VIDU
BIOLOGY

Teacher training plan / goals, procedure and material

"Photos and videos to support learning"

Note: The teacher training plan outlined below is a combination of conceptual elements and experiences from individual teacher workshops in the partner countries of the European project. The explanations are aimed directly at teachers who would like to set up in-service training at their schools.

How can you integrate photos and videos into teaching to expand teaching and learning? How can you devise a visual approach, in digital format, convenient and close to nature? These are some of the core questions of the vidubiology project. The European project team has developed materials which illustrate how a practical application of digital photo and video could be integrated into a biology lesson in school. At the same time the project sought to include teachers in the development and to integrate their experiences into the design of the materials. Workshops took place to strengthen the ideas and the implementation within lessons

Objectives of the training plan

We encourage teachers who want to integrate digital media production into their teaching to invest in adding the necessary technical skill to their competence profile. Which skills and abilities are needed to include digital media in teaching in a target-oriented, pupil-oriented and helpful learning approach? The European Reference Framework for Digital Literacy in Teachers (DigCompEdu, https://ec.europa.eu/jrc/en/digcompedu) provides teachers with a tool to measure their own level of digital media literacy and to identify their personal training needs. The vidubiology training plan gives teachers the opportunity to develop further in their competence areas (area 2), digital resources (area 3) and teaching and learning (area 5) as well as learner orientation. The training plan described below consists of two parts (A/B) which describe a possible training course over a shorter (A) or longer (B) period of time.

The aim is to implement various techniques of photography and videography and to reflect on them as didactic and pedagogical tools during training courses lasting several hours or short, focussed training /micro-training courses.
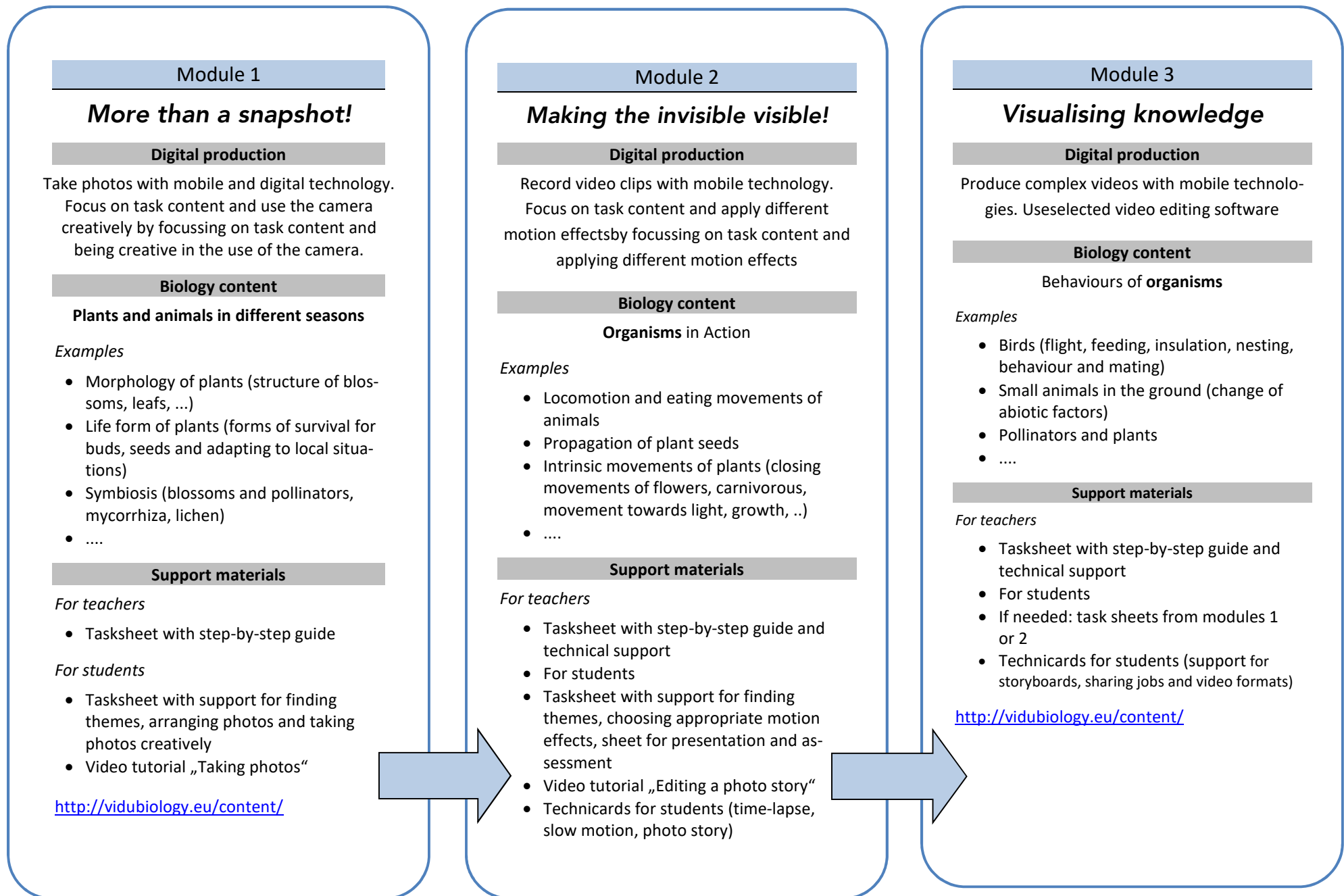
A. Plan for a one-day training course

The plan outlined below can be adapted to the time available and, if necessary, shortened. At least 4 hours should be planned order to implement, evaluate and reflect on the content and techniques of all three vidubiology modules. The length of the individual phases should be adapted to the abilities and previous knowledge of the participants and decided together.

Training plan

Introduction	**Present project with modules and requirements for production**
	- Brief presentation of the goals and the concept of vidubiology are briefly presented with reference to the three modules (→FIGURE 1).
	- Outline the digital production ideas which are derived from modules 1 to 3
	Form groups and prepare for the first practical phase
	- Form groups of 2 or 3 teachers
	- Introduce the subject with reference to the respective curriculum → The biology content must be defined before the training takes places. The following topics/contents are good ideas that have been tested with teachers in the project partner countries:
	    • *Food chain in the ecosystem*
	    • *Morphology & physiology of flowering plants*
	    • *Plants in the "neighbourhood"*
	    • *Adaptation of organisms in the zoo*
	
	- Prepare biological materials (laboratory materials, index cards, posters, etc.), if necessary organisms/objects for activity 2
	- Prepare production technology (mobile devices such as tablet computers) and accessories (e.g. holder for the mobile devices) used by the teachers.

Activity 1 – **Taking photos** **Presentation and reflection**	**Photos - More than a snapshot!** (Module 1) - Brainstorming to get started: What is in your opinion a good photo? - Introduce the creative, technical-focused production of photos (→ VIDEO TUTORIAL on vidubiology YouTube channel) TASK FOR THE 1ST PRACTICAL PHASE USING THE TOPIC "FOOD RELATIONS IN THE ECOSYSTEM" AS AN EXAMPLE: (a) Create a maximum of 10 photos from at least three different photographers (outdoors). (b) Select a "best shot" from each photographer. (c) Present your selection and give reasons for your choice from a professional and technical perspective. - Present your best shots and explain why you chose them - Reflection and discussion based on your own experience of photography: How was the "object of the photo" perceived? Where and how can technology be integrated into the curriculum?
Activity 2 – **Recording video clips**	**Video formats - making the invisible visible!** (Module 2) - Short explanation of selected video formats (→TECHNICAL CARDS from student materials), if necessary with examples from the project (see vidubiology YouTube channel) TASK FOR THE 2ND PRACTICAL PHASE USING THE TOPIC "FOOD RELATIONSHIPS IN THE ECOSYSTEM" AS AN EXAMPLE: (a) Select one consumer & one destructor in each team. (b) Consider which form of movement you can record with the selected animals and which video effect / type of re-

Presentation	cording you can use here (such as slow motion or time-lapse - see technicards). (c) Create a short, meaningful video recording of each of your animals - presentation of selected recordings; collect and document which organisms/objects were recorded
Activity 3 – **Video production**	**Visualising knowledge** (Module 3) - Explain how individual products from activities I and II can be combined and a commentary or additional video can be added - Introduce the purpose of a storyboard in video production (STORYBOARD TEMPLATE → from student materials) - Introduce a video editing program on a screen showing the basic elements: Inserting titles & text, creating transitions, setting tempo, splitting clips, copy and paste, exporting etc. **TASK For the 3rd practical phase using the topic "Food relationships in the ecosystem" as an example:** (a) Sketch a sequence of scenes in your storyboard. You can also use the video clips of the other teams. (b) Produce and edit your video.
Presentation and reflection	- Present the videos, discuss and reflect on the teaching effort, learning benefits and evaluation

Additional
 	
(depending on time available)
	Stop-motion clips – "Flip book cinema"
	- Explain the stop-motion technique, design of stop-motion clips (→ VIDEO TUTORIAL on vidubiology YouTube channel) and embedding in a video production
	   a) Connecting sequences in a video production that brings together individual themes and explanations or serves to explain parts of a theme in short visual sequences
	   b) Independent video production to explain technical concepts and/or simulate/visualise processes
	
	TASKS TO THE EXAMPLE OF THE TOPIC "FOOD RELATIONSHIPS IN THE ECOSYSTEM":
	 a) Produce short stop-motion clips to transfer the real footage of producers, consumers and destructors.
	
	 b.) Produce a stop-motion clip that visualises the food relationships in an ecosystem

Module 1	Module 2	Module 3
More than a snapshot!	*Making the invisible visible!*	*Visualising knowledge*

Module 1 — More than a snapshot!

Digital production

Take photos with mobile and digital technology. Focus on task content and use the camera creatively by focussing on task content and being creative in the use of the camera.

Biology content

Plants and animals in different seasons

Examples

- Morphology of plants (structure of blossoms, leafs, ...)
- Life form of plants (forms of survival for buds, seeds and adapting to local situations)
- Symbiosis (blossoms and pollinators, mycorrhiza, lichen)
- ....

Support materials

For teachers

- Tasksheet with step-by-step guide

For students

- Tasksheet with support for finding themes, arranging photos and taking photos creatively
- Video tutorial „Taking photos"

http://vidubiology.eu/content/

Module 2 — Making the invisible visible!

Digital production

Record video clips with mobile technology. Focus on task content and apply different motion effectsby focussing on task content and applying different motion effects

Biology content

Organisms in Action

Examples

- Locomotion and eating movements of animals
- Propagation of plant seeds
- Intrinsic movements of plants (closing movements of flowers, carnivorous, movement towards light, growth, ..)
- ....

Support materials

For teachers

- Tasksheet with step-by-step guide and technical support
- For students
- Tasksheet with support for finding themes, choosing appropriate motion effects, sheet for presentation and assessment
- Video tutorial „Editing a photo story"
- Technicards for students (time-lapse, slow motion, photo story)

Module 3 — Visualising knowledge

Digital production

Produce complex videos with mobile technologies. Useselected video editing software

Biology content

Behaviours of **organisms**

Examples

- Birds (flight, feeding, insulation, nesting, behaviour and mating)
- Small animals in the ground (change of abiotic factors)
- Pollinators and plants
- ....

Support materials

For teachers

- Tasksheet with step-by-step guide and technical support
- For students
- If needed: task sheets from modules 1 or 2
- Technicards for students (support for storyboards, sharing jobs and video formats)

http://vidubiology.eu/content/

Figure 1: vidubiology-Module with examples for the content and materials (Meier et al., 2020)

B. Micro-training on selected techniques

In addition to the teaching work for teachers, the time frame is often very tight. Therefore, it can be useful to locate a time slot in the week at which micro-training courses take place. The aim of these short teaching and learning units is to get to know selected techniques, to apply them practically and to be equipped to teach with these techniques. The digital techniques listed below and described in the implementation are an essential part of the modules in vidubiology. The duration of a teaching and learning unit depends on the level of the participants and the scope of the technology.

Teaching unit = professional-creative photography (approx. 30-45min)
In this micro-training the participants work out which technical aspects have to be considered in photography and how an object can be staged in its application. Material from module 1 can be used to implement the teaching-learning unit: VIDEO TUTORIAL and STUDENT WORKSHEET.

Teaching unit = video formats to make movement visible (approx. 60min)
In this micro-training, (seemingly) invisible processes, behaviours, structures, etc. are to be videographed with the help of selected video techniques and thus made visible. An essential part of this is the installation of the recording area, which can be located in nature or in the classroom: Which video technology should be used? How should the object be presented? How must the terminal device be positioned to the object? etc. Material from module 2 can be used to implement the teaching-learning unit: VIDEO TUTORIAL and TECHNIQUE CARDS.

Teaching unit = Stop Motion Clips (approx. 30-45min)
The stop motion technique is one of the animated moving image techniques that can be produced with simple means by teachers for learners or by learners for learning. In this micro-training the participants work on the handling of selected apps for stop motion production, create one or more short clips using different materials. Material from module 3 can be used to implement the teaching learning unit: VIDEO TUTORIAL.

Teaching unit = videos for visualizing and explaining (approx. 30-45min, without storyboard)
The production of videos is largely dependent on video editing skills (video editing, sound, etc.) or the preparation and combination of various digital recordings into a "complete video". This micro education requires digital recordings which are either available or made available by the participants from the previous teaching units. After an introduction to a selected video editing tool a storyboard can be written for the video or the video editing can be started directly, depending on the time given. Material from module 3 can be used to implement the teaching-learning unit: VIDEO TUTORIAL

http://vidubiology.eu/content/
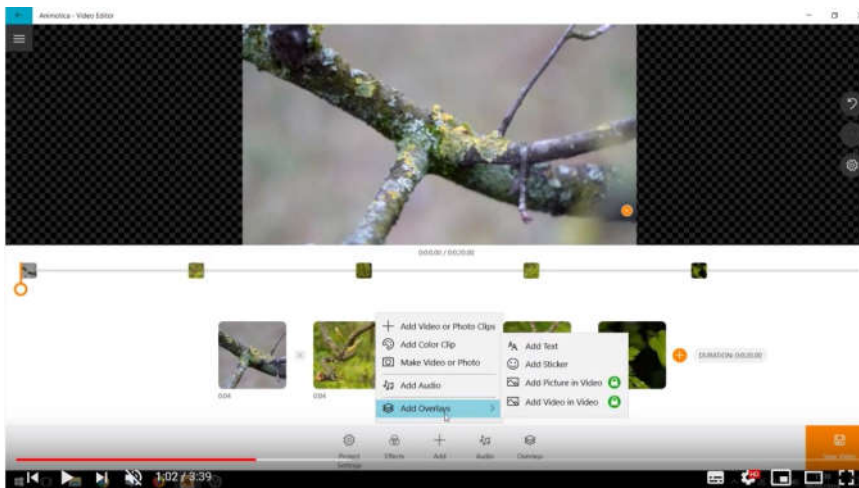
Video Tutorials

Video Tutorial "Taking photos"
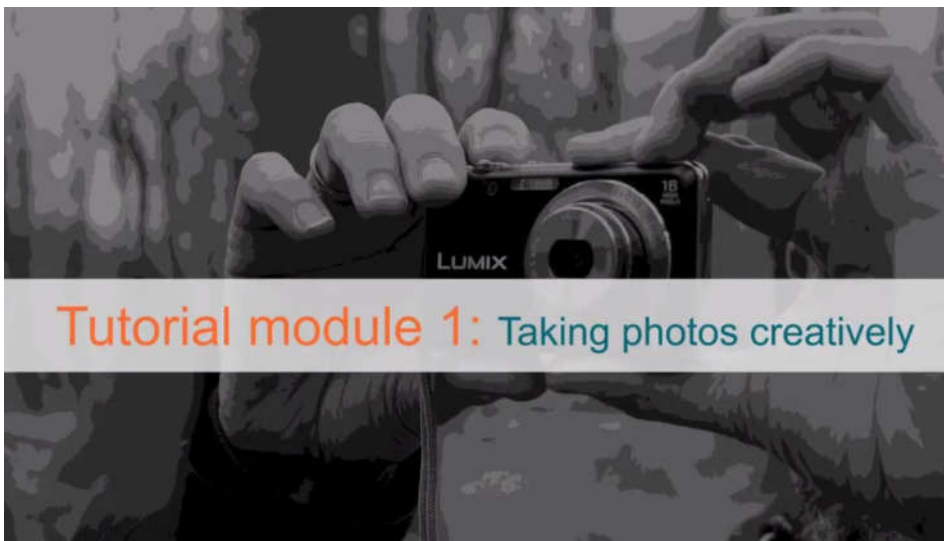
English: https://youtu.be/ujcPaJcr6RM   German: https://youtu.be/hanYXoE_f0M

Video Tutorials "Editing photo stories"

Android / Windows English: https://youtu.be/Zvr5VxR74UQ
German: https://youtu.be/Hz74FGKuMXE

iOs English: https://youtu.be/pFG2b-7KkVs
German: https://youtu.be/dRQFQf9bUUE

Co-funded by the
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Video Tutorial "Timelapse with framelapse"

English: https://youtu.be/QA8JdFv6bMQ

Video Tutorial "Stop-motion Gestaltung"

German with English subtitles: https://youtu.be/YFMUWq9qRfQ