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Integrated Steam Activities in Early Childhood Education: Good Practice Examples from the “Traveler in Europe” Project

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Abstract. This paper presents the practical implementation of the “Traveler in Europe” thematic project, carried out between April and May 2026 with 25 preschool children aged three to six in a mixed-age group in Romania. The project connected intercultural exploration with an integrated STEAM approach, using selected European countries as meaningful contexts for learning. The descriptive analysis is based on teacher observation, photographic documentation, and the products created by the children during the activities. Five learning experiences inspired by Spain, Germany, Greece, Ireland, and Romania are discussed. Science, technology, engineering, arts, and mathematics were integrated naturally through play, sensory exploration, construction, storytelling, music and movement, simple experiments, and collaborative tasks. The observed manifestations included active participation, curiosity, cooperation, creative and verbal expression, spatial reasoning, hypothesis formulation, and practical problem-solving. As no standardized assessment was used, these manifestations are interpreted as pedagogical observations rather than evidence of causal effects. The project illustrates how cultural themes can provide accessible and engaging contexts for developmentally appropriate STEAM experiences in early childhood education.

Keywords: early childhood education, STEAM, integrated learning, intercultural education, play-based learning, good practice.

Introduction

Early childhood education supports children’s cognitive, social, emotional, physical, and creative development. At this stage, learning becomes meaningful when children participate actively and connect new knowledge with play, exploration, movement, communication, and direct interaction with materials. Developmentally appropriate practice emphasizes experiences based on play, exploration, and inquiry that respond to children’s individual, cultural, and linguistic characteristics [1]. Such experiences transform

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children from passive recipients of information into active participants who observe, ask questions, test ideas, make choices, and collaborate.

The STEAM approach integrates science, technology, engineering, arts, and mathematics within meaningful learning contexts. In early childhood education, these areas should not be treated as separate subjects or as a rigid collection of technical activities. They can be connected through construction, sensory exploration, simple experiments, storytelling, music, movement, classification, counting, and spatial orientation. Research emphasizes that STEAM integration should be adapted to the characteristics of young learners and organized around experiences that allow children to explore a common topic from several perspectives [2].

The five STEAM components do not need to be equally visible in every activity. Some experiences may focus on engineering and mathematics, while others emphasize scientific observation, artistic expression, or the use of tools and educational resources. Technology is not limited to digital devices; at preschool level, it can include age-appropriate tools, audio and visual resources, construction materials, and educational games. Engineering can be introduced through planning, assembling, testing, and improving constructions, while mathematics emerges through counting, comparing, classifying, recognizing patterns, and organizing objects in space. Inquiry, experimentation, construction, and practical problem-solving are frequently identified as valuable directions in early childhood STEM education [3].

Cultural exploration can provide a meaningful context for integrated STEAM learning. The UNESCO Framework for Culture and Arts Education highlights the importance of introducing culture and the arts from early childhood to promote creativity, intercultural understanding, and appreciation of diversity. It also recognizes the potential of STEAM approaches to connect artistic and cultural education with communication, innovation, and social-emotional development [4]. European music, stories, traditions, symbols, architecture, and natural phenomena can therefore become accessible starting points for interdisciplinary learning.

The “Traveler in Europe” thematic project was implemented between April and May 2026 with 25 children aged three to six from a mixed-age preschool group. Using imaginary travel as

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a common narrative framework, the project connected intercultural exploration with play, construction, sensory experiences, movement, storytelling, artistic expression, and simple scientific investigation. This paper presents five activities inspired by Spain, Germany, Greece, Ireland, and Romania. Its purpose is to illustrate how STEAM components can be integrated into developmentally appropriate preschool experiences and how cultural themes can support active, collaborative, and creative learning.

Project Design and Methodological Approach

The "Traveler in Europe" project was implemented between April and May 2026 at Jiblea Nouă Kindergarten with Standard Programme, Romania. The participants were 25 children aged three to six, enrolled in a mixed-age preschool group. The imaginary journey through Europe provided a common framework for cultural exploration and integrated STEAM learning.

The project aimed to familiarize children with European cultural diversity through practical, interactive, and developmentally appropriate experiences. The activities encouraged observation, questioning, simple hypothesis formulation, construction, experimentation, artistic expression, counting, classification, sequencing, spatial orientation, communication, and cooperation. They also promoted curiosity about other cultures and a sense of belonging to the European community.

The project followed a descriptive, practice-based approach and was not designed as an experimental study. It did not involve a control group, standardized tests, or quantitative measurements. The analysis was based on direct pedagogical observation, photographic documentation, children's verbal contributions, and the products created during individual and collaborative activities. Observation and documentation are consistent with developmentally appropriate practice because they help educators understand children's interests, strategies, learning processes, and forms of participation in authentic educational contexts [1].

During the activities, the teacher observed children's willingness to participate, curiosity, collaboration, persistence, practical problem-solving, spatial and logical organization, and verbal and artistic expression. These manifestations were used as descriptive indicators rather than standardized assessment criteria. Because the group included different ages and developmental levels, the

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complexity of the tasks, the materials, and the level of support were adapted to children's individual needs and pace.

Each country was introduced through accessible cultural elements such as music, stories, symbols, traditions, natural phenomena, or architecture. These elements became starting points for investigation, construction, movement, communication, and creation. Five activities were selected for this paper because they illustrate different forms of STEAM integration through music and rhythm, structural construction, sensory storytelling, scientific observation, spatial orientation, and European cultural identity.

Selected Examples of Integrated STEAM Activities

Spain: Rhythm, Movement, and Expressiveness

The activity inspired by Spain introduced the children to cultural elements through music, rhythm, and movement. They listened to musical examples, observed instruments, compared different sounds, and participated in rhythmic games and movement sequences. Scientific exploration emerged through attention to sound, vibration, and differences between instruments, while audio and visual resources supported the children's contact with Spanish music and culture. Mathematics was integrated through rhythm, repetition, succession, and temporal coordination. Music, dance, and expressive movement represented the artistic dimension of the activity. The children participated with enthusiasm, reproduced simple rhythmic patterns, coordinated their movements with musical sequences, and expressed themselves freely through dance and gesture.

Germany: Young Architects

During the activity dedicated to Germany, the children became "young architects" and used wooden blocks and plastic construction pieces to design towers and buildings. They selected materials, discussed possible solutions, assembled structures, and tested their stability. When a construction fell or became unbalanced, the children were encouraged to identify the possible cause and reorganize its base or arrangement. The activity connected scientific notions such as balance, gravity, stability, and cause-and-effect relationships with basic engineering processes: planning, construction, testing, and improvement. Mathematical learning included shape recognition, counting, comparison of dimensions, and spatial orientation. The children negotiated the use of materials, exchanged ideas, and collaborated in creating increasingly stable and complex structures.

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Greece: Legends and Treasures

The Greek theme was explored through a sensory and narrative learning space containing sand, shells, illustrated characters, and thematic objects. The children observed and compared the textures, shapes, and properties of natural materials. They then used illustrated dice containing characters, objects, and actions to create sentences and short stories. The combinations generated by the dice encouraged them to establish logical connections, arrange events in sequence, and imagine different solutions for continuing the narrative. Storytelling represented the central artistic component, while symbol recognition, association, sequencing, and cause-and-effect relationships supported mathematical and logical thinking. The activity encouraged sensory exploration, verbal expression, imagination, and active listening to the ideas of others.

Ireland: Rainbows and Leprechauns

The activity inspired by Ireland combined cultural storytelling, scientific discussion, artistic creation, and physical movement. Starting from the legend of the leprechaun and the hidden treasure at the end of the rainbow, the children discussed the colours of the rainbow and the relationship between light and water in its formation. They created rainbow-themed products and completed a motor course containing obstacles and visual clues. To reach the hidden "gold," they followed a sequence of steps, maintained their balance, changed direction, and oriented themselves in space. Mathematical elements included comparison, succession, and spatial relationships, while the design and completion of the course involved planning and practical problem-solving. The activity generated sustained participation and encouraged coordination, perseverance, and cooperation.

Romania: Tradition, Science, and European Identity

The activity dedicated to Romania connected cultural identity with scientific exploration and collaborative construction. The children discovered elements of Romanian tradition by observing and tasting traditional food products. They also created the flag of the European Union as a group task, counting and positioning the twelve stars in a circular arrangement. This required number recognition, spatial organization, cooperation, and attention to the final configuration. The scientific component consisted of observing dandelions placed in coloured water. The children

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examined the flowers over time, formulated simple predictions, and discussed the changes they noticed. The activity brought together cultural symbols, natural science, mathematics, visual organization, and collaborative work, while helping the children connect their Romanian identity with belonging to the wider European community.

Observed Outcomes and Discussion

The activities carried out within the **"Traveler in Europe"** project generated a high level of participation among the preschool children. They showed interest in the materials, asked questions, offered explanations, made choices, and contributed to both individual and collaborative tasks. Engagement was particularly visible when learning involved direct manipulation, movement, sensory exploration, construction, music, or storytelling. These observations support the idea that, in early childhood education, STEAM is most accessible when its components are integrated into concrete and meaningful experiences rather than presented as separate disciplinary content [2].

Curiosity and simple inquiry behaviours were observed during several activities. In the German construction task, children tested different arrangements and noticed that a narrow or uneven base could affect the stability of a structure. They changed the position of pieces and attempted new solutions when their constructions collapsed. In the Romanian activity, they formulated predictions about the dandelions placed in coloured water and followed the visible changes over time. Such experiences encouraged observation, questioning, prediction, testing, and reconsideration. These behaviours are consistent with the inquiry and problem-solving orientation frequently identified in early childhood STEM activities [3].

Mathematical thinking appeared naturally across the project. The children counted objects, compared sizes, recognized geometric forms, reproduced rhythmic sequences, followed ordered steps, and organized elements in space. These processes were not presented as isolated mathematical exercises but were embedded in practical and creative challenges. For example, the children considered shape, size, position, and balance while constructing buildings, used repetition and succession during musical games, and counted and arranged the twelve stars of the European Union flag in a circular form.

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The project also created opportunities for communication and cooperation. Children discussed possible construction solutions, listened to stories created by their peers, shared materials, followed common rules, and contributed to group products. The mixed-age structure of the group allowed different forms of involvement. Some children completed tasks independently, while others participated through observation, verbal contribution, material selection, or cooperation with peers and the teacher. These differences were treated as natural expressions of individual developmental levels rather than as unequal learning outcomes.

Artistic and verbal expression supported the integration of the entire project. Music and movement facilitated participation in the Spanish activity, while illustrated dice and thematic materials encouraged children to create narratives inspired by Greece. Colour, design, dramatic expression, and symbolic play helped them represent ideas that could not always be communicated through formal explanations. The arts therefore functioned not merely as decoration or as a final product, but as a way of investigating, organizing, and communicating knowledge.

The cultural framework gave coherence and emotional meaning to the STEAM experiences. The children encountered music, legends, architecture, traditions, national symbols, and European symbols through activities adapted to their age. The purpose was not to transmit an extensive amount of geographical information, but to encourage openness, curiosity, and respect toward cultural diversity. This orientation is consistent with UNESCO's recommendation that culture and the arts should be integrated into education from early childhood and used to promote creativity, intercultural understanding, and appreciation of diversity [4].

The observations must nevertheless be interpreted within the limits of the project. The activities were implemented with one mixed-age group, over a limited period, and without standardized assessment instruments or a comparison group. Therefore, the project cannot demonstrate causal effects or measurable progress attributable exclusively to the STEAM approach. Its value lies in documenting feasible classroom practices and illustrating how cultural topics can become meaningful contexts for integrated, playful, and developmentally appropriate learning.

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Conclusions

The “**Traveler in Europe**” project illustrates how STEAM education can be integrated naturally into early childhood activities through an engaging intercultural theme. The imaginary journey through European countries created a coherent context in which children could explore music, stories, architecture, natural phenomena, cultural symbols, movement, and artistic expression. Rather than approaching science, technology, engineering, arts, and mathematics as separate areas, the project connected them through practical and meaningful learning experiences.

The selected activities showed that STEAM education at preschool level does not require complex equipment or predominantly digital resources. Construction pieces, natural materials, illustrated dice, musical resources, movement courses, flowers, colours, and cultural symbols became tools for observation, investigation, planning, creation, and problem-solving. The educator’s role was to organize stimulating contexts, provide appropriate materials, ask guiding questions, and allow children to test ideas and identify solutions.

Pedagogical observations indicated active participation, curiosity, cooperation, creative expression, spatial organization, logical sequencing, and the use of simple inquiry strategies. These manifestations should not be interpreted as quantitatively measured outcomes, but they offer relevant evidence of children’s involvement in the learning process and of the practical possibilities offered by an integrated STEAM approach.

The project also demonstrated that cultural education and STEAM learning can support each other. Exploring European cultural diversity gave meaning to the practical tasks, while the STEAM activities helped children encounter cultural information through direct experience rather than memorization. This combination encouraged both curiosity about the wider European space and appreciation of Romanian cultural identity.

The experience can be adapted to other preschool groups by selecting cultural themes and materials according to children’s ages, interests, and available resources. Future implementations could include more systematic observation tools, children’s portfolios, comparative assessments, or longer-term documentation to examine changes in particular competencies. Overall, integrated and play-based STEAM

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experiences can transform familiar classroom materials and cultural topics into valuable opportunities for exploration, collaboration, creativity, and discovery.

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