

Fostering Communities of Practices for teachers' professional development integrating OER and MOOC

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Abstract. This research in progress reports on challenges and strategies to start a community of practice (CoP) for teacher's professional development through open educational resources (OER) integrated to massive open online courses (MOOC). This study focused on the ENGAGE community in the UK with more than 2500 teachers during its first 6 months. ENGAGE is a European project whose aim is to equip educators and students for active engagement in Science through Responsible Research and Innovation (RRI) and Inquiry based learning (IBL). Its platform translated in 10 languages provides socio-scientific OER based on science-in-the news and MOOC for professional development. Preliminary outcomes based on qualitative data from ENGAGE platform and quantitative data from its users' analytics indicate key strategies to integrate OER and MOOC to foster CoP.

Keywords: Teachers' CPD, RRI, IBL, CoP, OER, MOOC

1 Research Context

ENGAGE is a three-year European Project (2014-2016), which includes 14 Institutions in 13 countries. Its purpose is to increase awareness of Responsible Research and Innovation (RRI) through Inquiry Based Learning (IBL) by reaching more than 12000 teachers in Europe and 360000 students. For that, its key issue is to guide teachers to change [1] how science is taught from teaching focused on science as a body of content to equipping students with the skills and knowledge to use science in their lives. In ENGAGE, RRI in Science Education means giving students opportunity for self-expression and responsibility for coming to informed decisions. This research in progress investigates barriers and recommendations to foster Communities of Practice (CoP) for teacher's professional development through Open Educational Resources (OER) integrated to Massive Open Online Courses (MOOC).

The concept of CoP refers to the process of knowing through active engagement [2], where knowledge is situated in experience [3]. In ENGAGE, Teachers' CoP refers to the collaborative construction of knowledge by introducing new pedagogic tools for developing understanding of RRI and encouraging critical reflection within the CoP. Teaching in an RRI context requires teachers to learn new skills. Firstly, they have to adopt new teaching strategies to their repertoire. Secondly, they need to adapt their existing practice to integrate the social enterprise of science. Thirdly, in order to

transform and innovate their practice they need to master what we are calling an RRI ‘toolkit’, to equip students for integrating conceptual knowledge, inquiry skills and societal values for solving dilemmas, making better decisions or designing solutions.

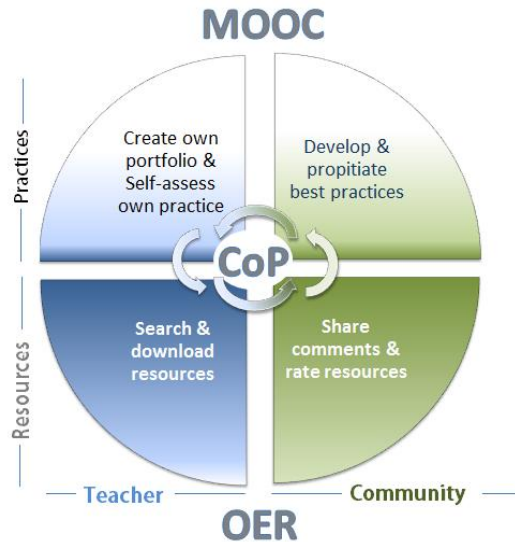


Figure 1: ENGAGE HUB

The ENGAGE Hub (Fig1) was designed to support the teachers CoP and facilitate the growth of teachers’ knowledge. It provides a platform to distribute IBL focused OER for developing pupils RRI skills as well as giving teachers’ access to a MOOC to provide professional development resources and activities. The challenge for ENGAGE hub was to cater for the needs of teachers across 13 countries and working in very different contexts. Its platform was developed using WordPress for just-in-time OER production based on Science-in-the-news. It was configured as a network of sites (WPMU) in order to have a site for each language and linked to social media platforms, e.g.: SlideShare, YouTube, Pinterest, Facebook and Twitter. A set of widgets was embedded around content for teachers to share preferences, opinions and reviews. Their user profile was extended to include their professional development pathway based on their interactions on both the OER and MOOC environments. The EdX MOOC login system was integrated to the WordPress with automatic authentication to facilitate user access to online courses. The ENGAGE video library was setup on YouTube and is focused on teachers’ interests, needs and productions. MOOC was designed to support teachers’ best practices and promote knowledge exchange to foster their CoP [4].

The Knowledge Hub, which is open to everyone, delivers information about OER and their use together with reviews by the community. Visitors must sign in the ENGAGE hub to be able to download the resources, guidelines and participate in MOOC. Then as members, they can access, rate and comment on OER, develop teaching skills through MOOC. As reflective practitioners they can keep their professional development pathway updated in the CoP through self-assessment and own online portfolio of OER they have adapted. These are unique features to Engage.

The CoP is designed to build a sense of community by facilitating interaction between members and rewarding committed members. The platform gathers evidence on OER usage and comments or reviews posted about achievements with OER or in the MOOC environment. Through accumulated interaction with the ENGAGE hub they can also be recognised as experts within the CoP. As experts they can be invited to interact as MOOC facilitators.

2 Findings and Conclusions

Findings based on the user analytics during the first six months after the launch of the OER platform shows that ENGAGE UK reached beyond its target with 2625 users registered and 11368 materials downloaded. The three most accessed materials had more than 1600 visits and the four most popular materials shows more than 250 files downloaded. Approximately 60% of users access various resources and 75% return to the website. The average time of users on the website is 5 minutes.

However, the number of users' contributions was low. There were only 27 comments related to 22 OER materials published. This indicates that a key challenge identified in this study is the need to promote teachers' participation in the CoP particularly encouraging them to share reviews about resources and tools used in their lessons for knowledge exchange. Further potential barriers that might affect teachers' participation in CoP taken from the RRI curriculum survey in the UK [5] were investigated. These include time constraints, curriculum changes, focus centred on content, unfamiliarity with RRI, strategies for assessment and clear understanding of ENGAGE benefits.

Qualitative data from comments and reviews about OER by teachers showed evidence on how they have been using materials and enriching their practice. It was possible to map initial results, challenges and benefits. Although the number of comments included in the portal was a few, data showed that the majority considered ENGAGE materials interesting for students. Teachers declared that OER were effective for engaging students with the activities, including videos and resources.

Interviews during ENGAGE events indicated that teachers found the platform attractive and interactive. The tag system was useful to overview key components. The OER description and reviews also provided helpful information for lesson planning. Data suggested that teachers are more encouraged to share their comments when they read previous ones suggesting that seeding of discussions might be a useful strategy. This might also create opportunities for more interaction, reflection and knowledge exchange. Further common categories for improving the ENGAGE hub that emerged from the data were: different uses of materials, extra resources, specific learning outcomes and achievements, pedagogical strategies, benefits and challenges. These features have been embedded in an activity in a new MOOC, which will be used in the next phase of the project and will encourage teachers to reflect on their practice and share it in the CoP.

Year group: "This resource engaged a class of Year 8 boys"

Attractive features: "it was well presented, easy to navigate around"

Pedagogical strategy: "Setting the science in context"

<p>Learning outcomes: “it helped learners to understand the importance of pedigree diagrams and has given them an excellent platform for GCSE Science”</p> <p>Additional benefits: “The issues/dilemmas of taking a test, the ignorance of some and possible prejudice of others gave the series of lessons an extra dimension for the boys to hook their knowledge and understanding of genetic inheritance onto.”</p>
<p>Year group: “I used the Solar Roadways activity with GCSE group working on AQA A Core Science”</p> <p>Attractive features: “it has been so well designed and there is real data to look at, students found the activity engaging”</p> <p>Pedagogical strategy: “I used it to develop students writing and in particular, being able to write balanced arguments using evidence”</p> <p>Learning outcomes: “it helped them to develop evaluation skills and extended writing using persuasive language and evidence”</p> <p>Additional benefits: “Engage activities are an excellent resource for KS3 and KS4”</p>

New functionalities of the ENGAGE Hub will be available for the CoP to increase teachers’ participation in the community, for instance, “liking” for providing very fast feedback on materials and comments; advanced search, FAQ and blog stories about pedagogical tools. Collaborators with specific roles might also be important to set up group identity and guidance for more interaction [6].

Responsible Research and Innovation in Education is a very new and challenging issue, which will require from all partners in-depth research with teacher communities in order to understand potential barriers and achievements [7]. Fostering the ENGAGE CoP [8] successfully will be very relevant to innovate teaching practices [8] and bring science closer to students' lives via responsible research and innovation.

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