Digitally mapping local biodiversity

CORE PURPOSE:
This scenario develops students' knowledge of local ecosystems and digital mapping skills through outdoor learning. It engages them in scientific understanding of their local area and in species identification via online repositories and interaction with experts. It supports them to use digital media effectively to communicate their knowledge and opinions to others.

NARRATIVE OVERVIEW
I am a high school geography teacher, keen to develop students' mapping skills and knowledge related to land-use and also to explore how digital technologies can give young people a voice about local spaces. My science teacher colleague wants his students to develop the scientific skills of identifying species and understanding habitats. We have seen students benefit from outdoor and experiential learning in the past on field trips and are keen to increase the number of opportunities they have for this sort of learning. Together we create a project in which students use mobile digital technology and GPS/GIS technologies to map land-use and document the habitats of their local spaces. The outcome of the project will be a downloadable interactive guided nature walk for the local community.

Mr Thorne and I work with our colleagues in the Maths department to provide direct instruction on how to use the mobile GPS/GIS technologies and how coordinates work. We then devise a short treasure hunt which involves students using the devices to find a certain place in the local town/school grounds, using specific coordinates, which they then plot on an online map.

Once the students have a good understanding of GPS/GIS and mobile devices, groups of students are allocated certain small areas in the locality which have diverse habitats and uses of land. They add their locations to a central online map. After some direct teaching on methods, they begin the process of documenting the land use and undertake research into what species and habitats exist there. They photograph all the wildlife they find in their area. When they return to the classroom they use a combination of traditional and online classification keys/sites to try to identify all the species. For any problematic identifications the students have pre-arranged access to remote experts/scientists who they can email their photographs or have video calls with. Students discover more about the species they have identified and are taught about monitoring populations. They are also taught to use sensors to monitor data such as humidity and sunlight.

Students consider links between land-use/environmental factors and habitats. Mr Thorne and I ensure that students use scientific ideas and geographical/environmental knowledge to explain phenomena. I also encourage students to consider their views on the future of that space.

Students monitor their small area over a period of a few months, collecting and analysing data and creating short video documentaries/photostories/podcasts as they go. Throughout this process my colleagues and I support the students with their choices of content and how to effectively communicate their knowledge to the chosen audience. We then work with the students to turn their work into an interactive, guided walk that members of the local community can participate in to learn about the local biodiversity. To do this we use mobile digital technologies and either QR codes or mediascape software that allow others to hear the documentaries/see the pictures/hear podcasts the students have created when they are in the physical spaces. The walks are promoted on local travel sites and through community groups and libraries.

TREND/S
Young people are always connected and make heavy use of digital media, this is posing challenges to teachers and education systems who are yet to identify consistent and effective responses

What motivates students? There is an increasing understanding across education systems in Europe - and globally - of how technology and a focus on emotional well-being can be effective to motivate young people, and help them engage with important subjects like Maths, Science and Technology (MST).

Increasing frustration of young people with typical classroom activities

POSSIBLE APPROACHES TO TEACHING AND ASSESSMENT
- Enquiry-based learning
- Direct instruction
- Game-based learning
- Project based learning
- Formative and summative assessment of identification skills
- Outdoor learning

ENVIRONMENT
- The classroom
- Selected locations outside of school eg local park or woodland or could be school grounds
- Classroom
- Online learning environments
- Virtual map

PEOPLE & ROLES
- Teachers – provide direct instruction on how to use the digital technologies and the nature of Geographical Information Systems. They use game-based learning methods to scaffold the young people's development of skills in using the technologies. Teachers also facilitate and guide the students through the project. Direct teaching of/support with online and offline research skills (information literacy), identification skills, maintaining momentum of project over time.
- Students – develop their mapping skills and deepen their understanding of habitats in their local area whilst also exploring using digital media to communicate their experiences to others.
- Remote experts

ACTIVITIES
- Use of GIS/GPS to locate places, creation of interactive online mapping
- Interaction of online and offline spaces
- Production of digital media for communication of specific ideas and perspectives (eg documentary making)
- Species identification and population monitoring
- Communicating environmental knowledge
- All resources and outcomes produced during the project could be shared across countries
- Other activities could be planned to expand and branch out on the original idea, e.g. going back to historical weather records or arranging visits to wildlife parks, also activities that students could carry out in their own time could be considered.

RESOURCES (INCL TECHNOLOGIES)
- GPS enabled mobile technologies
- Laptops
- Digital still and video cameras
- Access to online mapping services
- Online software for creating mediascapes/producing and linking QR codes