ERASMUS+ project

- Biotechnology in our life -

DIDACTIC CONCEPT

The project "Biotechnology in our lives", funded by the European Union and coordinated by Bielefeld University, is an international project course with student exchange. The didactic method developed by the student laboratory for this project format is unique in this form. It is an international group puzzle with national core groups and international expert groups.

Learning goals

The forms of learning envisaged in this international project build experience and self-confidence, develop a sense of responsibility for oneself and others, improve one's ability to work in a team, acquire practical skills and know-how, and train the ability to work independently.
This so-called competence acquisition is indispensable in the preparation of students for professional requirements and everyday problems. Learners become active members of society who are able to take their own point of view regarding science and research and represent it in society. Thecoordinator - the studets lab teutolab-biotechnology of Bielefeld University - thus makes an important contribution to basic scientific education and the general education of students.

In the project the pupils work according to the principle of self-organised learning - SOL (Herold, Landherr 2003). This is a learning concept in which both individual and cooperative learning takes place and which is geared towards increasing self-organisation of learners in the learning process. The aim of SOL is to make the student competent for solving tasks or assessing problems independently and appropriately in the situation.

- ➔ Deepening of knowledge and skills through networking of technical and interdisciplinary competences
- ➔ Creation of social competence (conflict ability, willingness to compromise, team spirit, understanding of values, willingness to learn, team spirit...) through the coordination of individual and group work
- ➔ Increasing self-responsibility for one's own learning
- ➔ Creation of individual independence through the systematic development of methodological and learning competencies
- ➔ Mediation and evaluation of project competence (communication, team spirit, presentation...)

Group puzzle

One way of carrying out self-organized forms of learning is the so-called group puzzle (Aronson 1978).
The group puzzle is an individual and cooperative learning method, in which pupils work on various topics in groups based on the division of labour and communicate these to their group members in newly composed groups. Since the group composition changes several times during this teaching method, the group puzzle is called jigsaw.

In a group puzzle, the members of a group are divided into small groups called core groups. Each core group handles the overall topic, but each member individually does a different part. Then all the "experts" of a sub-area meet to compare their results. The new groupings are called the Expert Group. The experts then return to their home group to present their specialty to the other group members. Finally, the whole topic is checked with all group members.

1. In the first step, the material must be worked out independently.
2. In the expert groups, differences in the quality of individual work are balanced, mutually informed and helped.
3. When working in the expert groups, the experts present their results and receive feedback.
4. If necessary, an increased meeting takes place in the regular and expert groups.

Implementation in the student laboratory

In the project, students work in national core groups and international expert groups.
Six nationalities and four pupils per nationality participate in the project, which are thus divided into six core groups and four expert groups (see Figure 1).

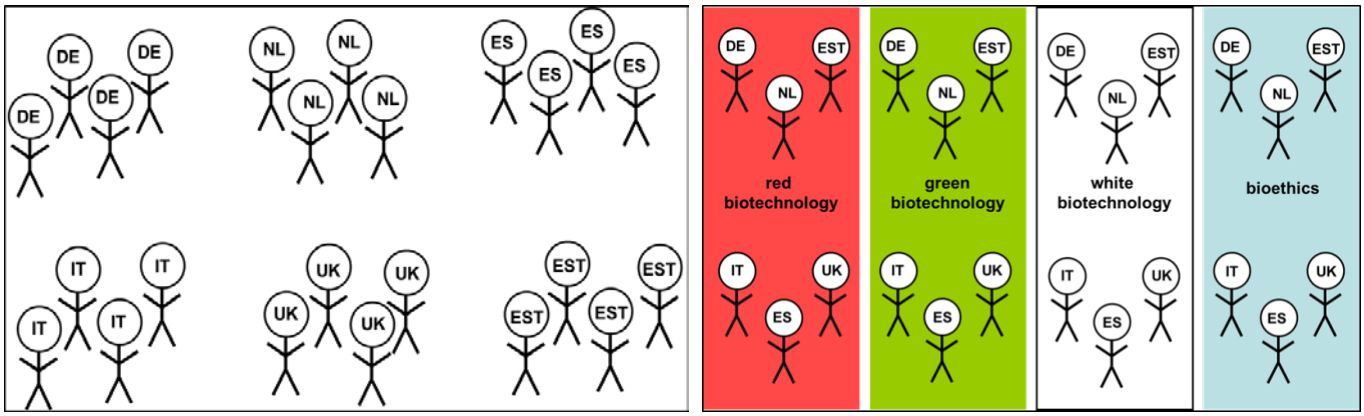

Figure 1: ***national core goups and international expert groups*** *(example project year 2015/2016)*

The international project course according to the method of the international group puzzle developed by teutolab-biotechnologie includes three project meetings per project year in which the students work in the international expert groups. Before the first project meeting, individual training in the topic takes place. Between project meetings, students work both individually and in the national core groups (see Figure 2).

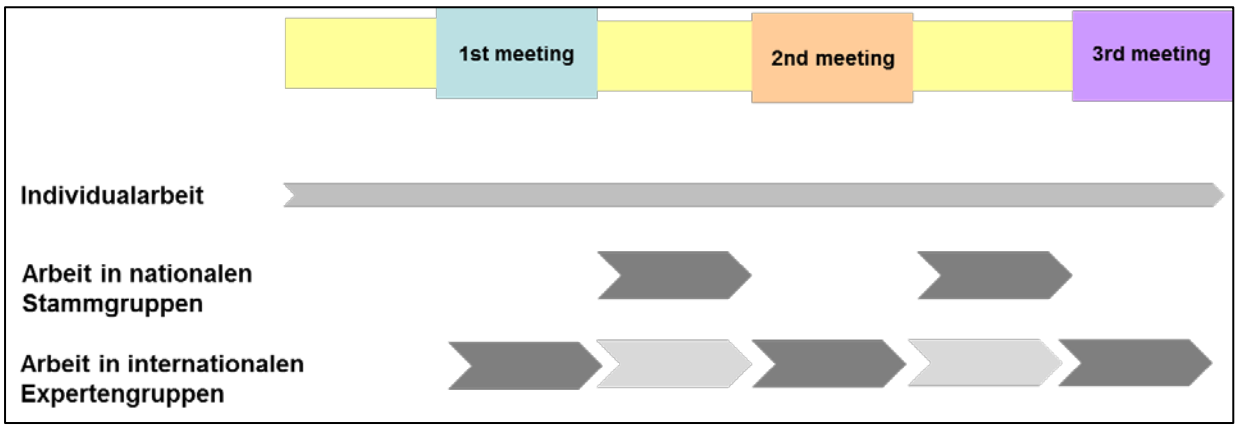

*Figure 2**: Group compositions in the group puzzle during the project***

- ➔ Individual work takes place during the entire project period.
- ➔ Work in the national home groups takes place mainly between project meetings.

  The work in the international expert meetings mainly takes place during the project meetings. Part of the project meetings are not only international teamwork, but also expert lectures, discussion rounds, workshops and laboratory experiments as well as visits to biotechnological companies. In addition to self-study by the students, the project meetings also serve as further training for the students.

  Work in the international expert groups can continue through the use of the eTwinning internet platform (a secure space on the internet developed by the EU for exchanging information, documents...).

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