perceived differently by another person. For younger learners in particular, this concrete route into social-emotional learning is developmentally appropriate: experience precedes abstraction, and the teacher subsequently helps pupils to interpret what that experience reveals about themselves and others.

The SPIRIT pilot results support these mechanisms, while also defining the limits of what can be claimed. Across Games and Learning Activities, teachers rated perceived competence development at **4.70/5**, while STEAM activities achieved **4.76/5**. Within the STEAM-specific pedagogical characteristics, creating a safe environment for failure received **4.61/5**, opportunities to learn from mistakes **4.50/5**, and collaboration and open communication **4.53/5**. These results are relevant to the mental-health and SEL discussion because they suggest that the resources can create educational environments in which children experience challenge, interaction, failure, adaptation and communication in a structured way. They do not, however, demonstrate reductions in anxiety, depression, psychological distress or the incidence of mental-health disorders, because the pilot did not measure clinical outcomes and was not designed as a clinical or longitudinal intervention study. The appropriate conclusion is therefore that **SPIRIT provides positively validated educational environments for practising several personal and social competences associated in European frameworks with well-being, resilience, supportive relationships and social-emotional development**.

Resilience, safe failure and supportive relationships

The mental-health connection also requires a careful interpretation of **Resilience**. In educational discourse there is a risk that resilience is reduced to the idea that children should simply learn to endure difficult circumstances. Such an interpretation would be inconsistent with the more systemic European understanding of well-being. The European whole-school approach recognises that children's well-being is shaped by relationships, school climate, family, community and wider socioeconomic conditions. Schools cannot solve structural or psychological difficulties merely by asking individual children to become more resilient.

SPIRIT is most consistent with this European perspective when Resilience is understood relationally and in combination with other competences. Resilience is strengthened through **Connectedness** when children know that support is available; through **Emotional Regulation** when they can recognise and manage their responses to difficulty; through **Flexibility**when they can change an ineffective strategy; through **Problem-Solving** when they can identify possible actions rather than experience themselves as powerless; and through **Empathy** when personal coping remains connected to awareness of the needs of others. This is a more educationally responsible model of resilience than the simplistic expectation that children should become individually "tougher".

One particularly valuable point of connection between the SPIRIT pilot and the European well-being agenda concerns **safe failure**. The STEAM pilots gave one of their strongest ratings, 4.61/5, to the creation of an environment in which failure could be addressed safely. This finding is relevant not only to Creativity or Problem-Solving but also to social-emotional development. A psychologically safer learning environment allows children to discover that making a mistake does not automatically threaten their standing in the group, asking for help is acceptable, another pupil may have a better idea, frustration can be tolerated, an unsuccessful attempt can be discussed rather than hidden, and changing one's mind is legitimate. The learning process can therefore contain challenge, emotional reaction, regulation, social support, revised action and reflection within the same pedagogical sequence.

Connectedness is equally important. European well-being policy places considerable emphasis on a learner's sense of belonging, safety and being valued within the school community. SPIRIT's decision to

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include **Connectedness as a distinct competence** is therefore particularly relevant. It can be developed through everyday classroom mechanisms such as shared goals, listening, cooperation, buddy structures and collective responsibility, but it can also expand beyond the classroom. Activities such as Lemonade Stories move progressively from personal and family experiences towards group cooperation and contribution to the school community. Such a progression illustrates how social-emotional learning can support not only individual well-being but also participation, community-building and the wider European goals of inclusion and active citizenship.

Learner agency, teacher capacity and whole-school implementation

The European well-being agenda also places increasing emphasis on pupil voice and meaningful participation. This connects directly with one of the more useful critical findings of the SPIRIT validation: within the STEAM pilot, the item describing children as being in the "driver's seat" received an average of **3.96/5**. This is positive in absolute terms, but lower than ratings for learning by doing, experimentation, interest-driven learning or collaboration. From a well-being perspective, the distinction matters because agency and autonomy contribute to a child's experience of being able to influence their environment rather than merely respond to externally imposed demands.

SPIRIT can strengthen this dimension by providing age-appropriate opportunities for genuine choice, for example by allowing pupils to select materials, decide roles, choose between possible solution paths, formulate hypotheses or determine how their group will present an outcome. For younger learners, however, this should not imply unrestricted openness. The more appropriate principle is **bounded agency**, in which safe structure and meaningful choice are combined. Such an approach protects clarity and emotional security while still increasing pupil ownership.

The same European policy perspective provides a reason not to restrict SPIRIT to isolated classroom activities. A whole-school approach to well-being recognises schools, families and communities as parts of an interconnected ecosystem and encourages cooperation with municipalities, welfare and health services, youth organisations and higher education institutions. SPIRIT can contribute to this ecosystem while maintaining a clear educational role. At classroom level, teachers can use the Games, Learning Activities and STEAM programmes; at professional level, the ten skills can provide a shared language for discussing learner needs and pedagogical responses; at school level, they can inform conversations about classroom climate, inclusion, transition, participation and school development; and at community level, selected activities can connect pupils with families, nature and local stakeholders. Where specialised support is required, however, SPIRIT should remain complementary to school psychology, counselling, child protection, social care and healthcare services rather than attempting to substitute for them.

Teacher capacity is another essential element of this picture. Social-emotional learning may appear intuitively accessible, but facilitating discussions about frustration, conflict, empathy or emotion requires professional confidence and judgement. Highly active collaborative learning also creates organisational and emotional demands for teachers. The SPIRIT pilot identified this clearly, particularly in STEAM, where preparation demands were significantly higher than for Games and Learning Activities. European policy increasingly treats teacher well-being and teacher professional capacity as part of the same system as pupil well-being. Consequently, sustainable SPIRIT implementation should not create an unintended expectation that teachers are individually responsible for solving pupils' mental-health difficulties through better pedagogy. Instead, implementation should combine clear guidance, professional development, peer learning, realistic workload expectations, supportive school leadership and clear boundaries for referral to specialised support.

The SPIRIT in-service training programme and Communities of Practice are therefore highly relevant to its potential contribution to the European SEL and mental-health agenda. They can create professional spaces in which teachers develop a shared understanding of the ten competences, exchange experiences, analyse

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challenging situations and refine their facilitation practices rather than having to interpret complex social-emotional situations in isolation.

European-level conclusion

SPIRIT is well positioned within the emerging European convergence between **skills policy, educational quality, well-being, social-emotional learning and preventive mental-health promotion**. The European Commission's comprehensive approach to mental health gives increasing priority to prevention and to children and young people; the European Education Area treats well-being and mental health as important dimensions of school quality; the Pathways to School Success initiative embeds well-being within the concept of educational success; and LifeComp provides a European competence language for personal, social and self-regulatory development.

SPIRIT operates at the intersection of these agendas, but its contribution remains distinctly **educational, developmental and preventive rather than clinical or therapeutic**. It offers children repeated opportunities to encounter manageable challenges, identify emotions, practise regulation, understand different perspectives, cooperate with others, experience belonging, recover from unsuccessful attempts and reflect on their own behaviour. It also offers teachers concrete ways of integrating these processes into ordinary learning rather than treating well-being as an occasional additional programme disconnected from curriculum and pedagogy.

This is an important contribution from a European perspective. Mental-health promotion and social-emotional learning need not begin only when problems become visible, nor should they be separated entirely from everyday teaching. They can be embedded much earlier in the ordinary culture of learning through relationships, games, inquiry, reflection, creativity, failure, cooperation and meaningful participation. SPIRIT therefore contributes to a European educational horizon in which preparing children for the future means not only ensuring that they acquire knowledge and academic skills, but also enabling them to **understand themselves, relate constructively to others, manage difficulty, remain curious, participate meaningfully and recognise when support is needed**.

4.8. European added value: from resources to a shared professional language

The most important European outcome of SPIRIT may ultimately extend beyond the individual Toolbox elements.

The project creates a shared language through which teachers in different countries can discuss questions such as:

- What does Resilience look like in a seven-year-old?
- How can Flexibility be observed during a mathematics activity?
- How can a game create opportunities for Empathy?
- When does active participation become genuine learner agency?
- How can a STEAM task combine disciplinary learning with transversal competence development?
- How can teachers recognise the difference between engagement and learning?

These questions are inherently transnational.

The national pilots showed that the concrete answers may differ, but the professional discussion itself remains meaningful across systems.

This creates potential for the Toolboxes to function not only as **Open Educational Resources**, but also as **boundary objects for European professional learning**: shared resources around which teachers from different contexts can compare, adapt and refine practice.

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The project's Local and International Communities of Practice are therefore an important mechanism for sustaining European added value after the development phase.

Their purpose should not be simply to disseminate finished project products. They can become spaces for continuing:

implementation → evidence sharing → adaptation → mutual learning → new implementation

This is particularly consistent with current European emphasis on stronger knowledge exchange, educator support and dissemination of effective educational practice.

4.9. Recommendations for sustainability and future exploitation

To maximise the value of the validated outputs after the formal project period, the following priorities are recommended.

1. Maintain open and accessible resources

The final Toolboxes should remain easily accessible as Open Educational Resources and should avoid technical formats that create unnecessary barriers for ordinary teachers.

2. Preserve multilingual access

National-language versions are essential for meaningful uptake in primary education. Cross-European visibility should be supported through a consistent English reference version while preserving local adaptations.

The project management process already envisaged national consolidation, cross-translation and quality checking of the English collections before finalisation.

3. Treat adaptations as new professional knowledge

Teachers should be encouraged to document successful variants rather than regarding them as unofficial deviations.

Over time, a SPIRIT repository could therefore evolve from a static Toolbox into a curated **implementation knowledge base**.

4. Connect resources with professional learning

Every dissemination strategy should provide a pathway from "finding an activity" to "understanding how competence-oriented pedagogy works".

5. Continue Communities of Practice

Peer learning appears to be particularly valuable for pedagogical approaches in which implementation quality depends on facilitation and adaptation.

6. Collect implementation evidence beyond the project

Future users could be encouraged to provide short structured feedback on adaptations, age groups and implementation conditions. This would allow the evidence base to develop organically without requiring another formal research project.

7. Preserve the distinction between evidence and promise

SPIRIT has produced strong practice-based validation evidence. Future communication should use this confidently, but should not overstate it as experimental proof of measurable competence gains.

This methodological precision strengthens rather than weakens the credibility of the project.

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5. Final conclusion

The SPIRIT validation process began with a practical question: whether the project's Games, Learning Activities and STEAM resources could function as meaningful tools for developing transversal skills among children aged 6–10.

The evidence provides a positive answer, but also a more sophisticated one.

The Toolboxes are effective not because they prescribe one ideal method, and not simply because pupils enjoy them. Their value lies in their capacity to create **meaningful situations in which transversal competences become necessary, observable and discussable**.

The validation process also makes clear that the real innovation resides in the relationship between four elements:

- the learner
- the learning experience
- the intended competence
- the teacher's pedagogical judgement.

The activity connects these elements, but it cannot replace any of them.

For finalisation, SPIRIT should therefore prioritise **clarity without rigidity, structure without over-prescription, engagement without superficiality, and flexibility without losing pedagogical intention**.

For implementation, the central message is equally clear:

start with a meaningful goal, create an experience, allow children to explore, help them reflect, and make the competence visible.

For Europe, the relevance of SPIRIT lies in demonstrating that future-oriented competence development can begin early, remain closely connected to curricular learning and be implemented across different educational systems without requiring pedagogical uniformity.

At a time when European policy increasingly emphasises skills, stronger basic learning, STEM capacity, educator support, inclusion, resilience and lifelong learning, SPIRIT offers a practical primary-school contribution to that agenda. The Commission's current policy framework places education and skills at the centre of Europe's capacity to respond to technological, economic and societal change, while emphasising that high-quality and inclusive education remains a foundation of both competitiveness and social progress.

The project's contribution is therefore not to predict precisely which occupations today's children will enter.

It is to help schools develop some of the human capabilities that will allow them to **learn, adapt, cooperate, question, create, recover from difficulty and remain connected to other people and the world around them** – whatever that future eventually requires.

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