2024-2-FR01-KA210-SCH-000286488

Specifications

Petit Bridge at School model

Erasmus+
Enriching lives, opening minds.

Co-funded by the European Union

Contents

Erasmus+
Enriching lives, opening minds.

Co-funded by the European Union

Co-Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

I. Introduction

The *Petit Bridge At School* (PBAS) project, co-funded by the European Union and initiated by the French Bridge Federation (FFB), in partnership with the Nederlandse Bridge Bond (NBB), the Polish Bridge Union (PBU) and the University of Vienna, aims to introduce Petit Bridge to primary schools in France, Poland and the Netherlands.

The purpose of this project is the educational challenges faced by pupils aged 6 to 8, particularly those from disadvantaged backgrounds. The project aligns with Erasmus+ priorities on inclusion and equal opportunities by using Petit Bridge as an innovative pedagogical tool to improve the learning of mathematics and socio-cognitive skills.

The specific objectives and expected results of the PBAS project are as follows:

- To create a standardised educational model that can be adapted on a European scale, including lessons learned from the French experience and thanks to collaboration between bridge and education experts.
- To test and evaluate Petit Bridge as a teaching tool by collecting quantitative and qualitative data from around 100 pupils in 5 schools per country, with one pilot class per school.
- Provide a complete teaching kit (teacher's guides, fun resources, digital media) to ensure the sustainability of the programme after the end of the project.
- Promoting equal opportunities by targeting schools in socio-economically disadvantaged areas using the Socio-Economic Position Index.
- Stimulate students' interest in STEAM (Science, Technology, Engineering, Arts and Mathematics) subjects by integrating a strategic game approach that facilitates the learning of mathematics.

1. Purpose of the specifications

This document aims to define an effective, inclusive and accessible teaching model that can be implemented in a variety of educational contexts while respecting the following characteristics:

- Adaptability to education systems: adjusting the model to school curricula and teaching methods specific to each country.
- Educational effectiveness: development of skills in mathematics, logical reasoning, cooperation and problem solving.
- Cognitive and psycho-social development: improved planning, emotional management and teamwork.
- Ease of implementation and sustainability: creation of a structured a structured and sustainable programme that can be reproduced.
- Universal accessibility: ensuring that the model is inclusive and applicable to all types of students, regardless of their educational or socio-economic level.

2. Technical specifications of the Petit Bridge game

Petit Bridge, created in 2018 by the French Bridge Federation, is a card game derived from bridge, specially designed for children aged 6 and over. It consists of 40 cards divided into four families of 10 cards each, and the suits are more strongly differentiated (blue, green, yellow, red) than in classic bridge (Spades, Hearts, Diamonds, Clubs), to better match the needs of children aged 6 to 8. Each colour is associated with a specific theme: the yellow cards illustrate clothes, the reds mean of transport, the greens fruit and vegetables, and the blues animals. These themes offer an additional educational dimension, allowing the cards to be used as a lever for language sessions focusing on vocabulary.

3. Development of mathematical and cognitive skills

The table below sets out the key areas and skills developed using Petit Bridge, highlighting its impact on children's mathematical, cognitive and social skills.

Domain	Skills developed
Mathematics	Numeration, comparison, basic operations, probability, logical reasoning
Cognition	Working memory, anticipation, strategy, cognitive flexibility
Social skills	Cooperation, communication, emotional management, respect for rules

II. Study and comparative analysis of education systems

A preliminary study of the French, Polish and Dutch education systems has been carried out for children aged 6 to 8. There are some notable differences between the three systems, which are summarised below.

1. Education systems

1.1. France

The French education system is highly centralised, with a national curriculum defined by the Ministry of Education, guaranteeing uniformity of teaching throughout the country. Education is compulsory from age 3 to 16, and children aged 6 to 8 attend primary schools, which is part of cycle 2 of fundamental learning, comprising CP (6-7 years), CE1 (7-8 years) and CE2 (8-9 years).

This cylce focuses on having a good command of French language, the acquisition of the first elements of mathematics and the development of basic knowledge, in a context where a multi-skilled teacher is responsible for all subjects and where pupils remain in the same class throughout the year.

In addition, the system emphasises academic rigour while gradually integrating innovative and inclusive teaching approaches, introducing complementary subjects such as science, history, geography and the arts to meet the diverse needs of pupils.

1.2. Poland

The Polish education system, which is compulsory from age 6 to 19, is based on a rigorous structure combining tradition and modernity. From the age of 6, children enter a compulsory preparatory class known as "class zero", then start primary school at the age of 7, which constitutes the first fundamental cycle of the school system and lasts 8 years, until the age of 15. Children aged between 7 are enrolled in the first years of grammar school, thus ensuring that education is accessible to all and standardised nationwide.

The reform of the education system launched in 1999 has modernised and harmonised teaching, placing the emphasis on student autonomy and reasoning.

In addition, the system favours practical and integrated approaches, such as learning mathematical modelling and problem-solving strategies, while promoting local initiatives to adapt teaching methods to the specific needs of school communities.

1.3. Netherlands

The Dutch education system is characterised by its flexibility and individualised approach, allowing teaching to be tailored to the specific needs of each pupil. In the Netherlands, primary school, known as 'basisschool', lasts for 8 years (from age 4 to 12) and is organised in 'groups' rather than traditional classes.

The teaching approach emphasises personality development, critical thinking, teamwork and empowerment, while giving priority to learning by doing and interaction with real-life situations. Pupils benefit from a system of appreciation and praise rather than a formal grading system and are often given the opportunity to choose their daily subjects.

In addition, a 'School Council' allows pupils to participate actively in decisions concerning their school, thereby reinforcing equality between pupils and adults. Finally, although schooling is compulsory from the age of 5 (most children start at the age of 4), a non-compulsory guidance test is offered in the final year of primary school to help with the transition to secondary education.

Although these three education systems share the common goal of educating children aged 6 to 8, they differ significantly in their structure, pedagogical approach and educational priorities. These distinctions illustrate the richness and diversity of educational practices in Europe, with each system contributing in its own way to the training of tomorrow's citizens.

2. Analysis of mathematics curricula for pupils aged 6 to 8

2.1. France

In France, the mathematical skills of children aged 6 to 8 are developed through Cycle 2 of primary school, known as the "cycle des apprentissages fondamentaux". The main skills covered include numbering and calculations, with the recognition and manipulation of numbers up to 10,000, as well as the simple operations of addition and subtraction. Logical reasoning is also a priority, aiming to understand relationships between numbers, order and comparison. In addition, pupils are introduced to simple mathematical problem solving and modelling, helping them to develop logical thinking strategies.

2.2. Poland

The Polish mathematics curriculum for pupils aged 7 (Klasa I-II) focuses on the use and creation of information. Pupils are encouraged to organise data and communicate results in a clear and structured way. Mathematical modelling also features prominently, with an introduction to basic operations and number logic, enabling students to better understand the link between abstract concepts and their concrete applications. Problem-solving strategies are developed through the application of mathematical concepts in a variety of contexts, encouraging a practical and contextualised approach to learning.

2.3. Netherlands

In the Netherlands, the mathematical skills of children aged 6 to 8 focus on number structuring, with an emphasis on understanding the relationships between numbers and their hierarchy. The teaching approach is individualised, offering great flexibility in learning according to the level and specific needs of each child. Pupils are also confronted with concrete problems that relate directly to their everyday lives, encouraging the acquisition of mathematical skills through real, practical situations. This not only develops their understanding of mathematical concepts but also makes learning more relevant and committed.

The mathematics curricula in France, Poland and the Netherlands share a common objective: the acquisition of fundamental skills in numeracy, arithmetic, logical reasoning and problem solving. However, each country adopts distinct pedagogical approaches, ranging from a structured framework in France, combining academic requirements and pedagogical adaptations, to practical modelling in Poland, to an individualised and contextualised approach in the Netherlands. These differences reflect national priorities and methods adapted to the needs of pupils, while offering varied perspectives for the development of mathematical skills in young children.

3. Performance in mathematics: TIMSS and PISA results

The mathematical performance of French, Polish and Dutch pupils in the international TIMSS and PISA studies reflects the effectiveness and limitations of each country's education systems, particularly in terms of equity, institutional stability and pedagogical adaptation.

3.1. France

The results of French pupils in mathematics are worrying, with a score of 484 points in TIMSS 2023, well below the European average (524 points). Only 3% of pupils reach an advanced level, while 17% have serious difficulties. PISA 2022 confirms this trend, with a score of 474 points, down 21 points on 2018. These figures highlight several weaknesses in the French education system:

- Widening inequalities: The gap between the strongest and weakest pupils is one of the highest in Europe, with a strong correlation between social background and educational success.
- Lack of pedagogical continuity: Successive curriculum reforms (2013-2022) have resulted in a lack of stability, limiting the effectiveness of new approaches.

- Inadequate teacher training: The integration of modern teaching methods, such as problem-based learning, remains uneven across schools.

Despite several recent initiatives inspired by Asian models (Singapore method, verbalisation of reasoning), France is struggling to reverse the trend and ensure that pupils improve their overall skills.

3.2. Poland

Poland has made historic progress in mathematics since 2003, thanks to reforms focusing on STEM (Science, Technology, Engineering and Mathematics) teaching. TIMSS 2023 illustrates this dynamic with a score of 546 points, placing Poland among the top 10 countries in the world. The improvement in the percentage of high-achieving pupils and the reduction in the number of pupils experiencing difficulties testify to a general rise in skills.

However, PISA 2022 shows a drop of 26.7 points since 2018, probably because of the 2018 reform abolishing gymnasiums (the equivalent of junior high school), which has led to breaks in educational pathways.

The strengths of the Polish education system include:

- Structured and demanding teaching: A strong STEM focus enables students to develop strong logical reasoning and problem-solving skills.
- The proportion of pupils with low results is falling steadily.
- Curricular flexibility: Past reforms have encouraged progressive and coherent learning.

However, the Polish system is facing challenges linked to recent reforms: the abolition of gymnasiums has led to instability and heterogeneity in learning, which explains the drop in PISA results.

3.3. Netherlands

The Dutch education system has historically been recognised for its effectiveness and inclusiveness. TIMSS 2023 shows that scores have remained stable over the past 20 years, with a low proportion of students in difficulty (2%). The Dutch teaching approach is based on teacher autonomy and practical learning, encouraging an applied understanding of mathematics. However, PISA 2022 reveals a worrying drop of 26 points in four years, suggesting difficulties in adapting to 21st century skills.

The strengths of the Dutch system remain:

- A high level of educational equity: Few students with severe difficulties thanks to individualised and inclusive teaching.
- Institutional stability: Unlike in France, educational programmes evolve gradually, without sudden reform.
- Practice-based teaching: The approach emphasises the application of mathematics to real-life situations, which limits the differences in level between students.

However, the recent fall in PISA results suggests that this model may be reaching its limits in the face of new educational demands, particularly in terms of abstract reasoning and managing uncertainty.

The results of international studies show that performance in mathematics depends not only on the academic level of pupils, but also on the stability and coherence of education systems. Each country can learn from the successes and limitations of others to improve its educational approach and ensure that its pupils have a better command of mathematics.

4. Approach to developing psychosocial skills

4.1. France

Since 2022, France has been rolling out a multi-sectoral national strategy for the development of psychosocial skills (PSC) for children and young people aged 3 to 25. This initiative, which is being implemented progressively throughout the school system, promotes a comprehensive approach. Specific programmes are put in place to help pupils regulate their emotions, communicate effectively and develop empathy. These initiatives aim to strengthen social cohesion within the grade and

improve pupils' interpersonal skills. The education system places particular emphasis on managing emotions, with teaching tools that encourage children to listen to each other and help each other, with the aim of creating a harmonious and caring learning environment.

4.2. Poland

The approach to psychosocial skills in Poland is less formalised, but local initiatives are commonplace in schools. These programmes often focus on developing cooperation and mutual respect between pupils. The emphasis is on interpersonal relations and constructive conflict management. Although less structured, this approach reflects a desire to promote values of mutual aid and inclusion within the school community, while supporting pupils in their personal and social development.

4.3. Netherlands

In the Netherlands, the approach to develop psychosocial skills focuses on the autonomy and well-being of pupils. Programmes include activities focusing on empathy, conflict resolution and stress management, contributing to children's personal development. Education in managing emotions and developing social skills is a key element of learning, enabling pupils to better understand their own emotions and those of others. This approach aims to prepare pupils to become autonomous individuals, capable of managing their social relationships and participating actively in the life of the school community.

The development of psychosocial skills in France, Poland and the Netherlands varies in terms of structure and formalisation, but all the education systems emphasise the importance of empathy, managing emotions and cooperation. In France, since 2022, a national strategy has gradually provided a framework for integrating psychosocial skills into the education system. In Poland, local initiatives focus on cooperation and mutual respect, while in the Netherlands, the emphasis is on the autonomy and well-being of pupils. These approaches reflect the growing importance of emotional and social education in preparing pupils for a harmonious and balanced future.

5. Alignment of the PBAS project with curricula

The Petit Bridge At School project is based on a country-specific approach, seeking to build on the unique strengths of each education system to provide a coherent and effective pedagogical approach. In the teaching of mathematics, PBAS focuses on key skills such as logical reasoning, numbering and problem-solving strategies. This approach draws on practices observed in France, where academic rigour and the knowledge structuring are essential, in Poland, where mathematical modelling and the concrete application of concepts are favoured, and in the Netherlands, where the emphasis is on individualisation and the use of practical problems linked to everyday life.

However, the performance gaps revealed by the TIMSS and PISA studies call for a differentiated adaptation of the PBAS programme. In France, where results in mathematics are worrying and inequalities are marked, PBAS will need to reinforce pedagogical continuity and encourage approaches such as the verbalisation of reasoning and problem solving. In Poland, where performance is solid despite the effects of recent reforms, PBAS will be able to structure learning to avoid breaks in the school career. In the Netherlands, where education is reputed to be inclusive but where a decline in performance has been observed, it will be relevant to reinforce abstract reasoning while maintaining an applied approach.

In parallel, for the development of psychosocial skills, PBAS promotes cooperation, autonomy and emotion management, considering the priorities of each country: in France, the integration of psychosocial skills into school curricula, in Poland, local initiatives to promote cooperation, and in the Netherlands, the approach based on empathy, conflict management and student autonomy. These dimensions are essential to meet contemporary educational challenges and promote balanced learning between academic and socio-emotional skills. PBAS offers an enriched approach adapted to each context, to support students in their cognitive and socio-emotional development, while considering the strengths and challenges of each education system.

6. Conclusion and recommendations

The preliminary study of mathematics and psychosocial skills curricula in the three countries revealed a great deal of variability in teaching methods, pedagogical priorities and cultural approaches. This diversity represents a richness, but also a challenge for implementing of the PBAS project. To ensure the successful adaptation of the programme, it is essential that the game and the teaching methods proposed by PBAS are adapted to the specific approaches of each country. Adequate teacher training will be crucial to ensure that the programme is applied in an optimal and consistent way in the different national contexts. In addition, it will be necessary to incorporate a continuous evaluation of the impact of the programme on pupils, to adjust and improve its effects in real time. PBAS applies a STEAM (Science, Technology, Engineering, Arts, Mathematics) approach by integrating creative and strategic elements into mathematics learning, which fosters pedagogical innovation and student commitment. This approach enriches the teaching of mathematics by giving it a more interactive and interdisciplinary dimension, while stimulating pupils' curiosity and creativity. The project therefore represents a real opportunity for educational innovation, with great potential for transforming teaching practices in Europe by encouraging the emergence of more inclusive and flexible learning models that are adapted to the needs of 21st century pupils.

III. Teaching and learning progression

The PBAS project is based on a 9-session learning progression for Petit Bridge. This structured teaching programme enables pupils aged 6 to 8 to gradually develop their skills. It combines mathematical learning, cognitive development and psychosocial skills, incorporating strategic elements that reinforce logic and cooperation.

The learning sessions will take place over 2 sessions to give the pupils time to assimilate the concepts studied.

The 9 sessions are organised as follows:

- session 1: Pre-test
- session 2: Discovering the material and first rules
- session 3: A team game
- session 4: The dummy
- session 5: Winning Cards
- session 6: Almost Winning Cards
- session 7: Practice
- session 8: The tournament
- session 9: Post-test

The joint use of a pre-test (before the teaching intervention) and a post-test (after the intervention) enables the gain in knowledge or skills attributable to the teaching activity to be evaluated objectively. This method makes it possible to compare learners' results before and after the implementation of the project, and thus to quantify the direct effect of the intervention.

Here is a presentation of the sessions detailing the learning goals and the mathematical and psychosocial skills involved.

Session 2 - Discovering the material and the first rules

Main aim: Acquire an initial familiarity with the cards and how the game works.

Mathematical skills

- Numeration and ordinality
    - Identify and understand the value of numbers from 1 to 10.
    - Compare numbers and sort cards by value.
- Additive and distributive structures
    - Understand how the cards are dealt in the deck: 4 suits x 10 cards = 40 cards.
    - Assess the number of cards held by each player after dealing.
- Additive decompositions and complements to 10
    - Anticipate the number of cards to be played.
    - Lay the groundwork for the mental representation of quantities**.**

Cognitive issues and the development of executive functions

- Active memorisation: remember the 4 suits and the values of the cards.
- Cognitive flexibility: moving from organising cards by value to organising them by colour and value.
- Fine motor skills and coordination: card handling, fair distribution.
- Developing respect for instructions: respecting the order of play, understanding sorting and classification instructions.

Session 3 - A team game

Main aim: To understand the importance of team play and the strategic use of cards.

Mathematical skills

- Comparing numbers and managing resources
    - Understand that playing the strongest card too early can be a strategic mistake.
    - Observe the relative value of the cards in a round.
- Additive structures and complements to 10
    - Analyse the number of cards remaining after each trick.
    - Evaluate the points scored and subtract them from the available total.

Cognitive and psycho-social issues

- Anticipation and managing impulsiveness: don't play your best cards immediately
- Collective decision-making: observe your partner's play.
- Emotional regulation: learning to deal with frustration when a card is "beaten" by a stronger one.
- Notion of long-term strategy: understanding that holding onto good cards can be more advantageous than playing them immediately.

Sessions 4 - The dummy

Main aim: To introduce the notion of the dummy, a player who exposes his cards and follows his partner's instructions.

Mathematical skills

- Exploring probabilities and game configurations
    - Observe all the dummy's cards and deduce the strategic possibilities.
    - Calculate the best combinations to optimise team play.
- First steps towards mathematical inference
    - Using the cards on display, anticipate the best options.
    - Understand that some cards are still in play, but not visible, which introduces the notion of implicit probabilities.

Cognitive and psycho-social issues

- Developing cooperation and leadership
- Managing strategic vision: learning to analyse a complete situation rather than focusing on a single card.
- Working on confidence and communication: observing verbal and non-verbal language when giving instructions and developing active listening and understanding of the implicit rules of the game.

Session 5 – Master cards

Main aim: Observe the dummy's game and identify the master cards.

Mathematical skills

- Identifying and classifying numbers
    - Determine which are the winning cards by looking at the visible cards.
    - Compare the values and understand that a card is called the winning card if no stronger card is still in play.
- Logical reasoning and mathematical inference
    - Deduce the number of winning tricks for a side based on the winning cards detected.
    - Develop strategies to maximise the use of winning cards.

Cognitive and psycho-social issues

- Developing working memory: observing and remembering which cards have already been played.
- Deduction and analysis: predict how to use the winning cards to optimise tricks.
- Team communication: strengthening players' ability to share information clearly and usefully.

Session 6 – Master or almost… Promoting cards!

Main aim: Understand the concept of establishing a suit and learn how to turn potential winners into actual winners.

Mathematical skills

- Advanced understanding of number relationships
    - Recognize that a card can become a winner once higher cards have been played.
    - Apply the concept of suit division: breaking a suit into manageable segments to plan distribution.
- Optimizing trick-taking strategy
    - Determine which cards to play to force discards and promote lower-ranking cards.
    - Introduction to strategic elimination of opponents' stoppers.

Cognitive and psycho-social issues

- Anticipation and planning: predicting the effect of your cards on the following rounds.
- Resource management: learning to play your cards cleverly to create opportunities.
- Choose the right moment to play a key card to maximize its potential.

Session 7 - Let's play! - practice

Main aim: Experiment with the game in real-life conditions and discover the concept of trick.

Mathematical skills

- More in-depth comparisons and order relationships
    - Rank several cards according to their value.
    - Deduce which card is the strongest in each group.
- Dynamic additions and subtractions
    - Calculate the number of tricks remaining before the end of the round.
    - Establish a score by counting the won and lost tricks.

Cognitive and psycho-social issues

- Developing working memory: remembering the cards played by opponents.
- Developing cognitive adaptation: reacting according to the visible cards and the actions of the other players.
- Quick analysis: choose the best card to play based on the other cards in play.

Session 8 - The tournament

Main aim: Organise a class tournament to allow students to put into practice all the skills acquired during the sessions. This tournament will also reinforce the concepts of strategy, resource management and cooperation within teams, and will conclude the PBAS project undertaken in the class.

Mathematical skills

- Numeration: Revision of numbers and counting of tricks.
- Optimisation strategy: Analyse the tricks won tricks and optimise card management.

Cognitive and psycho-social issues

- Teamwork: Coordination between partners and strategic adaptation.
- Quick decision-making: Choosing the best cards to play according to the context.
- Concentration: Concentrating on the cards played and anticipating opponents' strategies.

Erasmus+
Enriching lives, opening minds.

Co-funded by the European Union

Co-Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

The tournament thus provides a fun and practical way of applying the skills acquired during the PBAS project sessions, while cultivating a spirit of cooperation and healthy competition.

Erasmus+
Enriching lives, opening minds.

Co-funded by the European Union

Co-Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

IV. Teacher training and support

Training and support for teachers and PBAS ambassadors are essential steps in ensuring that the Petit Bridge programme is implemented effectively and sustainably in schools.

1. Training national trainers

The aim of this training course is to set up a network of national trainers who will be responsible for introducing Petit Bridge into schools and supporting teachers and pupils in its application. Selected from among experienced bridge players, teachers and educators, these ambassadors will be trained in the principles of the game, pedagogical strategies and best teaching practices. Their part also includes promoting the programme in their country to ensure that it is widely spread.

Ambassador training will take place in a hybrid format:

- Face-to-face session to learn key concepts and put them into practice.
- Online modules (translated into all the languages of the partner countries as well as English) to expand on theoretical aspects and ensure flexible access to resources.

2. Impact and sustainability of the programme

The aim is to create a team of qualified trainers and teachers to ensure that the project is implemented consistently and effectively in schools in the participating countries. The training of ambassadors will play a key part in spreading the programme nationwide and raising awareness in schools. In the long term, this structuring will ensure the sustainability and expansion of the project beyond the pilot phase, consolidating its educational impact in Europe.

V. Conclusion

The Petit Bridge At School project is part of an innovative approach aimed at improving the learning of mathematics and psychosocial skills in pupils aged 6 to 8. Using a pedagogical approach structured into 9 sessions, pupils gradually develop skills in numeracy, arithmetic, logical reasoning and cooperation. A study of the education systems in France, Poland and the Netherlands highlighted the need to adapt the content to specific national circumstances to maximise the programme's impact.

The integration of the STEAM approach (Science, Technology, Engineering, Arts and Mathematics) into Petit Bridge teaching strengthens pupils' commitment and stimulates their creativity. In addition, the project focuses on teacher training, a key lever for ensuring consistent and effective implementation of the programme. Finally, ongoing evaluation will enable the content to be adjusted in line with the needs of the pupils and the impact of the project to be optimised.

PBAS represents a real opportunity for educational innovation, encouraging more interactive and inclusive teaching practices.

Erasmus+
Enriching lives, opening minds.

Co-funded by the European Union

Co-Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.