

# PARRISE

These materials are based on the work within the project Promoting Attainment of Responsible Research & Innovation in Science Education (PARRISE)). Coordination: Dr. Marie-Christine Knippels & Frans van Dam, MSc (Utrecht University)

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# Course outline and lesson plans for SSIBL teacher professional development

*University of Jaén, Department of Science Education. Spain*

## Overview course outline

**Duration:** This course consists of 12 hours distributed in 6 face-to-face sessions along two months in the context of a compulsory subject in Science Education offered as part of the third year of a 4-year university degree to accredit graduates as primary school teachers.

**Short summary:** This teacher professional development (TPD) programme adopts a student teacher active approach in which they become acquainted with SSIBL pedagogy through several experiential, reflective and design activities.

The two first sessions offer participants the opportunity to experience the educational potential of a SSIBL approach as students, through an immersion experience. The SSIBL activity selected for this purpose has been designed with a view to its appropriateness for primary school science education. After the immersion activity, participants are asked to present the outcomes of their inquiry on the SSI to the rest of the group and to identify the learning outcomes in terms of content knowledge and competences. A debate on the educational potential of this type of approach compared to more traditional methods is encouraged after the immersion activity. The four following sessions are mainly focused on the development of specific teaching skills necessary for the enactment of a SSIBL approach in real contexts, with a special emphasis on the promotion of designing skills to enhance participant's capacity to bring relevancy into the classroom and to adapt to their students' needs and motivations.

## Objectives

This course allows pre-service teachers to:

- experience and appreciate the educational potential of SSIBL for addressing current needs in science education.
- identify links between particular SSIBL classroom activities and



current science education standards in the Spanish curriculum.

- recognize the characteristic features of the SSIBL approach and how they should be approached in order to enhance science education (quality criteria for SSIBL activities).
- develop specific teaching skills required for the enactment of a SSIBL approach such as identifying relevant scenarios, mapping controversy, identifying links to the Spanish curriculum, supporting students' challenges and developing appropriate lessons plans including guiding questions and consistent assessment criteria.
- become critical practitioners and analyze their SSIBL activities in order to improve them on the basis of quality criteria.
- reflect on how the TPD programme has supported them in the developing an understanding of the SSIBL approach and the acquisition of key teaching skills to enact it.

## Summary

Session	Duration	Main Activity	Approach
<b>1</b>	2 h	Immersion task: Should sales of pangasius be ceased?	<i>Teachers as learners</i>
<b>2</b>	2 h	Outcomes presentation (pangasius fish) and Debate (Educational potential of SSIBL)	<i>Teachers as reflective practitioners</i>
<b>3</b>	2 h	Identification of SSIBL Scenarios. Quality criteria for SSIBL	<i>Teachers as learners, teachers as reflective practitioners and designers.</i>
<b>4</b>	2 h	Designing SSIBL classroom activities	<i>Teachers as reflective practitioners and teachers as designers</i>
<b>5</b>	2 h	Self-evaluation, peer-evaluation and improvement of SSIBL activities	<i>Teachers as reflective practitioners and designers</i>
<b>6</b>	2 h	Presentation of SSIBL classroom activities. Reflection on teaching skills and barriers	<i>Teachers as reflective practitioners</i>



## Lesson plan

### **SSIBL teacher professional development (TPD) course**

*University of Jaén, Department of Science Education. Spain*

### **Pre-service Teacher Primary Education**

#### **Session 1**

**Duration:** 2 hours

**Controversies in the news. Should sales of pangasius be ceased?**

#### **Objectives**

- To experience and appreciate the educational potential of SSIBL for addressing current needs in science education.

#### **Description of activities**

The main purpose of this activity is to give pre-service teachers the opportunity to experience an innovative educational approach as learners aimed at preparing critical citizens to actively participate in a world deeply influenced by science and technology.

Pre-service teachers are presented with recent news from a newspaper on Carrefour's decision for not selling pangae fish anymore. They are asked to formulate research questions and to inquire about the issue in groups.

#### **Materials**

PowerPoint presentation and handouts.

**Resources:** Presentation\_UJA (pp 1-7) and handouts\_UJA (Session 1, pp 1-3)



## Session 2

**Duration:** 2 hours

### **Outcomes presentation and Debate on SSIBL**

#### **Objectives**

- To experience and appreciate the educational potential of SSIBL for addressing current needs in science education
- To identify links between particular SSIBL classroom activities and current science education standards in the Spanish curriculum

#### **Description of the activities**

Participants are asked to present the outcomes of their inquiry on the SSI to the rest of the group and to identify the learning outcomes in terms of content knowledge and competences that they need to have as teachers and those they are trying to promote in their students.

A debate on the educational potential of this type of approach compared to more traditional methods is encouraged after the immersion activity.

#### **Materials**

*Resources:* Presentation\_UJA (pp 8-11) and Handouts\_UJA (Session 2, pp 1-3)



## Session 3

**Duration:** 2 hours

### **SSIBL pillars and Quality Criteria for SSIBL activities**

#### **Objectives**

- To recognise the characteristic features of a SSIBL approach and how they should be approached in order to enhance science education (quality criteria for SSIBL activities).
- To develop specific teaching skills required for the enactment of a SSIBL approach such as identifying relevant scenarios, mapping controversy, identifying links to the Spanish curriculum, supporting students' challenges and developing appropriate lessons plans including guiding questions and consistent assessment criteria.

#### **Description of the activity**

This session starts by revisiting the previous experience of inquiring about an SSI in order to highlight the pillars of a SSIBL approach (SSI, IBL, CE and RRI). The PARRISE project is presented as an international initiative to promote responsible research and innovation (RRI) through science education.

Afterwards, there is a discussion to draw attention to key aspects which unravel the full potential of a SSIBL approach and high quality activities: authenticity, appropriate use of media, nature of science, questioning for reasoning and argumentation, informed decision-making and responsible action-taking.

Finally, pre-service teachers are asked to identify powerful SSIBL scenarios in the media and to map the controversy

#### **Materials**

*Resources:* Presentation\_UJA (pp 12-15) and Handouts\_UJA (Session 3, pp 4-7)



## Session 4

**Duration:** 2 hours

### Design of a SSIBL activity

#### Objectives

- To identify links between specific SSIBL classroom activities and current science education standards in the Spanish curriculum.
- To develop specific teaching skills required for the enactment of a SSIBL approach such as identifying relevant scenarios, mapping controversy, identifying links to the Spanish curriculum, supporting students' challenges and developing appropriate lesson plans including guiding questions and consistent assessment criteria.

#### Description of the activity

After the selection of relevant controversial scenarios and the identification of contrasting views and arguments about the selected SSI, participants are asked to develop a whole lesson plan related to the use of these scenarios for science education.

Pre-service teachers are required to identify links with the Spanish curriculum, and defined learning outcomes and consistent assessment criteria.

Additionally, participants are asked to support students' challenges and prepare appropriate questions to support students' inquiry and reasoning.

#### Materials

**Resources:** Presentation\_UJA (pp. 16-19) and Handouts\_UJA (Session 4, pp 4-7)



## Session 5

**Duration:** 2 hours

### **Self-evaluation, peer-evaluation and improvement of SSIBL activities**

#### **Objectives:**

- To recognise the characteristic features of a SSIBL approach and how they should be approached in order to enhance science education (quality criteria for SSIBL activities)
- To develop specific teaching skills required for the enactment of a SSIBL approach such as identifying relevant scenarios, mapping controversy, identifying links to the Spanish curriculum, supporting students' challenges and developing appropriate lessons plans including guiding questions and consistent assessment criteria.
- To become critical practitioners and analyse their SSIBL activities in order to improve them on the basis of quality criteria.

#### **Description of the activities**

Participants use the quality criteria previously discussed to make self- and peer-evaluation of the SSIBL activities and lesson plans developed. Based on the evaluation, they improve their initial designs to better meet the quality criteria.

#### **Materials**

**Resources:** Presentation\_UJA (pp 20-23) and Handouts\_UJA (Session 5, pp 4-7)



## Session 6

**Duration:** 2 hours

**Educational values of SSIBL activities.**

### Objectives

- To recognise the characteristic features of a SSIBL approach and how they should be approached in order to enhance science education (quality criteria for SSIBL activities)
- To develop specific teaching skills required for the enactment of a SSIBL approach such as identifying relevant scenarios, mapping controversy, identifying links to the Spanish curriculum, supporting students' challenges and developing appropriate lesson plans including guiding questions and consistent assessment criteria.
- To become critical practitioners and analyse their SSIBL activities in order to improve them on the basis of quality criteria.
- To reflect on how the TPD programme has supported them in developing an understanding of a SSIBL approach and the acquisition of key teaching skills to enact it.

### Description of the activities

Student teacher participants present their improved SSIBL activities and discuss their educational value with the whole group, reflecting on potential barriers and the teaching skills necessary to support students learning through SSIBL.

### Materials

**Resources:** Presentation\_UJA (pp. 24-27) and Handouts\_UJA (Session 6, pp 8-9)



## References

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