

Tomorrow's World nQuire: young people's requirements for engaging with inquiry-led, civic engagement technologies

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ABSTRACT

Citizen inquiry describes the learning benefits to people who engage actively in inquiry-led investigations. The Tomorrow's world nQuire project, a collaboration between The Open University and the BBC in the UK, utilises the citizen inquiry paradigm to design an online platform to support large-scale public experiments, linked to TV or radio programmes. Scaffolding the investigations has been a challenging task, exploiting technology affordances that integrate guidance for inquiry-led activities and mass collaborative participation. The aim of this study is to examine the usability of an early version of the platform and understand, in particular, how young people aged 16 to 18 in particular perceive technologies that support inquiry-led social science investigations. Outcomes revealed that there is a preference by the majority of the young participants to use mobile devices for accessing the platform. This finding emphasises the importance of mobilised learning and mobile-friendly design for engaging teenagers with inquiry-led activities.

Author keywords

Citizen inquiry, inquiry-led technology, mobilised learning, civic engagement

INTRODUCTION

Citizen inquiry forms a new approach to inquiry science learning, that exploits online social networks, mobile technologies and the knowledge of professional scientists to support public participation in inquiry-based activities (Herodotou, Sharples & Scanlon, 2017). The central idea of citizen inquiry is the engagement of the public in all the stages of an inquiry, enabling them to gain insight into the practices and challenges of inquiry, while researching something personally meaningful and contributing their knowledge. The Open University, UK, has developed the nQuire-it platform (<http://www.nquire-it.org/>) to explore citizen inquiry. The development of nQuire-it platform originated from the idea of having citizens act as scientists by enabling them to initiate, manage, share and complete inquiries related to their own interests (Herodotou, Villasclaras- Fernandez & Sharples, 2014). nQuire-it offers three types of inquiry (called missions), each of which uses a different method of data collection. Sense-it missions are connected to the Sense-it Android application (<https://goo.gl/K41vU6>) and collect sensor measurements. Spot-it missions make use of pictures that are uploaded to nQuire-it. Win-it missions have a research question that requires text as an answer. Each mission incorporates inquiry steps that the mission creator sets up to guide their co-investigators. Evidence from exploring the engagement of the nQuire-it users suggests that citizens might become more engaged when they are involved in personally meaningful inquiries (Aristeidou, Scanlon & Sharples, 2017).

The Tomorrow's world nQuire project is a collaboration between the BBC and The Open University (2017-2018), that aims to redevelop nQuire-it (now named nQuire) and host large-scale public experiments in social sciences such as psychology, linked to TV or radio programmes. This work will further develop and extend the existing functionality of the nQuire-it platform, integrating a new type of inquiry that supports surveys and quizzes for social science inquiries, and upgrading the functionality for hosting mass-participation experiments. This will allow citizens to create and contribute to online inquiries that explore aspects of social science. Scaffolding the creation of social science inquiries involves step-by-step guidance with a number of options for entering your questions, and aggregating the results. Contributing to the inquiries is reinforced by new ways to enter responses, secure handling of personal data, and receiving immediate feedback of the overview results.

The research objectives of this study are to examine the usability of one of the early versions of the new platform with young people aged 16 to 18, and understand whether this age group has specific design requirements for engaging with inquiry-led technologies. The version of the platform under examination has also been tested with adults and significantly enhanced and changed. Software applications (Newman et al., 2012) and Web 2.0 technologies (Catlin-Groves, 2012), such as citizen inquiry online platforms, might comprise the means to raise young people's interest in inquiry learning and encourage youth civic participation. This study is significant not only for the evaluation and improvement of the platform,

but also for embedding mobile citizen inquiry, in the everyday life and learning of citizens, supporting in this way their engagement with social matters and their social empowerment.

METHODS OF DATA COLLECTION

The software evaluation and partnership with young people took place in Leysin American School (LAS), in Switzerland, during the European Cooperation in Science and Technology (COST) workshop on enhancing synergies between citizen science and education. LAS is a boarding school with students coming from different backgrounds and having different native languages. The students decided and registered in a workshop of their choice, based on the circulated descriptions that informed about the study purposes. The Tomorrow's World nQuire study invited students 16+ only to take part, due to platform's age restrictions that align with the General Data Protection Regulation (GDPR). The students who joined our workshop (aged 16-18) consented to their participation on the online consent and confirmation form on the platform, prior to contributing or creating a mission.

Two groups were created and the workshop ran twice, at different times, for 30 minutes. The students were given the freedom to use the technology (mobile or desktop device) and the operating system (e.g., Android, iOS, Windows, macOS) of their choice. They were provided a link to the Beta version of the nQuire platform and presented with two scenarios (e.g., Figure 1). The first group (n=14) was asked to (a) contribute to an existing mission around nutrition and the second group (n=14) to (a) create a mission around the use of social media and, if there is some time left both groups to (b) complete the nutrition mission. The scenarios were prompting students to register with the platform and join/start the mission, without providing them with detailed instructions on how to navigate on the platform. Due to time constraints, the second group of students, beyond the scenario, they were also given the questions to use for the mission they would create.

Scenario 1 – joining an existing mission

Description:

You are interested in citizen science activities. You have been told about a new platform designed to support different types of citizen science projects. You visit the platform to find out more about it.

You are at the home page of the new platform (<https://approval.nquire.org.uk>) exploring what the platform can do.

You decide to join and complete one of the activities called 'nutrition (BETA for COST)'.
You **register with the platform** (2-3 minutes) **and complete the nutrition activity** (5-7 minutes).

Figure 1: Scenario 1 - Contributing to a citizen science inquiry

Activities in each group lasted for 20 minutes. A researcher (Author 1) was present, monitoring the activities, answering and recording any questions or problems they faced. Then, the students were asked to complete a survey regarding the technology they used, any difficulties they encountered, what they liked the most and the least, their feedback on the platform and their suggestions for future inquiry topics they would be interested in investigating. Students' activities (contributing to an inquiry or/and creating an inquiry) were recorded on the platform and reviewed by the authors. Students' survey responses have been subjected to either a content analysis, quantitative analysis of qualitative data (Morgan, 1993); or thematic analysis, examining themes within the qualitative data (Braun & Clarke, 2008). Content analysis was used for retrieving some statistics from responses to questions, such as whether they had any difficulties, while thematic analysis was used for grouping information regarding what they liked, did not like, and their suggestions. Based on students' feedback and suggestions, we aim to improve the design and functionality of the nQuire platform and design some of the proposed inquiries.

DATA ANALYSIS/EVIDENCE

Students' responses on what technology they preferred to use, reflect the familiarity they have with using mobile devices, as 26 out of the 28 students preferred to use their mobile devices for accessing the platform. The first activity – contributing to the Nutrition inquiry – numbered 26 participant registrations, with 24 out of 26 responding to the inquiry questions and 22 out of 26 completing all the questions in the inquiry. The second activity – creating an inquiry around the Use of Social Media – recorded seven inquiries (from seven students), but with only one adding details to the mission, such as a description and the inquiry questions to the mission. Participating students using mobile devices highlighted the fact that the mobile version of the software was not very usable when it comes to adding inquiry questions, as the text box was too small to let them read what they typed in.

In the survey, 16 students said they had no difficulties using the software, eight mentioned some difficulties and four skipped the question. The students who mentioned they had difficulties, focused mainly on the email verification for registering (e.g., speed of confirmation email, more than one request for email verification), finding and figuring out how to register, naming their inquiry, and drop-down list not responding. The analysis of students' generic feedback on the platform resulted in the following positive and negative themes: ease of use, pleasant visual presentation and colours, and originality (positive); and hard to navigate within the inquiries, mobile use (e.g., not perfectly optimised for mobile use, format could be better), mission creation (e.g., confusing to create a new mission), scope of the platform (e.g., not very obvious scope), and low speed (negative). Students' suggestions on how to improve the software and the inquiries included: more information and instructions, better mobile format, simpler registration, faster, new colour scheme, and search features. Students' proposed inquiries were not limited to suggestions around social science inquiries and they were grouped in the following categories: nutrition and health, use of social media, animals, astronomy, controversial topics, art, hobbies, politics and social matters. For example, they were interested in researching which food is healthy; to find out what people think about controversial topics; or to learn more about the wine. A student also added that they would like to research social issues, gather data and use them to make the world a better place.

RESEARCH OUTCOMES

Tomorrow's World nQuire can spark people's curiosity and interest in citizen inquiry, as well as to support them to set and answer their personally meaningful inquiries. The young participants of this study were very curious to explore the platform in general, the scenarios we gave them, and other missions available on the platform; they were also very keen to think of other possible uses of the platform for their own inquiries and suggest ways for better supporting them. The proposed inquiries can be a good fit for the platform, as they are all quite realistic and achievable. Furthermore, although this study took place at a school where students had access to their laptops and school desktops, the majority preferred to use their mobile devices for exploring the platform. This finding emphasises the need for user-friendly mobile design, and the necessity to design inquiry-led activities where mobile devices can be used, particularly when the activities aim to engage young people. Difficulties and suggestions mentioned by students including scaffolding (instructions), better colours and search features have already been communicated to designers and implemented in the latest version of the platform.

CONCLUSIONS AND FUTURE WORK

This work is significant for it examined the design and usability of inquiry-led technologies in particular for young people and stressed the importance of mobile affordances for accessing and encouraging use of citizen inquiry platforms. To engage young people with citizen inquiry, we need to identify and accommodate their needs, and this study showed that young people have distinct needs when it comes to engaging with technology. For young people, a significant factor for using inquiry-led technologies is mobile affordances as young people want to access technologies through their phones. This finding suggests that a way forward to engaging young people with inquiries may be the design of activities that can be accessed, or necessitate the use of mobile devices. Tomorrow's World nQuire can encourage people and particularly young citizens to participate in inquiries about social matters that affect their everyday life. The expansion of the platform that will take place in the following months will integrate the inquiry features of the existing nQuire-it platform, address limitations mentioned in this work, and incorporate young people's suggestions for improvements and ideas for inquiries.

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