

Title

Project-based Learning Triangle area

Author(s)

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Short description/ main idea

Students must be engaged in a highly motivating learning experience, which is closely related to the tasks and challenges of the real world. Therefore, emphasis must be given on the learning-by-doing, where the activities in authentic context are strongly emphasized, which means the skills needed in working life, such as being able to work in teams, working in self-guided manner, and assessing of own actions (Thomas, 2000).

Learning objectives

Cognitive - Knowledge: Conceptual

Cognitive - Process: To apply

Affective: To form and follow a system of values

Psychomotor: To perform independently, skillfully and precisely

Learning activities

Phase 1: Definition of the Project Goal

Activities

1.1: Organize into Groups

1.2: Presentation of the New Question/Problem

1.3: Discussion

Phase 2: Planning the Project

Activities

2.1: Discussion among the Group Participants

Phase 3: Doing the Project Work

Activities

3.1: Collection of Information

3.2: Synthesis of Information

3.3: Create Project

Phase 4: Presentation of the Outcomes

Activities

4.1: Project Outcomes Presentation

4.2: Discussion/Feedback

Phase 5: Assessing the Project Work

Activities

5.1: Summative Assessment

LanguageLanguage

English

Grade & AgeGrade & Age

Age: 16 - 17

Grade: informal context, secondary education

Special needSpecial need

Visual

Domain Domain**Keywords/subjectKeywords/subject**

triangle area, Heron's formula

DifficultyDifficulty

difficult

Learning environmentLearning environment

Computer-based, Simulator

DurationDuration

1 Hours

Teaching approachTeaching approach

Behaviourist: Programmed instruction

Cognitivist: Problem based

Project-based learning aims at giving students a highly motivating learning experience, which is closely related to the tasks and challenges of the real world. Project-based learning also supports learning so called "adult skills", which include skills such as working in teams, working in self-guided manner, and assessing of own actions. Project-based learning is also connected to the idea of attaining transferable skills such as problem solving (Helle et al., 2006).

The projects in Project-based learning are challenging and complex tasks that are based on some topics, questions, or problems that are driving the working in projects. Challenging and complex tasks means here that the tasks must be such that they cannot be accomplished successfully without new learning taking place. The projects at hand usually involve elements from various subjects, which make them multidisciplinary and not bound to any particular subject domain. The nature of the tasks have to be such that it involves learners in various kinds of activities that support the learning, such as designing, problem-solving, decision making, and active investigation. In projects, the learners work autonomously and collaboratively in small groups, whereas the teacher is more in a role of the tutor facilitating the learning process (Henry, 2005).

Assessment strategyAssessment strategy

Self-assessment, Summative assessment

PhasesPhases

1. Definition of the Project Goal

Learning activitiesLearning activities

1.1 Organize into Groups

Description: The teacher divides the class into groups of students and ensures that these groups consist of students with different capacities.

Tools

Software Tools: Text, image, audio or video viewer

Hardware Tools: Computer, Projector

1.2 Presentation of the New Question/Problem

Description: The teacher introduces the new question/problem to the students.

Tools

Software Tools: Text, image, audio or video viewer

Hardware Tools: Computer, Projector

1.3 Discussion

Description: Students discuss about the new question/problem and contribute opinions and ideas and the teacher provides feedback on the students' opinions.

Tools

Software Tools: Text, image, audio or video viewer

Hardware Tools: Computer, Projector

Phases

2. Planning the Project

Learning activities

2.1 Discussion among the Group Participants

Description: Students discuss into the context of their groups about the project to be created and their responsibilities of each group member. The teacher interferes to avoid possible misunderstandings..

Tools

Software Tools: Text, image, audio or video viewer

Hardware Tools: Computer, Projector

Phases

3. Doing the Project Work

Learning activities

3.1 Collection of Information

Description: Each group member collects information about the topics related to their project work. The teacher can support the students by pointing out with questions some topics that the students might have given little or no attention or he/she may have prepared some material for students that serves as a starting point for further inquiries on those topics.

Tools

Software Tools: Search engines VLEs

Hardware Tools: Computer

3.2 Synthesis of Information

Description: After the students have collected the information, they synthesize together the collected pieces of information. The teacher can support the synthesis process by asking questions about various concepts and topics and their relations to each other.

Tools

Software Tools: Text, image, audio or video viewer

Hardware Tools: Computer

3.3 Create Project

Description: Students work collaboratively in order to create their project, while the teacher acts as a facilitator to their efforts.

Tools

Software Tools: Word processor

Hardware Tools: Computer

Phases Phases

4. Presentation of the Outcomes

Learning activities Learning activities

4.1 Project Outcomes Presentation

Description: Each group of students presents the outcomes of the project to others and the teacher.

Tools

Software Tools: Text, image, audio or video viewer

Hardware Tools: Computer, Projector

4.2 Discussion/Feedback

Description: Students answer to questions/comments of other students and the teacher.

Tools

Software Tools: Text, image, audio or video viewer

Hardware Tools: Computer, Projector

Phases Phases

5. Assessing the Project Work

Learning activitiesLearning activities

5.1 Summative Assessment

Description: The teacher assesses the projects created by student groups

Tools

Software Tools: Text, image, audio or video viewer

Hardware Tools: Computer, Projector