nQuire: How can technology help students collaborate and do research together?

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Pathways for learning – 2nd Webinar, 27 July 2020

AFRICAN COUNCIL for Distance Education

TESSA
Teacher Education in Sub-Saharan Africa

nQuire
EXPLORE YOUR WORLD

The Open University

Learning outcomes:

- To learn about:
  - inquiry learning,
  - citizen science,
  - citizen inquiry
- To find out about a technological solution for citizen inquiry
- To take part in a social investigation (peer learning activity)

Poll 1

- Have you ever applied inquiry learning to your teaching? (single select)
  - Yes
  - No
  - Unsure what this is

Inquiry learning

A problem that prompts investigation

Research-based teaching

Learning starts when students become curious about something

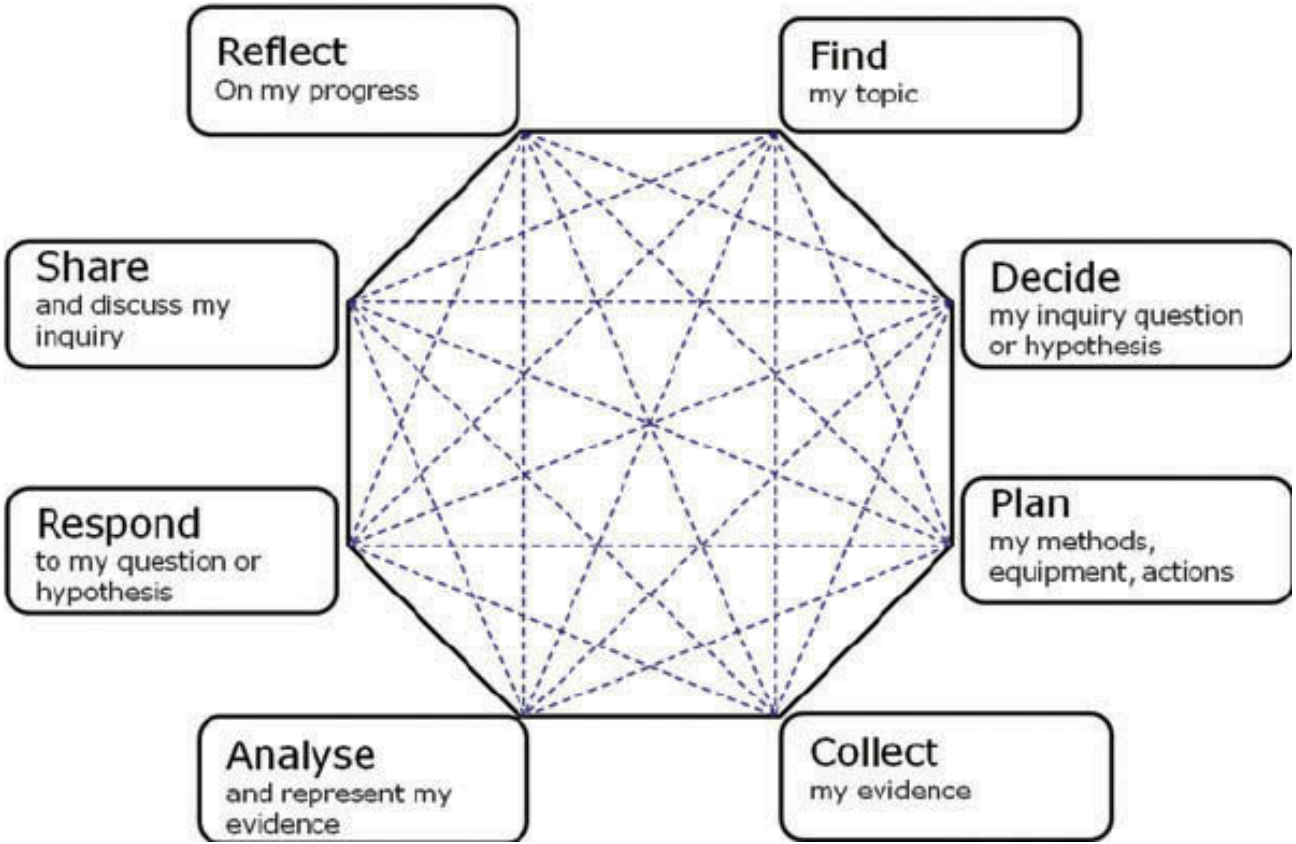
A form of problem-based learning

Learners at the centre of learning

Asking questions, exploring, reflecting

Why is this type of learning timely?

How: Guided or structured inquiry



- Formal education (11-14 years old)
- Explorations in classroom, homes and discovery centres
- Use of mobile and handheld devices
- Investigations e.g., healthy eating, noise and birds

Examples of inquiry

- What are people's nutrition choices for breakfast?
- How do people react to misinformation about Covid-19?
- What species (mammals, birds etc) live in your garden?
- How do heatwaves impact your productivity at work?

Any investigation in any discipline….

Poll 2

What do you know about citizen science? (multiple select)

- This is a way for scientists to do large-scale research
- This is a form of crowdsourcing
- This is all about the public collecting or transcribing data
- This is way for the public to act like scientists
- None of the above

Educational technology

From Wikipedia, the free encyclopedia

"E-learning" redirects here. It is not to be confused with Online machine learning.

Educational technology is "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources".[1]

Educational technology is the use of both physical hardware and educational theoretics. It encompasses several domains, including learning theory, computer-based training, online learning, and, where mobile technologies are used, m-learning. Accordingly, there are several discrete aspects to describing the intellectual and technical development of educational technology:

- educational technology as the theory and practice of educational approaches to learning
- educational technology as technological tools and media that assist in the communication of knowledge, and its development and exchange
- educational technology for learning management systems (LMS), such as tools for student and curriculum management, and education management information systems (EMIS)
- educational technology as back-office management, such as training management systems for logistics and budget management, and Learning Record Store (LRS) for learning data storage and analysis.
- educational technology itself as an educational subject; such courses may be called "Computer Studies" or "Information and communications technology (ICT)".

An **educational technologist** is someone who is trained in the field of educational technology. Educational technologists try to analyze, design, develop, implement and evaluate process and tools to enhance learning.[2] While the term *educational technologist* is used primarily in the United States, *learning technologist* is synonymous and used in the UK[3] as well as Canada.

Education

Disciplines

Evaluation · History · Organization · Philosophy · Psychology (school) · **Technology** (Electronic marking) · International education · School counseling · Special education · Teacher education

Curricular domains

Arts · Business · Early childhood · Engineering · Language · Literacy · Mathematics · Science · Social science · Technology · Vocational

Methods

Case method · Conversation analysis · Discourse analysis · Factor analysis · Factorial experiment · Focus group · Meta-analysis · Multivariate statistics · Participant observation

V · T · E

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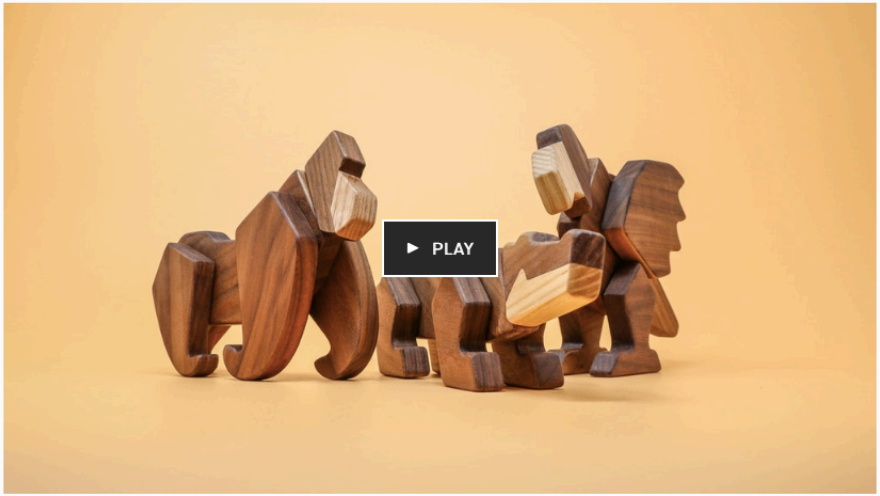
FableWood - 3 Magnetic Wooden Animals! Endless possibilities

By LetsGOrilla
First created

3 quality magnetic wooden animals you can assemble & reassemble to build anything you can imagine! For creative kids & playful adults!



Project We Love · Product Design · Copenhagen, Denmark

£21,605
pledged of £25,281 goal

224
backers

29
days to go

Back this project

Remind me

All or nothing. This project will only be funded if it reaches its goal by Fri, March 2 2018 11:00 PM UTC +00:00.

What do Wikipedia and Kickstarter have in common?

Galaxy Zoo is a **Zooniverse** project.

The Zooniverse is a collection of web-based Citizen Science projects that use the efforts and abilities of volunteers to help reseachers deal with the flood of data that confronts them.

Our Projects

We currently have dozens of **projects** on subjects ranging from astronomy, to climatology, to humanities.

username pass

Forgot Password?

CLASSIFY STORY SCIENCE GALAXY ZOO DISCUSS PROFILE

Few have witnessed what you're about to se

Experience a privileged glimpse of the distant universe as observed by the SDSS, CTIO and VST.

Classify Galaxies

To understand how galaxies formed we need your help to classify them according to their shapes. If you're quick, you may even be the first person to see the galaxies you're asked to classify.

Begin Classifying

How Do Galaxies Form?

History of Galaxy Zoo

Project Plumage

At a glance

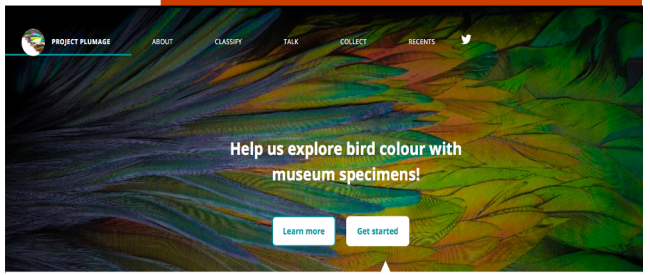
Mark up colourful Museum bird specimens

Type of activity: Online

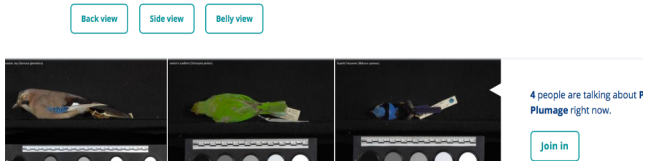
Who can take part? Everyone

When? Any time

How long will it take? Two minutes per bird



Explore and understand the diversity of feather colour in both the human visible and ultraviolet (UV) spectrum.



What are the main assumptions behind citizen science?

Answering the big science questions around climate change and the diversity of life requires lots of data, and our researchers can't gather this alone. You can help.

NHM London website

Citizen science is the involvement of the public in scientific research – whether community-driven research or global investigations. The Citizen Science Association unites expertise from educators, scientists, data managers, and others to power citizen science. Join us, and help speed innovation by sharing insights across disciplines.

CSA website

Citizen science

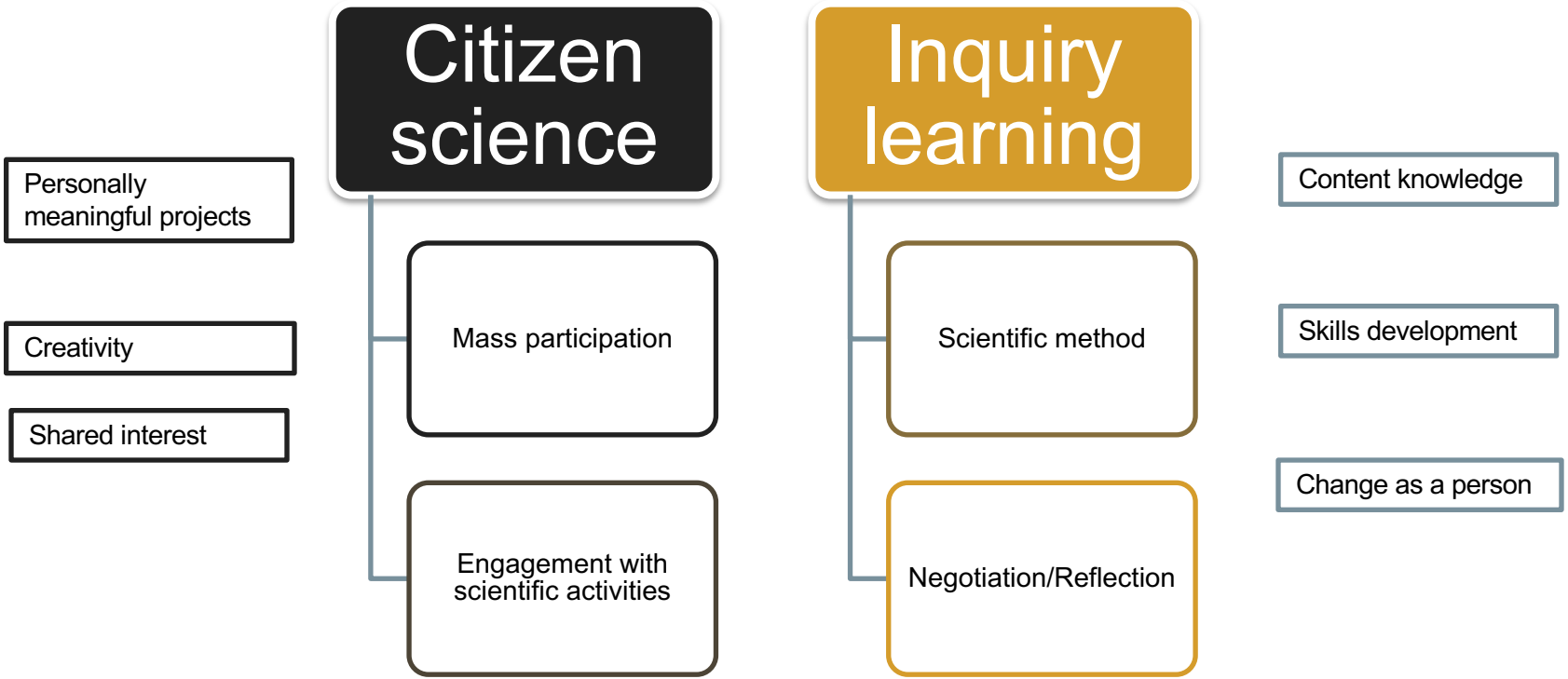
Encyclopedic entry. Citizen science is the practice of public participation and collaboration in scientific research to increase scientific knowledge. Through citizen science, people share and contribute to data monitoring and collection programs.

National Geographic website

Citizen science (**CS**; also known as **community science**, **crowd science**, **crowd-sourced science**, **civic science**, **volunteer monitoring**, or **online citizen science**) is scientific research conducted, in whole or in part, by amateur (or nonprofessional) scientists.[1] Citizen science is sometimes described as "public participation in scientific research," participatory monitoring, and participatory action research whose outcomes are often advancements in scientific research, as well as an increase in the public's understanding of science.[2][3] Based on Alexa rankings[4] iNaturalist is currently the most popular citizen science website[5] followed by eBird[6] and then Zooniverse[7] in second and third place respectively.[*needs update*]

Wikipedia, 13 Feb 2020

Citizen Inquiry



What is citizen inquiry?

Citizen science (participation of the public in research activities to collect or analyse huge data sets)

+

Inquiry learning (participation in the stages of scientific research; reflection; learning)

= Citizen Inquiry (learning through participation in citizen science activities)

Herodotou, Christothea; Sharples, Mike and Scanlon, Eileen (2017). Introducing citizen inquiry. In: Herodotou, Christothea; Sharples, Mike and Scanlon, Eileen eds. Citizen Inquiry: Synthesising Science and Inquiry Learning. Routledge.

1

INTRODUCING CITIZEN INQUIRY

Christothea Herodotou, Mike Sharples and Eileen Scanlon

The term 'citizen inquiry' was coined to describe ways that members of the public can learn by initiating or joining shared inquiry-led scientific investigations (Sharples et al., 2013). It merges learning through scientific investigation with mass collaborative participation exemplified in citizen science activities, altering the relationship most people have with research from being passive recipients to becoming actively engaged, and the relationship between scholarship and public understanding from dissemination towards cooperation. Through the presentation of empirical studies, this edited volume introduces concepts and practices of citizen inquiry.

In citizen science activities, members of the public (volunteers, non-expert individuals, amateurs) take part in research activities initiated by scientists, such as identification of invasive species, classification of natural history periodicals or identification of galaxies. The notion of public volunteering in the practices of science is central to citizen science. This is becoming a widespread method for conducting large-scale scientific research (Toerpe, 2013). The main reasons for the growth of citizen science include the availability of technical tools to analyse the large amounts of data collected and the realisation of the power behind this paradigm: involving the public can offer a freely available source of labour and skills that can overcome some financial and logistical constraints of doing large-scale science (Catlin-Groves, 2012; Silvertown, 2009). The Christmas Bird Count is a longstanding citizen science project, launched in 1900 and sustained by the observations of amateur birdwatchers (Havens & Henderson, 2013). Citizen science activities offer benefits to scientists and the participating public. Scientists generate large and long-term data series that would be labour-intensive and expensive to collect through traditional experiments. Members of the public have opportunities to educate themselves in scientific thinking and how science works, appreciate nature and contribute to science initiatives (Freitag & Pfeffer, 2013).

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"In this book, the notion of 'citizen inquiry' emphasises the ***active engagement*** *of the public in scientific activities that are not restricted to processes of data collection and analysis, and includes examples of citizen science projects initiated and implemented by volunteers. In citizen inquiry, the focus shifts from scientists to members of the general public as active agents who* ***define their own research agenda*** *underpinned by models of scientific inquiry, producing identifiable learning benefits."* *(Introduction chapter, Citizen Inquiry book)*

Scientific activities set by citizens

*“In this respect, citizen inquiry points to extensive use of online **social networks** and **mobile technologies**, with professional **scientists** joining not to instruct but to facilitate and support massive participation of the public of any age in collective, inquiry-based activities.”* *(Introduction chapter, Citizen Inquiry book)*

Scientific activities are scaffolded by technology, experts, and community members.

*“Citizen inquiry perceives science and scientific activities broadly, to encompass **both natural and physical sciences, and social and applied sciences** such as education, psychology, sociology, and medicine. One example of how the public could engage with scientific activities in the field of education is the provision of **personalised feedback to learners**. Teachers could propose and gather together alternative methods to solve problems and help learners in choosing a method that matches their understanding and ability, thus tailoring learning to individual needs (Heffernan et al., 2016).”* *(Introduction chapter, Citizen Inquiry book)*

Citizen Inquiry as an inquiry learning approach applicable across disciplines.

Poll 3

Have you heard of any of the following online citizen science platforms? (multiple select)

- iNaturalist
- nQuire
- Zooniverse
- SciStarter

nQuire

EXPLORE YOUR WORLD

nquire.org.uk

The Novels Survey: Identity

Rate our selection of novels and get personalised recommendations

Fact or Fake

Can you tell the difference between real and fake news stories?

Ended

Gardenwatch.

Bird Detective

What are garden birds getting up to?

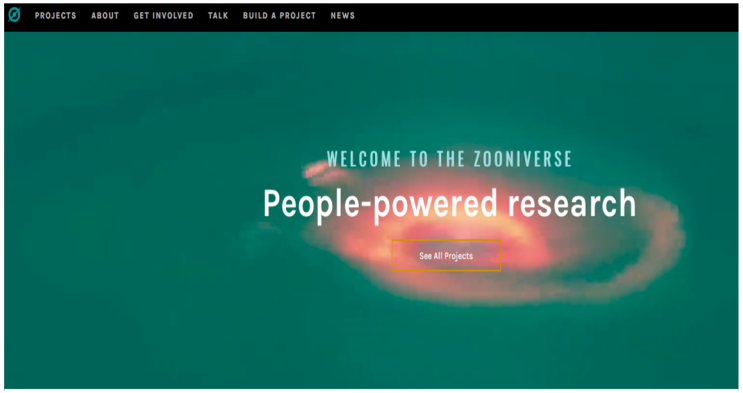
Noise map

How noisy is your classroom or workplace?

What is nQuire? (nquire.org.uk)

Online platform supports members of the public to engage in **large-scale scientific investigations**.

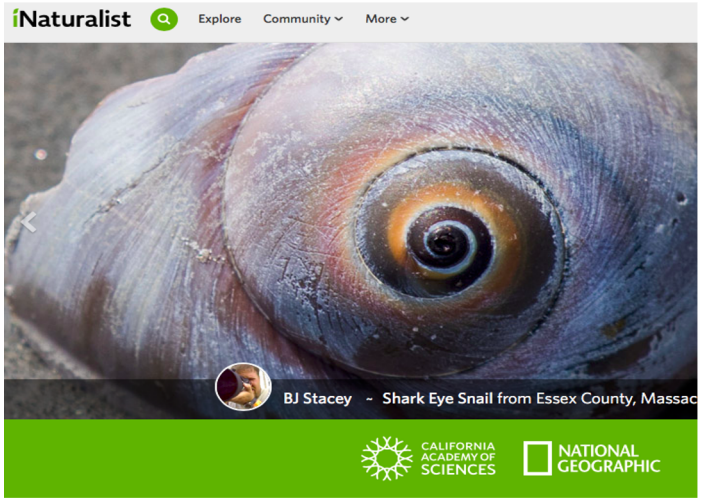
- scales up to thousands of users
- provides secure data storage
- supports research projects through anonymised downloads of data and built-in consent forms.
- **multi-faceted platform e.g. learning, research, teaching, citizen science.**



Vs

nQuire

EXPLORE YOUR WORLD



What is unique in nQuire?

- Explicitly designed to support inquiry learning processes
  - *Not just classifications or data analysis...*
- Pedagogically designed by educational experts
  - *Learning by doing; learning through inquiry; active learning*
- Flips the power from the scientists to the public
  - *Citizens at the centre of the activity*
- Promotes communications with experts and other citizens

The Open University

nQuire
EXPLORE YOUR WORLD

What is the vision behind nQuire?

Empower citizens through technology to learn how to act as scientists by

- taking part in missions set by others or
- setting up their own research agenda (personally or community relevant).

Educate citizens in thinking critically and scientifically through engagement with citizen science projects

- within and across disciplines.

Citizens: novice volunteers-------expert volunteers

Noise map

How noisy is your classroom or workplace?

Gardenwatch.

Bird Detective

What are garden birds getting up to?

nQuire

EXPLORE YOUR WORLD

"Missions": what types of investigations are hosted on the platform? (1/2)

Confidential missions are closed missions - data are not accessible by others but only the mission authors.

We will publish the overall results of each mission (anonymised) on the nQuire platform. We will never show or share your personal data.

Forest 404: This research was part of a collaborative project between the BBC, the University of Exeter, the University of Bristol, and The Open University.

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THIS MISSION INVOLVES RECORDING WHICH MAMMALS USE YOUR GARDEN, EITHER BY SEEING THEM OR LOOKING FOR SIGNS OF THEIR ACTIVITIES. YOU DON'T NEED ANY PREVIOUS EXPERIENCE OF MAMMALS TO TAKE PART.

WHY RECORD GARDEN MAMMALS?

Many different species of mammal will visit gardens and we'd like to understand the extent to which they do this. Monitoring how mammals use gardens can help us understand which resources are most important to their survival.

Hosted the Gardenwatch survey by BBC and BTO

nQuire
EXPLORE YOUR WORLD

KEY FINDINGS:

As many as **40% of gardens do not have a log pile**. This can can support a huge diversity of wildlife.

Only 30% of people are leaving grass to grow long, which is a very simple and easy measure to improve the wildlife value of gardens.

There is **an obvious bias towards providing boxes and food for birds** compared to other forms of wildlife.

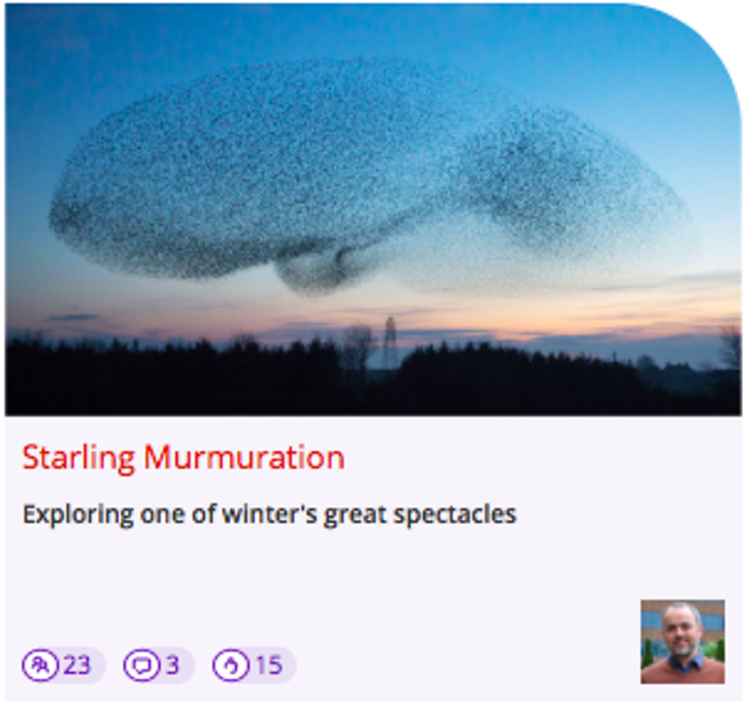
Hedgehog feeding and Hedgehog houses are in less than 20% of gardens. Hedgehog numbers are in severe decline.

200,000 users...

"Missions": what types of investigations are hosted on the platform? (2/2)

Social missions are open explorations of your world. You can see and discuss each contribution, and the data are available for anyone to view and download.

e.g. can you identify different types of cloud formations?



Live Demo of nQuire :

- Registration process
- Take part in a confidential
- Take part in a social mission

nquire.org.uk

AFRICAN COUNCIL for Distance Education

TESSA
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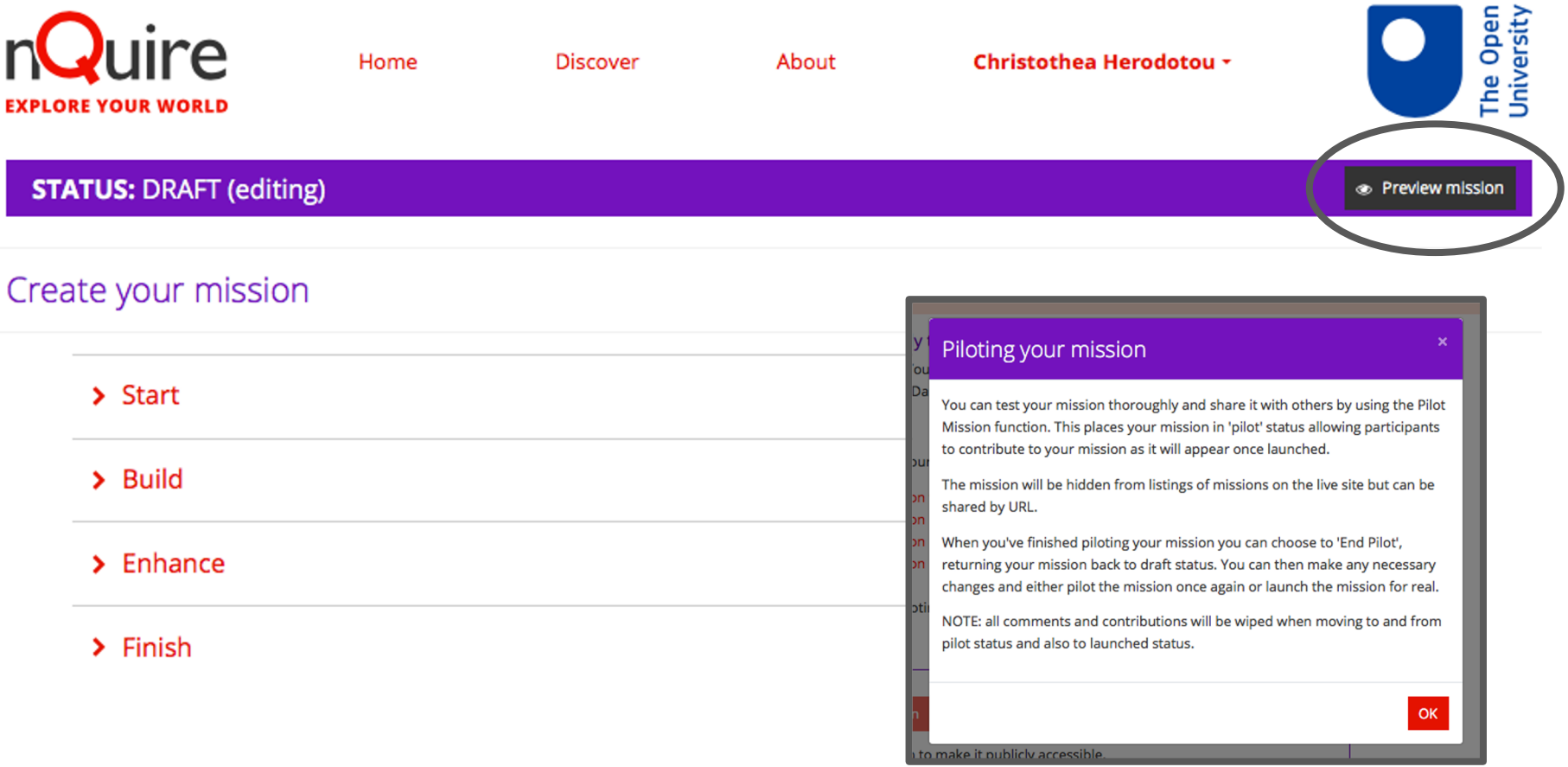
nQuire: Authoring a mission - DEMO



Build...

Range Slider change response type

Select scale:

7 Point | 10 Point | 11 Point

Remove Answer

Add labels for the low, medium and high position of the slider (all are optional):

Low position label | Medium position label | High position label

Response type

Images (single select) change response type

Image A:

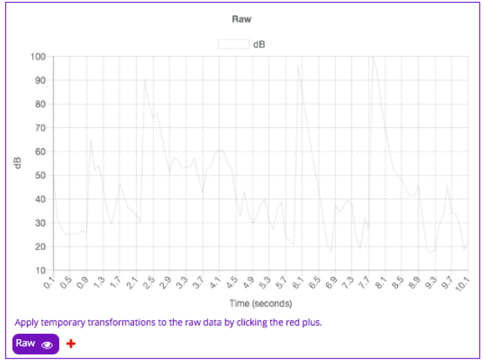
Upload
Drop Image 'A' here or click to upload
Enter a caption for your image

Image A caption

Image B:

Upload
Drop Image 'B' here or click to upload
Enter a caption for your image

Image B caption



Response type

Device Sensors change response type

Please select the sensors you wish to use.

Motion sensors:
- Accelerometer
- Gyroscope
- Linear acceleration
- Absolute orientation
- Relative orientation

Environmental sensors:
- Ambient light
- Magnetometer
- Audio volume (beta)

Services:
- Location tracker

Select a sensor from the list to find out more about what it does or to select it for your mission.

Please note, you may not be able to preview all the sensors listed due to the limitations of your device.

If you do not see any results when in preview mode, we recommend you flight check your mission on a different device such as an Android-compatible mobile phone.

Take a reading on the device: Once every second

nQuire: Monitoring content

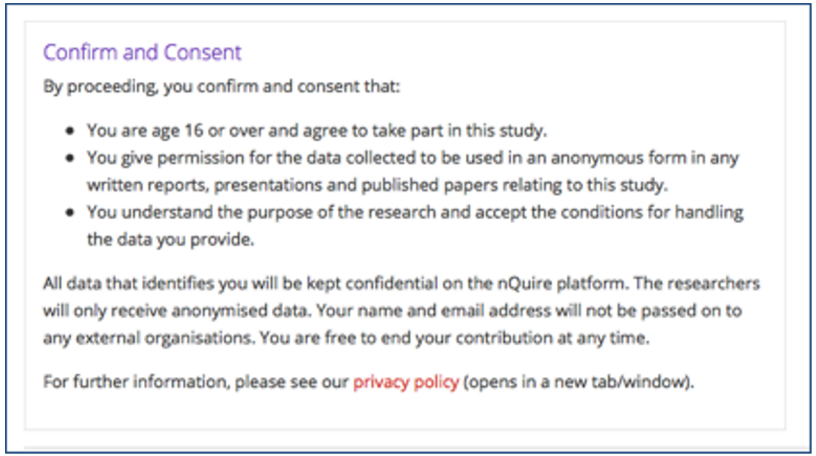
- Reactive moderation
  - Users can report content, which will then be moderated.
  - The email address for members of the public to raise issues of concern is nquire@open.ac.uk.
  - And can be found here: https://nquire.org.uk/contact
- Mission content (text, images etc) is monitored by the nQuire project team through a process of approval (See next slide)

nQuire: Ethical issues

A p**rocess of approval** is in place for reviewing and approving missions prior to going live:

- Mission inspection
- Mission language
- Content of consent
- OU ethical approval process

Customised consent form for each mission.



Confirm and Consent

By proceeding, you confirm and consent that:

- You are age 16 or over and agree to take part in this study.
- You give permission for the data collected to be used in an anonymous form in any written reports, presentations and published papers relating to this study.
- You understand the purpose of the research and accept the conditions for handling the data you provide.

All data that identifies you will be kept confidential on the nQuire platform. The researchers will only receive anonymised data. Your name and email address will not be passed on to any external organisations. You are free to end your contribution at any time.

For further information, please see our privacy policy (opens in a new tab/window).

Launch of social mission: Remote teaching in Africa

- Social mission - Peer learning activity
- Understand how nQuire works as a participant
- Share teaching experiences
- Learn from each other
- Get feedback from an Open University expert who will be commenting on some of the posts

Thank you!

Time to post your questions in the chat….

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christothea.herodotou@open.ac.uk