An Ecosystem of Citizen Observatories for Environmental Monitoring

D3.4 WeObserve Distance Learning Programme II

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Glossary of terms

Term	Description
Co-creation	A project design approach that involves citizen scientists in the development of the research question, the identification of the problem to be addressed, and/or the development of a hypothesis where relevant. A co-creation approach includes citizens' input into the design of the tasks and the scope of the project as well (Bonney et al., 2009; Shirk et al. 2012)
Co-design	A research and professional solution-based methodology that supports inclusive problem solving. It places the citizen or stakeholder at the centre of a planned process of learning that focuses on the achievement of mutually agreed outcomes (Evans and Terrey, 2016).
Co-Evaluation	A methodology in which citizens involved in a project are actively involved in the evaluation of project activities, shortcomings and achievements.
Communities of Practice	'Groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.' (Wenger et al., 2002:4).
Cookbook	A term that refers to the WeObserve online resource containing a set of tried and tested "recipes", best practices, and instructions including barriers and strategies for Citizen Observatories. The Cookbook is in development at the time of writing.
Massive Open Online Courses (MOOCs)	MOOCs are free online courses available for anyone around the world to enrol and take. MOOCs provide an affordable and flexible way to learn new skills, advance a career and deliver quality educational experiences at scale.
FutureLearn	Leading online education platform for Massive Open Online Courses with worldwide reach. FutureLearn is a commercial subsidiary of The Open University.
Indicator	A measure for which data are available to quantify outputs or outcomes (also referred to as a metric).
Open Access	Open access is a set of principles and a range of practices through which research outputs are distributed online, free of cost or other access barriers. To reduce barriers for uptake it is usual for rights and access to be explicitly defined through open licences.
Toolkit	Widely understood as a collection of tools and methods which help facilitate the execution of activities towards a specific purpose. For citizen observatories, toolkits support and improve

	best practices, encompass a range of methods for collective inquiry, and provide digital and analogue tools which can facilitate a participatory approach in environmental monitoring.
Tools	Implements that vary in form (paper based, digital and online) and support participation in citizen science and citizen observatory activity.

Abbreviations and acronyms

Abbreviation	Description
CLI	Community Level Indicator
CO	Citizen Observatory
CoP	Community of Practice
CS	Citizen Science
FL	FutureLearn
GEOSS	Global Earth Observation System of Systems
GT2.0	Ground Truth 2.0
GROW	The GROW Observatory
MOOC	Massive Open Online Course
SDGs	Sustainable Development Goals

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Executive Summary

WeObserve has developed a distance learning programme to facilitate the scaling of citizen observation whilst addressing diverse and inclusive participation. The field of citizen science is deservedly well recognised for engaging people and achieving scale for participation in scientific inquiry. However, whilst programmes can support high numbers of data contributions from citizens, it is more difficult to achieve scale where highly collaborative or longitudinal participation is required, typified through the co-design approach frequently adopted in COs. By sharing tried and tested methods and best practices, providing both tools and knowledge we aim to dramatically spread and scale training and support for citizens and communities. The programme has also aimed to connect local environmental issues with global challenges and objectives, such as the Sustainable Development Goals (SDGs), providing the means for citizens to better understand how to map and share observations and progress. WeObserve has built on the success of a recent Citizens' Observatory (CO), the GROW Observatory's use of Massive Open Online Courses (MOOCs) (Hemment et al., 2018a and 2018b), to reach and train thousands of people across the world without compromising the scientific robustness of protocols and content.

The WeObserve MOOC "Citizen Science Projects: How to Make a Difference" is a four week course that delivers a targeted learning journey in the area of environmental and citizen sensing. The first iteration of the course ran in November 2019. A second iteration will run in autumn 2020, and there are plans to keep the course material available beyond the end of the funded project. The MOOC is a vehicle for training and shared learning that results in an active online community, contributing powerful learning, dissemination and capacity building dimensions to the CO ecosystem. Led by Work Package 3 '*Accelerate*'[1] and planned and implemented within Task 3.2 '*Deliver the WeObserve Citizen Observatories distance learning programme*', the MOOC ecosystem of people and knowledge supports the WeObserve project in accelerating and stimulating the uptake of the CO knowledge base.

This report builds on WP3 Deliverable 3.2 '*WeObserve Distance Learning Programme I*' (submitted in Month 23), an internal project report which outlines the research and development of the first MOOC. This report, Deliverable 3.4 '*WeObserve Distance Learning Programme II*' provides an evaluation of the first iteration of the course, insights gained, and a detailed plan for updating the content for the second iteration to include the latest tools developed by the Consortium to promote their uptake and dissemination. It makes several contributions to the field as it builds on existing research into the use of MOOCs and analyses delivery of a course to present strengths and weaknesses that others may learn from. Furthermore, it outlines a proposal for advancing MOOCs as an engagement and training tool in CS and COs.

[1] WP 3 full title, *Accelerate: Stimulate uptake of the citizen observatories knowledge base.*

1 Introduction

The rising trend in citizen science has led to the development of Citizen Observatories (COs) for environmental monitoring. COs have been supported by the European Commission in several research and innovation programmes. The WeObserve (WeObserve) project improves coordination between existing COs and related regional, European and international activities. This support action delivers tasks, activities and a series of events to raise awareness, improve acceptability and ensure sustainability of COs across Europe and beyond. This global ambition requires novel approaches to conventional citizen science projects for both the recruitment and training of participants. This deliverable documents the Distance Learning Programme developed and delivered by WeObserve, designed to scale up reach and uptake of tried and tested CO approaches, tools and data.

1.1 Background

MOOCs combine traditional educational materials and an online community of global learners to deliver a targeted learning journey, characteristics key to the international reach COs aim for. One of the critical challenges facing COs are scaling and spreading of best practices of citizen sensing and earth observation (Moorthy et al., 2018), and this is where MOOCs can offer a solution at a global scale. While MOOCs are not a panacea and cannot and should not replace face to face interaction and classroom learning, they have broad reach and significantly lower the barriers for acquiring learning. Additionally, MOOCs also offer a vehicle to enable a level of digital social interaction, bringing together those new to the field with more experienced learners in a way that cannot be supported otherwise. With recent global developments and the Covid-19 pandemic, this way of engaging with citizens and building communities is increasingly important.

In the case of WeObserve, a MOOC was designed to create a targeted learning journey and build an online community of learners and practitioners in the area of environmental and citizen sensing. One of the key benefits of delivering learning through a MOOC is that it has unlimited participation, and is designed to be open access via web-based platforms to people all over the world. Following the success of the GROW Observatory's[2] integration of MOOCs in its approach, insights revealed that there was an opportunity to move beyond pure education, to address additional needs such as recruitment, training of participants and awareness raising around a wide range of CO-related topics (Drew et al., 2018a and 2018b). WeObserve is building on this work to amplify the work of the four CO members of the WeObserve consortium as well as other citizen science projects.

WeObserve has used an existing and established platform, FutureLearn (FL), in order to promote social and peer-to-peer learning and deliver a positive and engaging experience to potential learners through a tried-and-tested framework for delivery. FL, which will continue to run the course far beyond the WeObserve funded period, has a highly scalable platform that is capable of sustaining more than 100,000 learners at one time. A core component of FL is the ability to promote shared learning by initiating conversations, and through the exchange of knowledge and experiences. In particular, the WeObserve MOOC course brought learners together to form an international community around a common interest in

[2] The GROW Observatory is one of the main COs involved in WeObserve.

environmental monitoring. Together, this promotes the building of a community of learners thus creating an ideal benefit for the objectives of WP3 regarding the acceleration of the uptake of COs' resources and activities.

This deliverable continues WP3's efforts to support the WeObserve Consortium in accelerating and stimulating the uptake of the CO knowledge base. This includes the close links with the ongoing work on the WeObserve Learning Programme and Toolkits, recently reported on in:

- Deliverable 3.1 *WeObserve toolkits for building champion communities I* (Coulson, S. et al., 2018).
- Deliverable 3.2 *WeObserve distance learning programme I* (Coulson, S. et al., 2019).
- Deliverable 3.3 *WeObserve Toolkits for Building Champion Communities II* (Ajates and Woods, 2020).
- Deliverable 2.8 *WeObserve Cookbook: Guidelines for creating successful and sustainable Citizens Observatories* (WeObserve consortium, forthcoming - now) WP2's WeObserve Cookbook is now scheduled for publication in spring 2021).

This document provides an evaluation and update on the delivery of the first iteration of the WeObserve MOOC in 2019, building on the internal Deliverable 3.2 '*WeObserve Distance Learning Programme I*' that was submitted in Month 23; both of these reports are undertaken within Work Package 3's Task 3.2 '*Deliver the WeObserve Citizen Observatories distance learning programme*'. Deliverable 3.2 presented the research, both internal and external to the Consortium that underpinned the development of the online course, mainly:

- An overview of the research development and activities that informed the overarching learning pathway for course structure.
- An overview of the course content, and contributions from COs.
- An account of the process of collaborative working amongst the WeObserve partners for multimedia content development led by WP3.
- A detailed description of the approaches for the development and promotion of the course trailer (accessible through this link: https://www.youtube.com/watch?v=s4FhlGui_7M).

1.2 Purpose and scope of the report

The purpose of this report is to provide an evaluation of the first iteration of the WeObserve MOOC that ran in November 2019, taking stock of insights gained with the following objectives:

- Reflect on enrolment and participation statistics both in general terms and in context of MOOC practice, as well as looking at week and course step level activity to identify strengths and areas for improvement in the content and structure of the course.
- Build on and contribute to the novel body of knowledge around using MOOCs in COs to scale up awareness of citizen science activities and in particular of European COs.
- Validate our approach to updating the content for the second iteration of the course to run in autumn 2020.

- Review WeObserve's achievements since the course run, and present a strategy for future iterations that incorporates the latest developments, such as WeObserve toolkit components and the inclusion of these to increase uptake and dissemination.
- Consider sustainability options for future-proofing the usability of the course content, following two main strategies: 1) links with other projects (e.g. EU Citizen Science) and 2) future delivery beyond the end of the funded project with a 'light touch' and no moderation.

These objectives form the structure and sections of this deliverable and are expanded on further in each section.

1.3 Methodology

Our evaluation of the learning programme uses both qualitative and quantitative approaches. We first look at the following MOOC statistics for the first run:

- Enrollment, progress and completion numbers
- Activity statistics per course week (i.e. visitors' funnel) and, number of visits per individual steps.
- Number of participants' comments as a metric of learner engagement.
- Geographical reach, looking at the number of countries with at least one learner taking part on the course).

We then briefly discuss both the theoretical dimensions of social learning and the pedagogical implications of having to balance the needs of learners from a wide range of cultural backgrounds and academic expertise. We present insights from course metrics and learners' comments, and how these are being used to inform the content revision process for the next iteration. A separate section discusses the rationale for the inclusion of study groups in the course and their performance, followed by reflections on the iInternational reach of the MOOC and recommendations on replicability beyond Europe for more widespread CO uptake.

Finally, we share the current strategies being implemented to foster the sustainability and promotion of MOOC content and community.

2 Statistics and Insights: WeObserve's MOOC Iteration I

The first iteration of the WeObserve's MOOC "Citizen Science Projects: How to Make a Difference" ran on the FutureLearn platform for four weeks from 18th November to 15th December 2019 (https://www.futurelearn.com/courses/weobserve-the-earth).

In this section, we present an overview of the topics covered and a range of statistics on enrolment numbers and participation.

2.1 Course content

The WeObserve MOOC brought together the wide range of expertise in the consortium from the domains of social and computer sciences, design and citizen science, applied systems, and more. The transdisciplinary knowledge was beneficial in creating a set of materials that represented the activities and themes of all COs involved in a comprehensive and well articulated manner.

The Learning Objectives that we defined and designed for participants who complete the course were to:

- Investigate what citizen science and citizen observatories are.
- Explore what projects are available, what they do, and how to get involved.
- Engage with the general process of a citizen science project, the tools used, and where to find them.
- Model the steps to create your own citizen science project.
- Collect and analyse data on environmental issues such as air pollution, water quality, soil quality, and land use, and discuss the results of your findings.
- Evaluate the potential of citizen science in bringing about change.

In order to achieve this, the course was structured across four weeks, and took learners on a guided learning journey on four key themes:

- Week 1: Getting started with Citizen Observatories
- Week 2: Collecting and measuring data
- Week 3: Analysing and visualising your data
- Week 4: Sharing results and creating change

Figure 1 below shows the weekly dashboard structure that learners see on the FutureLearn platform, with an intuitive overview of the list of steps and the format (e.g. video, article, etc) that need to be completed each week.

Participants taking part on the WeObserve MOOC were able to learn about how to lead a citizen science project, including the best practices for community building, question forming and data collecting as well as how to interpret the data collected and use findings to educate others about environmental concerns and create positive change.

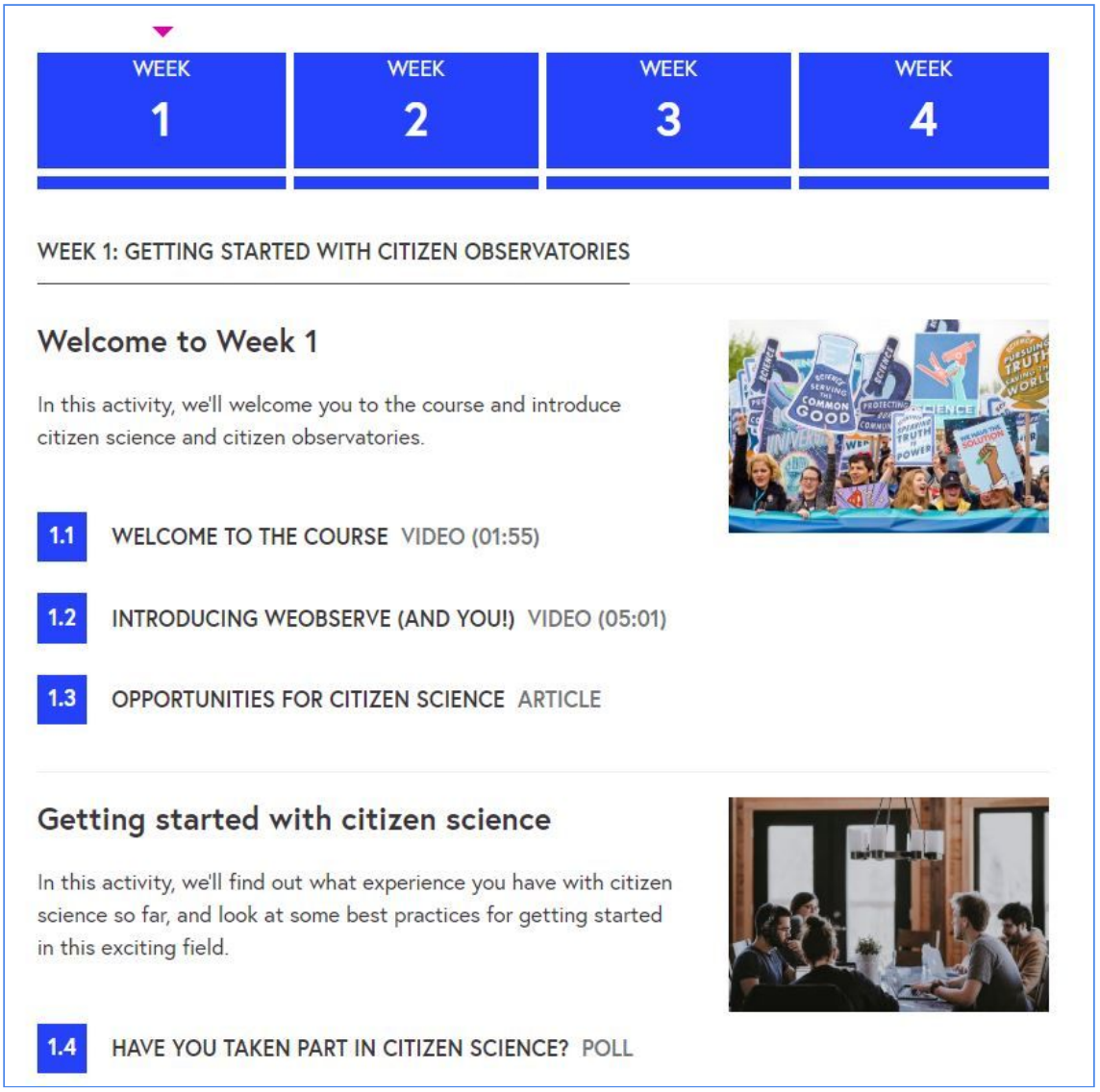

FIGURE 1: SCREEN CAPTURE OF MOOC TO DO DASHBOARD ON FUTURELEARN

The topics covered over the four weeks of the course included:

- Understanding the issue or problem: exploring environmental issues and deciding on a research focus.
- Creating a community: finding the people who are brought together by a shared concern and positively nurturing the sharing of ideas and experiences.
- Deciding what data to collect: using the research question(s) to select what information will be gathered.
- Capturing or generating the data: collecting the information, keeping motivated and engaged.
- Analysing the data: interpreting the data, being able to spot trends and anomalies.
- Disseminating results: using the findings from the data to communicate with others about the environmental concern.
- Change-making / planning action: using the findings to lobby for change, or plan an intervention or action to inform others about the environmental concern.

Each week was divided into approximately 3-5 sections referred to as "activities" in the FutureLearn platform. Each activity in turn, has an average of 4-7 steps. Each step can take a different format: a video, a poll, an article, a quiz, etc. Each step also includes a discussion forum in which learners can share questions, thoughts, links and other resources. All learners have the ability to see and comment on each others' posts, which enables connections and learner-led discussions.

In the case of the WeObserve MOOC, the course ran for 4 weeks, each composed of a balanced variety of steps (see Table 1 below for a breakdown), each week finishing with a quiz to enable learners to test and consolidate their knowledge. In total, there were 25,144 step visits on the first run of the course.

TABLE 1: BREAKDOWN OF STEPS IN THE WEOBSERVE MOOC

	Total n. steps	**Steps breakdown**				
Weeks		**Article**	**Video**	**Poll**	**Discussion**	**Quiz**
W1	18	8	6	1	2	1
W2	16	6	6	0	3	1
W3	13	6	4	0	2	1
W4	13	4	6	0	2	1
Total	**60**	**24**	**22**	**1**	**9**	**4**

As FutureLearn courses are open to learners of all educational backgrounds, the course cohorts are very diverse. Therefore the entry point and complexity of the materials have to take into account the varied degrees of education (both general and specific) that learners bring to the course. For this reason, the course content was designed to be accessible to discerning but non-experts learners, and at the same time, interesting enough for more experienced participants. Based on andragogy (adult learning theory) recommendations, a combination of additional resources and questions encouraging more knowledgeable learners to share and build on their experiences was used to keep mature voluntary students engaged and able to learn regardless of prior knowledge on the topic (Chametzky, 2014).

Further details about the MOOC can be found on the FutureLearn dedicated course page: https://www.futurelearn.com/courses/weobserve-the-earth.

2.2 Enrolment and participation statistics

The growth of e-learning continues to expand year on year, with MOOC platforms reporting millions of enrolments every month (Yang et al., 2017). However, up to 90% of participants stop their engagement with online learning after their initial MOOC experience (Hew and Cheung, 2014); drop-out/non-completion rates are substantially higher than in more traditional education, with some authors reporting them to be less than 10% of registered students completing the course, and others between 10 and 20% (Clow, 2013).

Aware of this participation pattern, the WeObserve team designed the course in the style of connectivist MOOCs (Clow, 2013), fostering peer to peer learning and creating content that has applicability potential. Additionally, the MOOC was promoted widely to reach a larger number of participants.

One of the benefits of delivering online courses through the FutureLearn platform is the detailed breakdown of course metrics that educators can extract about their courses; from the effectiveness of marketing campaigns, to course completion rates, as well as number and content of learners' comments. A particular metric highly relevant to this deliverable is data on the geographical location of learners which will be discussed in more detail later on in this section.

973 joiners based in 107 different countries signed up for this course. An overview of all enrollment statistics can be seen in Table 2 below, covering the first iteration of the course that started on 18th November 2019 and lasted for four weeks. A description of each learner category and how statistics are collected by FutureLearn can be found in Appendix 1. Appendix 2 presents comparative enrolment figures for other FutureLearn courses in the same subject categories as the WeObserve MOOC, namely a) Science and environment and b) Science, engineering and maths. The WeObserve MOOC overall performed within the expected averages for both categories.

TABLE 2: MOOC ENROLMENT STATISTICS OVERVIEW[3]

Metric	Number for Iteration I (Nov 2019)
Joiners	973
Leavers	50
Learners	607
Active Learners	359
Social Learners	139
Learners with ≥50% step completion	104
Learners with ≥90% step completion	83

Joiners include all learners as well as course educators and administrators. Learners are users (of any role) who have viewed at least one step, at any time, in any course week. This includes those who go on to become Leavers. Active Learners are those (of any role) who have completed at least one step at any time in any course week, including those who go on to become Leavers. Social learners are users on the course (of any role) who have posted at least one comment on any step. A description of each category can be found in Appendix 1.

Table 3 provides a more detailed breakdown of participation per course week, including the number of completed steps and average per learner, as well as numbers of comments posted per week and average number of comments per user. 1,201 comments were posted in total during the course.

[3] Accurate up to midnight on 9 February 2020 UTC

Table 3: MOOC enrolment statistics Overview per week[4]

Week	1	2	3	4
Learners visiting steps	591	167	136	123
Active learners	357	132	104	94
Social learners	128	49	30	24
Visited Steps	4,864	2,068	1,414	1,316
Average visited steps per user	8.23	12.38	10.4	10.7
Completed steps	3,690	1,768	1,209	1,120
Average completed steps per user	10.34	13.39	11.63	11.91
Comments	692	277	126	106
Average comments per user	5	5	4	4

Figure 2 shows the number (and corresponding percentage) of learners who visited each step. The orange bars illustrate the number of learners per step; the purple line indicates the number of learners who visited and ticked a given step as completed; the orange line provides data on the percentage of learners who posted a comment on each step.

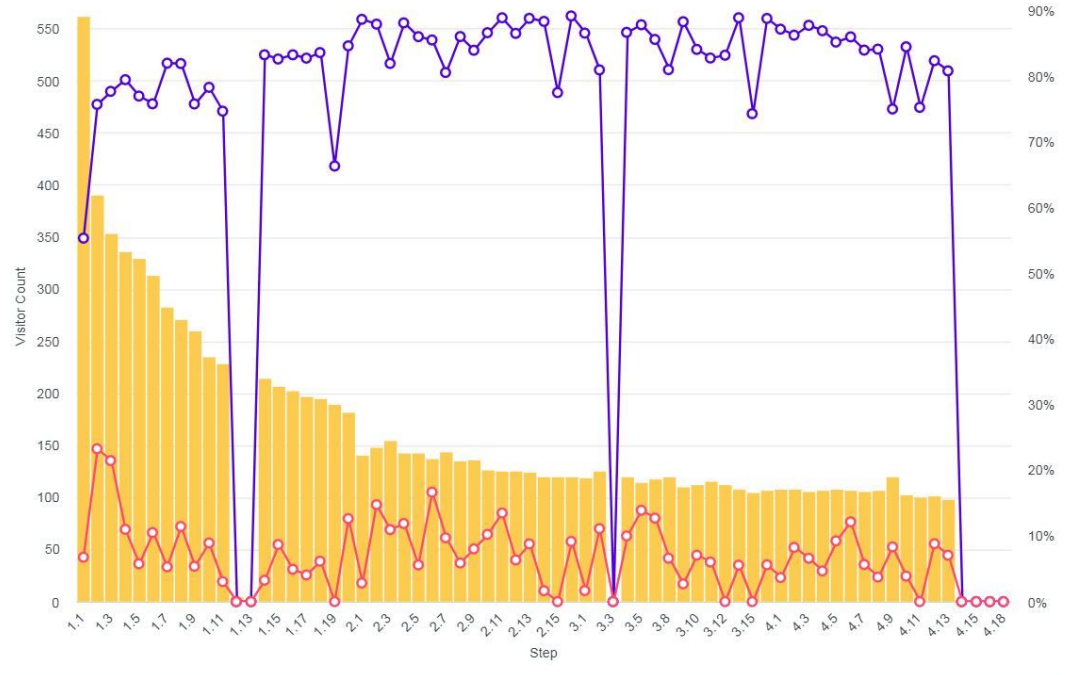

Figure 2: Learners who visited each step

For example, in Step 1.2 (second step in Week 1 of the course), there were 391 visitors, of which 76% ticked the step as completed, and 23% of them posted a comment. While the number of learners per step decreased during Week 1, a standard pattern in MOOCs, this

[4] Accurate up to midnight on 9 February 2020 UTC

metric remained fairly consistent over the other three weeks of the course (demonstrated by the orange bars); additionally, learners who continued with the course had a relatively equal rate of engagement in the steps (demonstrated by the purple line), which shows a smaller but still dedicated group of learners.

Figure 3 below shows the distribution of visitors per week, with the corresponding percentages. The number of visitors remained consistent after Week 1. As expected from MOOC participation patterns, the number of video views and comments indicates how the level of participation went down as the course progressed.

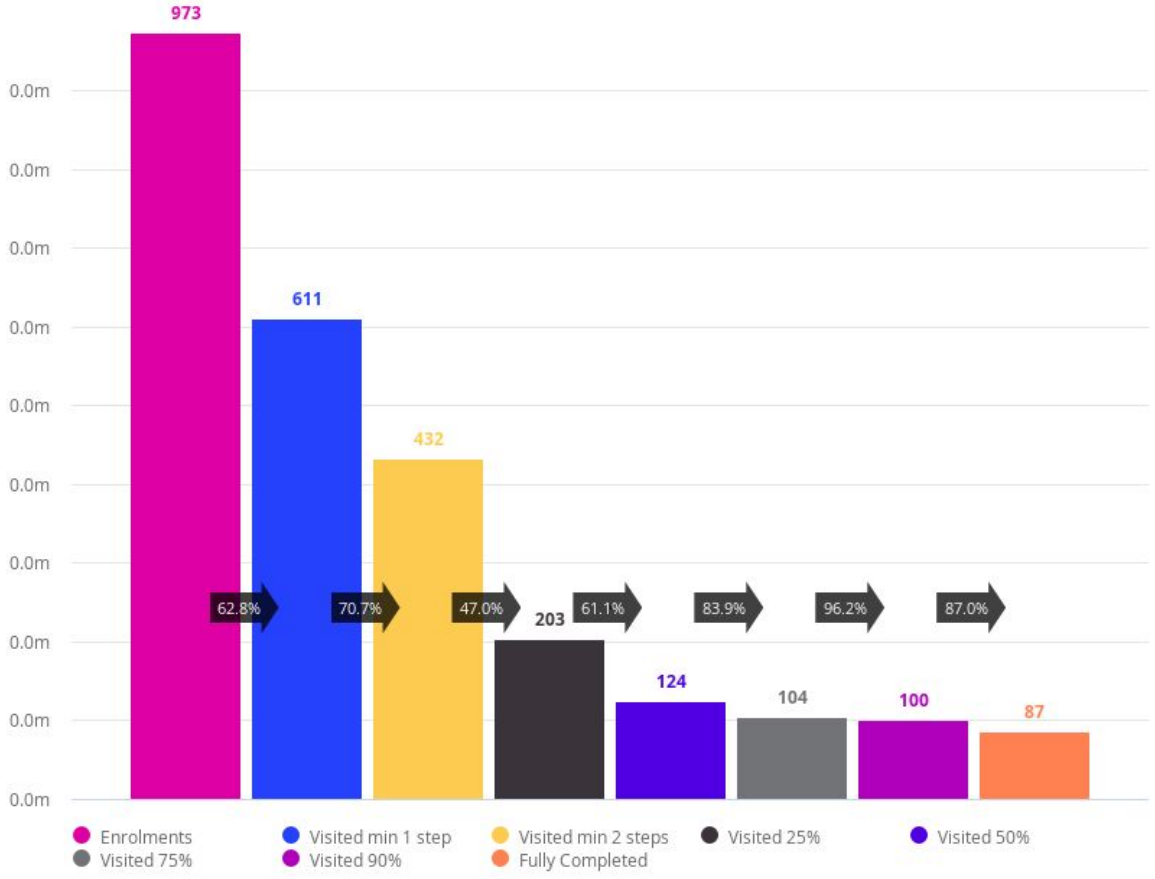

FIGURE 3: VISITORS FUNNEL

The three graphs below (Figure 4, 5 and 6) show the distribution of respondents who completed the FutureLearn demographic survey across the following parameters: age group (110 respondents), employment status (113 respondents) and gender (117 respondents). While that number of respondents is low compared to the total number of joiners (973), is a good percentage for a survey response rate, particularly if we take the number of learners (users who have at least viewed at least one step, at any time, in any course week), i.e. 607, as the baseline of the most engaged group of MOOC participants. Of the 973 joiners, 815 were new learners who had never taken a UoD led MOOC before.

Age wise, the MOOC managed to attract younger people than the average CS participant (Hecker et al., 2018). Regarding gender, we see a balanced distribution, which can also be seen as an achievement as the CS community has reported skewed levels of participation with higher numbers of older males taking part (Hecker et al. 2018).

About 60% of learners who completed the survey were either in full time, part time employment or full time studies, which might indicate the lack of time to complete the course.

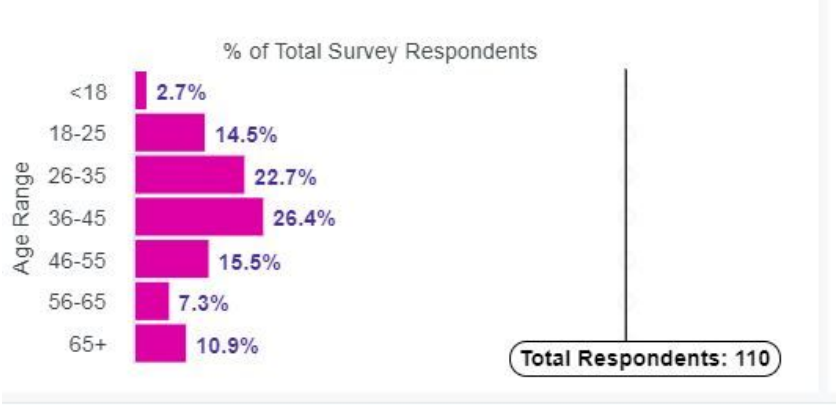

FIGURE 3: ENROLMENTS BY AGE GROUP

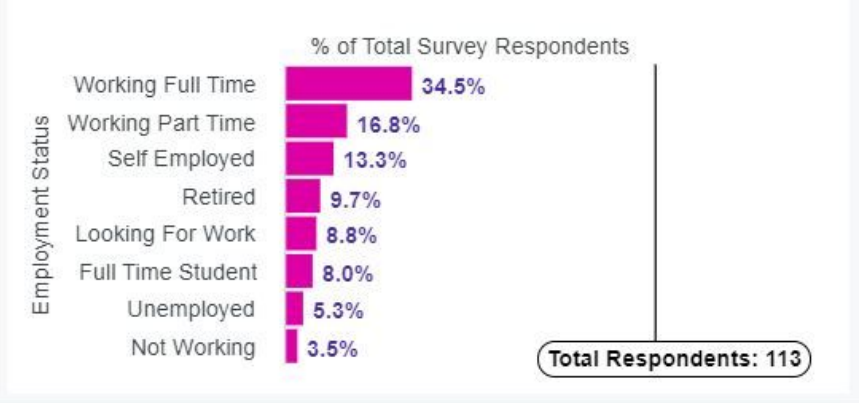

FIGURE 4: ENROLMENTS BY EMPLOYMENT STATUS

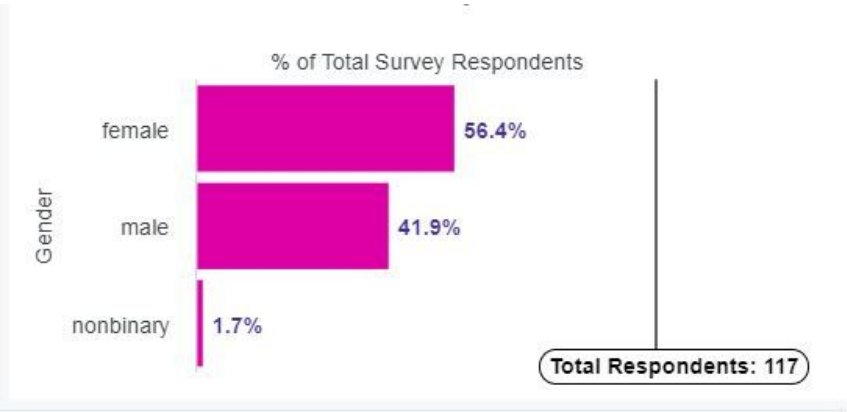

FIGURE 5: ENROLMENTS BY GENDER

The map of the world in Figure 6 shows the distribution of MOOC participants per country. A darker shade of blue, illustrates a location with a higher density of joiners. The figures on the map indicate the number of joiners per location (not learners). The United Kingdom accounted for the highest percentage of joiners at 23%. The graph in Figure 7 provides a list of the most represented countries, with breakdown of percentage per each. The full list of countries represented has been included in Appendix 3.

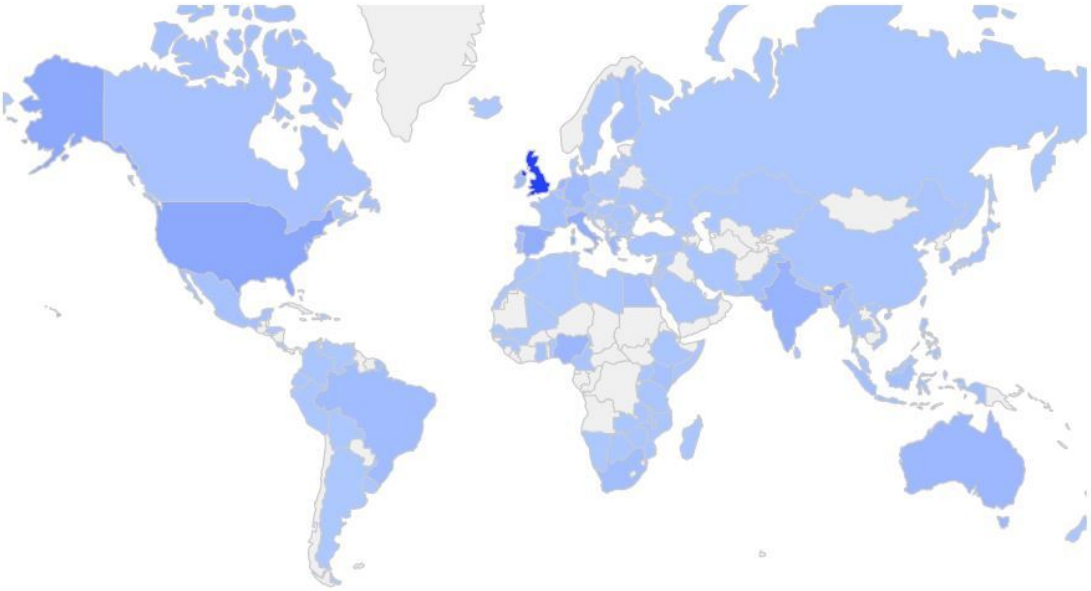

FIGURE 6: MAP OF ENROLMENT DISTRIBUTION BY COUNTRY

Enrolments by country

		Average
United Kingdom	23%	25%
United States of America	5%	4%
Italy	5%	2%
Spain	5%	2%
India	4%	6%
Nigeria	3%	3%
Netherlands	3%	1%
Australia	3%	3%
Greece	3%	1%
Germany	2%	1%

FIGURE 7: ENROLMENT PERCENTAGE BY COUNTRY

At the end of MOOCs, FutureLearn runs a short satisfaction survey with fixed questions. Below, Figure 8 shows the responses of the 34 learners who completed this exit survey. 88% of respondents felt the course had either met or exceeded their expectations. 94% of learners reported having gained new knowledge or skills thanks to the course.

FIGURE 8: EXIT SURVEY RESPONSES

3 Evaluation of course design and content

An evaluation of course statistics combined with a review of feedback from learners' comments on the platform while the course was running,[5] has generated insights that will inform the revision of the course content for the next run.

3.1 Insights from course metrics and learners' comments

FutureLearn runs an exit survey to help find out the reason/s learners report for leaving the course without completing. From the people who left the course, (50 out of 973 learners) only 26 completed the leaving survey; out of those, 6 mentioned lack of time as their reason for exiting the course; this is not a representative sample of learners, but it could be an indication of why others did not complete the course. 6 learners reported other not specified reasons, 8 reported their access to the content had expired. 5 leavers felt the course was not what they expected, and finally 1 person felt the course was not going to help him/her reach their goals.

As mentioned in the previous section, the number of comments decreased significantly as the course went on. This is a normal trend as most comments are posted during the first week, especially in the introductory steps where learners are encouraged to share their names, background and motivation to join the course. In terms of video views, the number of views is also significantly lower in weeks 3 and 4. In the following sections, we present further empirical information and discuss how these insights will be used to inform the standard process of revising course content for the next iteration of the MOOC.

[5] Due to GDPR, this report cannot include any direct quotations of comments or feedback from the Learners who engaged in the course.

3.2 Insight: Study Groups

Study Groups are a new offering on the FutureLearn platform. This feature allows learners to join a separate discussion board from the MOOC steps where they can share messages or hold a discussion on the wider subject matter, and is not limited to the specific step content. Learners are assigned to the Study Groups at random and can leave and join another group, albeit this would also be assigned at random. Educators can participate in these discussions too, and the Lead Educator has the ability to 'broadcast' or share a single message across all the Study Group discussion boards.

The Study Group feature was incorporated in the first WeObserve MOOC with the intention that it could replicate the face-to-face meet ups which many CS projects and COs often deliver. This attempt was premised on the knowledge that a lack of social interactions has often led to participant detachment in remote environmental monitoring activities (Balestrini et *al*., 2015). Study Groups offered a space within the FutureLearn platform that could be seen as a social and convivial space for learners and educators to engage in discussions about CS. Another reason for incorporating Study Groups into the WeObserve MOOC was to introduce some of the co-creation tools that have been tried and tested in COs aligned with WeObserve, and to examine whether these tools could be applicable to groups working remotely. Every week a new tool would be incorporated into the course and would relate to the theme of the week and the information that was presented in the step activities.

At the start of the course, four Study Groups were set up and groups were asked to select an environmental issue of their choice and use that as the basis for which they would consider and undertake the following activities:

- **Week 1: Empathy Timeline** - using a 24-hour time line the groups were asked to map out the ways they were affected by the environmental issue at hand, and the way they contribute to it. A link to a Padlet Board[6] was provided to give the Study Groups an online space to map out ideas (without the restrictions of a linear discussion forum).
- **Week 2: Co-Design a Data Collection Plan** - Study Groups were asked to discuss and plan how they would collect the data they would need for their issue. This activity was done through the Study Group discussion forum.
- **Week 3: Data Visualisation** - A link to another Padlet Board was provided to each group where they could share examples of data visualisations that related to their issue.
- **Week 4: Future Newspaper** - This activity was designed for the groups to think about a headline for a Newspaper in the future, something they would like to see that would be a positive outcome on their issue. The groups were then asked to give detail as to how this headline could be achieved, having them think about the steps needed to resolve challenges. A Padlet Board was provided to each group for this work.

Each of the weekly activities would relate to a Step, usually an article or video in the MOOC, on the course content pages that would explain the tool and how it had been used in a previous CS or CO project.

[6] Padlet is an online collaboration tool that allows users to pin photos, websites and other information in a variety of layouts, similar to an online white board. For more information: https://en-gb.padlet.com/

Active Learners demonstrated interest and engaged with the Study Groups in course immediately after its launch. The initial challenge was for the groups to decide on an environmental challenge. As many Learners had come to the course with a wider variety of concerns and experiences in taking part in CS initiatives many of them had their own suggestions. One group took a vote to decide on their environmental challenge using an online polling platform. All groups demonstrated respect and interest in this discussion. However, some Learners would leave a Study Group if they were not interested in the environmental challenge that was agreed upon. The ability to change one's' Study Group was inline with the course ethos, but it also revealed a technical issue on the platform. When a Learner left a group and subsequently joined a new one, allocation was at random. FutureLearn did not have the ability to cap the number of Study Groups so Learners would end up in a new group with just themselves.

On reflection, Educators also found the functionality of the Study Groups difficult to moderate. One critical complication being that the Study Group message board system only allowed a linear and chronological posting of messages. Messages of support were often given by the Educators, however, the linear structure of the discussion made it difficult to facilitate a deeper discussion into the environmental challenges and the tools that were introduced. The discussion space could not allow the pinning of important messages, which Educators can do in the Steps of the main course material. As mentioned above the Lead Educator can broadcast or send messages to all the groups but these quickly get lost as new messages come in. Learners would leave feedback and it was difficult to follow the developing discussions with this flow of information.

Due to the issues stated above, contributing to the Study Groups would be even more difficult for the Learners who registered as the course was in progress. As the MOOC developed there was a noted drop in participation in the Study Group discussions. However, as explained in Section 2.2, the participation pattern in MOOC showed a decrease as the weeks progressed, so this trend was expected. When the course had finished, 42% of the Padlet boards had been populated to varying degrees with two Study Groups having completed the majority of the tasks. The Empathy Timeline activity tool brought on the greatest number of contributions, with Learners contributing many positives and negatives about the environmental challenge being discussed. The high-level of participation could again be down to the higher engagement rate at the start of the course.

The feedback on the Study Groups from the Learners and Educators makes it clear that the incorporation of this additional way of working on the FutureLearn platform is not developed enough for the needs of this course. The removal of the Study Groups for future iterations of this course is certain, however, the inclusion of co-creation tools and activities will remain as part of the contribution this course makes to the CS and CO landscape. Since the completion of the first iteration of the WeObserve MOOC, there have been developments in the WeObserve toolkits and the inclusion of these would support the uptake and use of the resources WeObserve contributes to the field.

3.3 Suggested changes for Iteration II

Based on the enrolment data from the first run, and findings from the academic literature pointing out at lack of time and challenging course design as reasons for dropouts in MOOCs (Gütl et al., 2014), we will tweak different elements of the structure, language, content and marketing of the course with the aim to increase joiners and completers in the second run.

The proposed changes include:

- Marketing to increase enrolment numbers: re-invite learners from the first run who did not complete the course, as well as inviting GROW MOOC learners to take part. For more details on the marketing plans to contribute to the sustainability of the WeObserve MOOC, see Section 4.1.
- We will remove jargon even further in the least visited data steps; some examples of terms that could be better defined include: calibration, gold standard, API, or real time.
- Offering multiple indirect options for learning and creativity seem to increase participation in online CS activities (Jennett et al., 2016). To foster these opportunities, we will include the latest WeObserve open access tools to support learners to see the content as more actionable and useful to them and their communities.
- Linked to the previous point, we will also emphasise the existing local focus we want to communicate through the course content and encourage learners to use their creativity and experience to adapt the tools to their specific local contexts, projects and aspirations. This is in line with evidence from the literature that suggests that some of the strongest motivators for volunteers to participate in nature related projects is interest in the environment and an interest in protecting a local natural resource (Frensley et al., 2017); other studies point in a similar direction, highlighting motivations around seeking knowledge, participating in the learning activity and its social interactions as well as understanding ecosystems and expressing one's values (Van der Berg et al., 2009). The introductory steps of the course already ask learners to share their motivations for joining the course. At this stage, the course materials are already finalised, but there is scope to share further resources on the forum and via the weekly emails to meet learners' motivations and objectives where possible. By fostering the localised application of tools and other resources, and social connections on the forum, we are hoping to tap into those common reported motivators.
- As evidenced in the Insight section on Study Groups, we will remove this part of the course. We will instead focus on the open tools and how they can provide a platform for collaboration.
- Make content timely and up to date: new course steps will be added to cover the topic of how citizen science and COs have been and could be of help during national and global pandemics. The CS community is already compiling resources here: https://eu-citizen.science/citizen-science-resources-related-covid19-pandemic/ and a distribution email list is being led by Cornell University at CitSci-discussion-L@cornell.edu.
- Linked to the previous point, we will consider how engagement between people and using online tools has changed and increased in response to the global pandemic, and how this is impacting the way people learn and collaborate. We have seen that online participation platforms are on the rise but there is also a lot more competition for people's digital time and attention.
- As learner engagement went down as the course progressed, we may also reduce the length of weeks and least visited steps to encourage completion, combining less data dense steps with links to extra resources/exercises for those learners keen to learn more on specific topics.
- Assess impact of participation: add a new poll to ask 1) whether learners are more likely to take part in a CS project now and b) whether they have taken part in any since the last course.

- To foster the continuation of an online community beyond the end of the MOOC, we will apply to mechanisms:
    - Futureproof content for potential light touch' and no-moderation iterations of the course beyond the end of the funded period of the project. See specific recommendations in Section 4 of this Deliverable.
    - Advertise WeObserve Communities of Practices at the beginning of the course so that all learners, even those who do not complete the course, are aware of this opportunity.
    - Grow a community of people interested in citizen science projects, that includes both learners and educators. Many of the course Learners are active in the CS community, and educators found that they were both supporting learners and learning from them through the discussion forums.

3.4 International reach and replicability beyond Europe for COs' wider uptake

As mentioned earlier in this deliverable, the objective of Work Package 3 is to accelerate the uptake of the WeObserve Knowledge Base. One of the mechanisms to increase uptake is to increase the reach of WeObserve activities, and more specifically, the number of learners reached by the MOOC. However, MOOCs are a resource intensive tool. Below we consider certain challenges and opportunities to amplify the impact of the WeObserve MOOC.

The development of course involved interdisciplinary multimedia content, including articles, videos, polls and quizzes, so development was time consuming and required the mobilisation of a wide range of experts and technicians. Nevertheless, once created, the course would be able to run after the end of the project and potentially in future replication projects with minor edits, thus extending the life of the content and lowering the overall overhead costs of time and resources needed for their creation.

As previously mentioned, FutureLearn is an international platform open to anybody in the world able to access a computer with an internet connection. People who enrolled in the first run of the WeObserve MOOC were based in 107 countries, many located outside Europe. Thus, the WeObserve MOOC has already been tested at an international and multicultural level as reflected in the map and list of included MOOC joiners per country (Figure 7).

The digital opportunity and the transformative potential of MOOCs has also been demonstrated. MOOCs highlight the importance of social learning and the power of online communities to share knowledge and best practices. MOOCs are a great channel to educate, connect and inspire thousands of people from all over the world. The scale of the worldwide environmental issues we are facing requires solutions that have international scale and reach, and can translate into local actions, and MOOCs are able to offer both.

Any future implementation of the WeObserve MOOC and other tools with a focus on non-European audiences could benefit from a post MOOC migration of participants to other platforms in social media where those communities already meet, as a way to maintain the momentum after the final run of the course before the funded life of the project ends.

FutureLearn is being promoted by eLearnAfrica (https://www.elearnafrica.com/), an initiative working on a number of partnerships to boost online education throughout Africa. While

learners need an internet connection, which could be a challenge in some regions, NGOs and farmers' organisations could offer the facilities for learners to take part individually or in groups to support the creation of local observatories.

4 Sustainability and promotion of MOOC content and community

A key task for WP3 is to ensure the sustainability of the WeObserve MOOC content for wider uptake and long lasting impact. Several measures are being implemented to achieve this goal:

4.1 Promotion of MOOC and further CS opportunities during the life of the WeObserve project

In this section we first present the plans for encouraging even more people to join and complete the WeObserve MOOC. Second, we share a list of resources we will be sharing with learners via the revised content of the MOOC and the WeObserve Knowledge Base to enable communities to discover and explore options for continuing learning about and participating in CS before the end of the project.

4.1.1 Promoting the WeObserve MOOC Run II to increase enrolment numbers and participation rates

We will work across Work Packages to iterate the advertising MOOC campaign from 2019 and expand it further by trying new channels, with the aim of increasing enrolment and retention in the second run of the online course in autumn 2020. The strategy includes the mechanisms that proved effective when promoting the initial run of the course (A to C) plus new ones (D and E):

A. Promotion through WeObserve social media channels
B. Targeted relevant partners mailing lists: ECSA Newsletter, WAAG Society, EU-Citizen Science project (2019), Measuring Impact of Citizen Science project (MICS, 2020), etc
C. Blog posts on WeObserve website
D. Promotion through FutureLearn to contact the cohort from the first run to encourage learners who did not complete the course in 2019, to join the 2nd iteration.
E. WeObserve events where possible (face to face events might be cancelled or take an online format due to the coronavirus pandemic).

In the final year of the project, a final report will provide an evaluation of the WeObserve Distance Learning Programme for both this first MOOC and the second MOOC planned for autumn 2020, positioned within wider project efforts in the context of WP3 *Accelerate*, to stimulate uptake of the citizen observatories knowledge base - and not in isolation. These other initiatives include:

- Deliverable 3.1 *WeObserve toolkits for building champion communities I* (Coulson, S. et al., 2018).
- Deliverable 3.2 *WeObserve distance learning programme I* (Coulson, S. et al., 2019).

- Deliverable 3.3 *WeObserve Toolkits for Building Champion Communities II* (Ajates and Woods, 2020).
- Deliverable 2.8 *WeObserve Cookbook: Guidelines for creating successful and sustainable Citizens Observatories* (WeObserve consortium, forthcoming - now) WP2's WeObserve Cookbook is now scheduled for publication in spring 2021).

This final WeObserve report will also present the final agreed details for the sustainability of course content after the end of the project (see section 4.2).

4.1.2 Next steps and resources for WeObserve MOOC learners

This list below puts forward a number of proposals and resources to be included in the next iteration of the MOOC and to be shared also on the WeObserve Knowledge Base. The plan is to share with the WeObserve and MOOC participants and followers a list of options they can explore to continue learning about and participating in CS. By sharing this information before the end of the project, we will be able to support the transition and answer any questions from interested parties, which we hope will increase the long term sustainability of this emerging community.

We will also provide an update on whether WeObserve social media channels will be maintained for the community with light moderation from key members of the team as long as they remain in use, and is practical.

MOOC learners will be encouraged to extend the list by including additional opportunities from their own areas/countries. The list included the following opportunities:

A. Online Learning
- Direct learners to EU-Citizen.Science platform: https://eu-citizen.science/curated/
- Alert learners of potential future WeObserve MOOC runs with little facilitation

B. Any relevant future data hacks from other projects
- Relevant opportunities similar to the WeObserve Open Data Challenge and the Inspire Hackathon that might be running in and after Sep 2020 will be shared with learners.

C. Knowledge Base Resources
- WeObserve KB: https://www.weobserve.eu/knowledge-base/
- We will alert learners of the forthcoming WeObserve Cookbook, which will be uploaded to the WeObserve KB when ready.
- GROW KB: https://knowledge.growobservatory.org/
  Including:
  - Regenerative Food Growing Practices: https://knowledge.growobservatory.org/article-categories/regenerative-food-growing-practices/
  - Set up your own growing experiment: on the WeObserve Knowledge Base

D. Other Citizen Science projects and organisations:
- WeObserve Communities of Practice: https://www.weobserve.eu/cops/
- EU-Citizen.Science: Coordinate, Engage and Create Citizen Science Projects - http://eu-citizen.science/

- European Citizen Science Association (ECSA): https://ecsa.citizen-science.net/
- The Sci Starter database of citizen science projects: https://www.scistarter.org/
- Measuring Impact of Citizen Science (MICS): https://mics.tools/about-mics/citizen-science

E. Funding Opportunities for communities and citizens:

- Erasmus+: https://www.erasmusplus.org.uk/apply-for-funding
- Electronic Platform for Adult Learning in Europe (EPALE): https://www.erasmusplus.org.uk/blog/how-epale-can-help-you-with-your-erasmus-project
- Adult learning programme: https://ec.europa.eu/programmes/erasmus-plus/opportunities/individuals/staff-training/adult-education_en
- Europe for citizens: https://eacea.ec.europa.eu/europe-for-citizens/news/call-for-proposals-networks-towns-2019-round-2_en
- Networks of Towns Open Call: https://eacea.ec.europa.eu/europe-for-citizens/funding/networks-towns-2019-round-2_en
- Civil Society projects: https://eacea.ec.europa.eu/europe-for-citizens/funding/civil-society-projects-2019_en
- Cost Actions: https://www.cost.eu/cost-actions/what-are-cost-actions/ - We will mention the forthcoming SDGs and CS Cost Action Group that the WeObserve CoP on SDGs is leading the formation of.

4.2 MOOC content sustainability strategy after the end of the project

Work Package 3 is focussed on supporting the acceleration and uptake of CO tools, including the MOOC. Thus, any plans to secure the future access and usability of the MOOC content are part of a wider strategy encompassing all components of the WeObserve Toolkit, which was detailed in D3.3 *WeObserve Toolkits for Building Champion Communities II*. The final details of this strategy will be formalised during autumn 2020, nevertheless the planning work has already started, and options currently being explored included:

- Promotion and transfer of all/selected MOOC content through relevant projects such as Measuring Impact of Citizen Science (MICS) and the EU-Citizen.Science learning platform (EU-Citizen.Science Consortium, 2019).
- All WeObserve open access tools will continue to be available via Zenodo https://zenodo.org/communities/weobserve/ and other relevant repositories, such as UoD Discovery, and linked to associated WeObserve CO publications for wider impact. A selection of MOOC content could be converted into shorter info sheets and uploaded to the most relevant repository/ies.

4.3 'Light touch' and no facilitation MOOC runs

The WeObserve Consortium is exploring the possibility of running future iterations of the WeObserve MOOC on the FutureLearn platform without moderation potentially during, but more likely after the end of the project to continue to disseminate the content and WeObserve tools. FutureLearn's model of MOOCs is changing and the platform team has

been testing and monitoring engagement and completion on courses run with less or without educators' supervision - with positive results so far.

Normally, course facilitators guide learners through step comments, offering feedback and encouraging further conversations, both for those who comment and those who read the comments. FutureLearn has recently started to provide guidance on how partners can run courses with light or even no facilitation, while maintaining a rich social learning experience for learners. Some of the key recommendations that the WeObserve team is exploring to inform the review and update the course content for the next run are:

1. Managing learner expectations: It's important to let learners know the level of facilitation that will be provided as early as possible in the course, both in the Week 1 email and on the first steps of the course.

2. Establishing educator presence: FutureLearn recommends to focus on three key areas to establish educator presence within courses without direct facilitator involvement:
    a. Using 'I/We' and adopt a personal tone in step text, including weekly introduction steps and end of week reviews.
    b. Including personal, encouraging tone in weekly course emails (there are more tips for writing course emails here).
    c. Adding feedback after learner responses on quiz, test and poll steps. This feedback pops up with the lead educator's profile image.

3. Identifying steps where learners are more likely to post the most comments, for example, introductory and discussion steps where learners are prompted to make a contribution. The advice is to prioritise these steps along with the steps at the start and end of each week. The FutureLearn platform provides a comprehensive Facilitation Dashboard that offers metrics to help identify steps which are most active. Additionally, if a discussion step has few responses, facilitators can also focus on those to help provoke conversation.

4. Using 'pinned' posts to keep interesting/provocative learner comments and facilitator responses at the top of the comments feed. We think that pinning your own posts is good practice and helps build educator presence, but pinning an interesting learner comment then replying with a follow up question to encourage more learner comments is even better.

Overall, the focus should be on peer-to-peer social learning and on encouraging these interactions wherever possible. Analysing metrics and insights from the first run has also helped us identify common questions and key steps to review for an updated version of the content. Furthermore FutureLearn courses are reactively moderated by a specialist third party moderation service. If a learner 'flags' a comment, this team responds in accordance with moderation guidelines based on our Code of Conduct, Terms & Conditions, and best practice; this additional moderation is a supplementary safety measure to ensure the wellbeing of all learners welcomed by the WeObserve team, which provides further reassurance for potential future 'light touch' and no facilitation MOOC runs.

5 Conclusions

This deliverable has provided a detailed account of the progress of WeObserve's Distance Learning Programme delivered on the FutureLearn platform. The course, titled "Citizen Science projects: How to make a difference" ran on the FutureLearn platform for the first time in November 2019 for four weeks. In this report we have provided detailed statistics on the structure of the MOOC, enrollment and participation numbers for this first run. The statistics reflect similar patterns of participation, engagement and completion to other free MOOCs in the same subject areas (a) nature and environment and b) science, engineering and mathematics), with a high number of enrolments that consolidates in a lower number of engaged learners toward the end of the course.

The course will run again in September 2020. By the end of the project, hundreds of citizens, across all age groups and locations (having reached learners in 107 countries in the first run so far) will have been learning together thanks to two runs of a truly transdisciplinary online course. These combined eight weeks of education have enabled the exchange of ideas and resources amongst learners and social and natural scientists, helping to democratise access to science and to value different types of expertise and knowledge. The course has aimed to facilitate the emergence of a thriving community of citizen scientists across Europe and beyond, who will continue to contribute to the legacy of WeObserve and COs beyond the funded end of the project. The MOOC has successfully brought together for the first time expertise from the four WeObserve Citizens' Observatories in an accessible manner to hundreds of citizens.

The popularity of MOOCs has skyrocketed over the last couple of months, as people explore new ways to keep learning while in lockdown and adhering to social distancing public health advice (Schaffhauser, 2020). MOOCs offer a vehicle for citizens to create and find online communities of interest, to interact with other learners and educators and to gain and share new knowledge. To foster that sense of ongoing community, the last run of the course during the funded life of the project will be designed to provide learners with a set of options to continue learning, and information on how to look for fundings and resources to set up their own CS projects. Finally, the WeObserve team is also exploring 'light touch' and no facilitation MOOC runs, a new model trialled and tested with success by FutureLearn.

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Linked WeObserve deliverables

Deliverable	Status
Deliverable 3.1 WeObserve toolkits for building champion communities I	Public
Deliverable 3.2 WeObserve distance learning programme I	Public
Deliverable 3.3 WeObserve toolkits for building champion communities II	Public
Deliverable 2.8 WeObserve Cookbook: Guidelines for creating successful and sustainable Citizens Observatories	Public

Appendix 1: FutureLearn Course Run Metrics

Definition of metrics

- Joiners are the number of currently existing enrolments made for that specific course run. This includes educators, admins alongside learners who currently have accounts on the platform.
- Leavers are users (of any role) who have chosen to no longer be a part of the course. Leavers are represented in the number of Joiners. Also presented as a percentage of joiners.
- Learners are users (of any role) who have at least viewed at least one step, at any time, in any course week. This includes those who go on to become Leavers. Also presented as a percentage of Joiners.
- The average number of Learners on a course is 62.2% of Joiners.*
- Active Learners are those (of any role) who have completed at least one step at any time in any course week, including those who go on to become Leavers. Completion varies by step type, with some requiring additional user interaction (e.g. "mark as complete") while others are completed through submission (Assignment, Review) and question attempts (Quizzes & Tests). Also presented as a percentage of Learners.
- The average number of Active Learners on a course is 65.8% of Learners.*
- Social Learners are those (of any role) who have posted at least one comment on any step. Also presented as a percentage of Learners.
- The average number of Social Learners on a course is 28.3% of Learners.*
- Learners who've marked 50% or more of steps complete represent users (of any role) who have successfully completed 50% or more of the steps contained in the course.
- The average number of 50% or more steps completed is 21.3% of Learners.*
- Learners who've marked 90% or more of steps complete represents users (of any role) who have successfully completed 90% or more of the steps contained in the course.
- The average number of 50% or more steps completed is 14.1% of Learners.*
- Note: For a course that contains Tests or Quizzes: these are considered 'marked as complete' when a learner has attempted each question at least once.

** Accurate as of November 2018 based on all open, discoverable courses from 1 Aug 2017 – 31 July 2018 (read more).*

- Deprecated course run measures (available for course runs that started before 6 March 2017)
- Fully Participating Learners are those who have completed at least 50% of the available steps on a course. On courses containing tests, they must also complete them. Test completion is defined as all non-voided questions having been attempted regardless of result. Learners cannot be counted as fully participating until all the weeks of a course have been published and are visible to them.
- The average number of fully participating learners on a course is 21% of learners.**
- Returning Learners are those who completed at least a step in at least two distinct course weeks. These do not have to be sequential or consecutive, nor completed in different calendar weeks. This is also presented as a percentage of learners.
- The average number of returning learners on a course is 40% of learners.**

*** Accurate as of September 2015 based on courses starting in 2014/15 academic year.*

Appendix 2: Comparative enrolment figures for WeObserve MOOC

Below we provide four graphs to show the Category Performance (within FL Category across FutureLearn) and Course Performance within Category (course compared to all courses within Category across FutureLearn). The WeObserve MOOC categories, selected based on the nature of the content and themes covered, were: a) Science and environment and b) Science, engineering and maths. Below, under the Category Performance (Within Category across FutureLearn) heading two tables indicate:

- The white rows show average statistics for the nature and environment category, and the grey rows show average statistics for the science, engineering and maths category.
- The colour coded columns in the first two tables below show how the category performs in comparison to other categories in the FL platform.

Under the Course Performance within Category (Course compared to All Courses within Category across FutureLearn) heading

- The white columns show statistics for the WeObserve MOOC.
- The colour coded columns show how the WeObserve MOOC statistics compare to the nature and environment category (first row in white), and to the science, engineering and maths category (second row in grey).

Category Performance (Within Category across FutureLearn):

	Category	Enrolments	Enrolments	% Activated	% Activated
1	nature_and_environment	18,428	1st Quarter	52.0%	2nd Quarter
2	science_engineering_and_maths	21,871	2nd Quarter	50.2%	2nd Quarter

	Category	Visited 25%	Visited 25%	Visited 50%	Visited 50%	Visited 75%	Visited 75%
1	science_engineering_and_maths	17.9%	2nd Quarter	17.9%	2nd Quarter	17.9%	2nd Quarter
2	nature_and_environment	20.1%	2nd Quarter	20.1%	2nd Quarter	20.1%	2nd Quarter

Course Performance within Category (Course compared to All Courses within Category across FutureLearn):

	Course Slug	Category	Enrolments	Enrolments	% Activated	% Activated
1	weobserve-the-earth	nature_and_environment	973	4th Quarter	44.4%	3rd Quarter
2	weobserve-the-earth	science_engineering_and_maths	973	4th Quarter	44.4%	3rd Quarter

	Category	Visited 25%	Visited 25%	Visited 50%	Visited 50%	Visited 75%	Visited 75%	Fully Completed	Fully Completed
1	nature_and_environment	21.3%	2nd Quarter	21.3%	2nd Quarter	21.3%	2nd Quarter	20.4%	3rd Quarter
2	science_engineering_and_maths	21.3%	2nd Quarter	21.3%	2nd Quarter	21.3%	2nd Quarter	20.4%	2nd Quarter

Appendix 3: Full list of countries represented in the WeObserve MOOC

Country Name	Enrolments
United Kingdom	211
United States of America	50
unknown	46
Italy	42
Spain	42
India	34
Nigeria	28
Netherlands	28
Greece	26
Australia	26
Germany	21
Portugal	19
Brazil	19
Ireland	18
South Africa	16
Indonesia	14
Pakistan	13
France	12
Egypt	11
Philippines	11
Mexico	11
Canada	10
Kenya	10
Finland	10
Myanmar	9
Belgium	8
Ghana	7
Cameroon	7
Czech Republic	7
China	6
Switzerland	6
Turkey	6
Bangladesh	6
Austria	6
Albania	5
Colombia	5
Hungary	5
Japan	5
Malaysia	5
Romania	5
Slovenia	5
Thailand	5
Vietnam	5
Bulgaria	4
Ukraine	4
Ethiopia	4
Tanzania	4
Iran	3
Ecuador	3
Korea (South)	3
Malawi	3
Uruguay	3
Denmark	3
Cyprus	3
New Zealand	3
Croatia	3
Peru	3
Poland	3
Serbia	3
Singapore	3
Sudan	3
Sweden	3
Taiwan	3
United Arab Emirates	3
Benin	3
Syria	2
Hong Kong	2
Kazakhstan	2
Zimbabwe	2
Somalia	2
Israel	2
Nepal	2
Sri Lanka	2
Palestine	2
Madagascar	2
Zambia	2
Swaziland	2
Uganda	2
Malta	2
Botswana	2
Morocco	2
Mozambique	2
Tunisia	2
Algeria	1
Latvia	1
Libya	1
Lithuania	1
Luxembourg	1
Trinidad and Tobago	1
Namibia	1
Dominican Republic	1
Mali	1
Bolivia	1
Costa Rica	1
Georgia	1
Cayman Islands	1
Fiji	1
Burundi	1
Venezuela	1
Russia	1
Saudi Arabia	1
Senegal	1
Honduras	1
Jersey	1
Brunei	1
Argentina	1
Iceland	1
Jordan	1
Guinea	1

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