D4.1: Science communication education and training across Europe

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EXECUTIVE SUMMARY

In the last decades, science communication has increasingly taken a high profile role in society. It is widely acknowledged that informing, involving and engaging the general public is key to countering misinformation, gaining funding and support, and ensuring science’s legitimacy. Further, listening to public values, expectations, and fears in two-way dialogue helps scientists in their work.

Science communication helps to build trust, defends both personal and institutional reputations, can assist with crisis communication, and can help make science more competitive. Last but not least, scientists have to account for what they do. In frameworks of Responsible Research and Innovation (RRI) they have a social responsibility towards taxpayers, and communication is one aspect of this.

All projects funded under Horizon 2020, the current EU Framework Programme for Research and Innovation, are asked to engage in communicating science to audiences beyond their peers. Indeed, a 2002 Science and Society Action Plan states that: «In the training of scientists, particular attention must be given to areas that may prove essential in the exercise of their professions. These include project management (particularly on a European scale), law (intellectual property, ethics, etc.) and communication (to the general public in particular)».

The current landscape of science communication education and training in Europe is far from the level the Action Plan suggests. While one can find both formal (such as master’s programmes) and informal (such as brief training for PhD students) educations in science communication in most European countries, at least some of these initiatives are ‘artisanal’: small-scale, ad-hoc, or dependent on one or two individuals. Aside from a few key sites where there is a substantial history of teaching science communication, there is therefore much discontinuity in science communication training.

There is also significant diversity in what is offered within science communication training and education. Courses originate from different fields of research and diverse academic contexts, including natural science departments; education; sociology or philosophy faculties (Science and Technology Studies, STS); communication, media and journalism schools. This influences the background of teachers and the content of the course, as well as the students targeted and career opportunities from the course. There is also a range of approaches taken to teaching, from more theoretical to others with more practical emphases within course activities.

Though there are a few cases of training specifically oriented to science journalism or museum careers, most courses prepare students for a range of different jobs, including in mainstream and new media, and media and public relation offices of universities or other research organisations. A few courses aim to prepare students for leadership and communication in the commercial medical sector, as well as public health policy, administration and regulation.

Private companies are also one aspect of the training landscape. At least some science communication consultancies have noted the increasing need of communication skills and offer media training for scientists, as well as for pharmacological or technological industries. This sector is growing, but will not be mapped in our analysis.

The target and purpose of each course has an impact on its duration, which commonly ranges from one day or a few weeks (particularly for working scientists) to full programmes at anything from a BA to PhD level for scholars, science journalists, and professional communicators. Most are face-to-face courses, but some providers have also set online or mixed programmes.
This diverse landscape can be construed as confusing and inconsistent. At the same time, however, it offers different pathways that mirror eclectic demand from students (from young undergraduates to established scientists) and the diverse range of professional activities that comprise science communication.

Finally, even without common best practices throughout science communication education and training initiatives in Europe, there is a repeated emphasis on three characteristics of good quality science communication training.

- Science communication teaching should be practice-based. This may mean both practical skills being included in course content of learning, and/or taking a practical, hands-on approach to teaching.

- Science communication teaching should equip students with skills in critical thinking, particularly in terms of reflecting critically on science and its role in society.

- Science communication teaching should be interdisciplinary, and involve cooperation between diverse researchers, scholars, professional communicators and journalists.

The current document is a preliminary version of the report, that will be finalized by January 2020.
**ABBREVIATIONS**

EU European Union  
RRI Responsible Research & Innovation  
EUPRIO European Association of Communication Professional in Higher Education  
CPD Continuous Professional Development  
PCST Public Communication of Science and Technology  
STS Science and Technology Studies
# TABLE OF CONTENTS

## SECTION 1: INTRODUCTION

SECTION 2: SCIENCE COMMUNICATION EDUCATION: INSIGHTS FROM THE LITERATURE... 8

2.1 Variety: a strength or a weakness? ................................................................. 9

2.2: What should be taught in science communication courses? .......................... 9

2.3: Who should be taught in science communication courses? ............................ 10

2.4: Training in how and why to communicate science ...................................... 11

2.5: A transition from negative to positive attitudes amongst scientists ............... 12

## SECTION 3: SCIENCE COMMUNICATION EDUCATION IN EUROPE: THE STAKEHOLDERS’ VIEW..... 15

3.1 Science communication education in Europe .............................................. 15

3.2 Science Journalism Training in Europe ....................................................... 18

3.3 Science communication education for museums ........................................ 20

3.4 Science communication education within EUROPEAN universities and research centres ..... 20

3.5 Training and education about and through social media ................................ 21

## SECTION 4: MAPPING SCIENCE COMMUNICATION TEACHING ACROSS EUROPE ................. 22

4.1 Key sites and centres according to expert interviews ...................................... 22

4.2 Science communication education and training in Europe: a map ...................... 23

4.3 Case studies ..................................................................................................... 27

## SECTION 5: CONCLUSION .................................................................................... 29

REFERENCES ........................................................................................................... 30
SECTION 1: INTRODUCTION

This report provides an overview of current practice in science communication education and training across Europe. Its aim is to review contemporary activities, and best practice, in supporting the development of science communicators. As the report will indicate, this is a complex and diverse field, with a multitude of activities taking place, not all of which are readily traceable.

The report is best read in combination with D1.1 - Summary report: European Science Communication Today, which describes contemporary research and practice in science communication across Europe, as there are significant parallels between issues in scholarship and education, not least in what we have identified as a plurality of approaches, structures, and communities.

The report is based on 3 activities.

- First, a literature review of academic work on science communication education. This provides an overview of international discourse, standards, and best practice on teaching science communication and a final, specific, section on scientific literature on professional development of museum practitioners.

- Second, an assessment of the views of European experts and practitioners on science communication education. This work involved:
  
  - Three sets of one to one interviews: one with key scholars and teachers of science communication across Europe, one with specialist science journalists, press officers, editors and a last one with experts in science museums. These semi-structured interviews involved questions about the contemporary landscape of teaching, research, and practice in Europe and in interviewees’ local contexts.
  
  - This information was further integrated with data gathered through an on-line survey addressed to higher education communicators associated in EUPRIO – European Association of Communication Professional in Higher Education.

- Third, we performed targeted web searches to further map teaching offerings across the EU.

All the information gathered from the academic literature, the interviews, the targeted web searches, and ‘word of mouth’ input from project partners and other collaborators has been used to frame contemporary offerings in science communication education across Europe.

The report proceeds as follows: we begin by providing a narrative summary of academic literature on science communication education (section 1), before discussing key themes from the stakeholder interviews and the survey to EUPRIO associates (section 2). We then map formal science communication teaching across Europe, both using information taken from interviews and our web search. We will also provide some case studies of these activities (section 3). In the concluding section, we offer some reflections on the implications of what we have found.

The current document is a preliminary version of the report, that will be finalized by January 2020.
SECTION 2: SCIENCE COMMUNICATION EDUCATION: INSIGHTS FROM THE LITERATURE

The literature searches identified 39 different papers on science communication and education. Over a third of the literature reviewed comes from outside of Europe, mainly from North America and Australia. However, the themes considered in the non-European literature were the same as in the European, and although there were slight differences in focus – North American literature appears to be more positive towards professional communication courses (Pearce et al 2009) – this was by no means an extensive pattern. **In general, we did not notice many differences between EU and non-EU literature.** We have therefore chosen to include all this literature in the study, regardless of its origin. In addition, a number of the articles present an overview of the field of science communication education, identifying core elements and considering the situation inside and outside North America, Australia and Europe. This is a general trend in the literature (e.g. Hong and Wehrmann 2010; Pearce et al. 2009; Silva and Bultitude 2009) and is particularly relevant to this report.

The literature reviewed spans from 1997 to the present day. In 1997, an early commentary on science communication education framed the media landscape as changing and thereby anticipated increasing opportunities for public communication. Scientists should be encouraged to make more use of media and be evaluated upon their media activity. Training was already considered as required for such activities (Gasgoigne and Metcalfe 1997: 280).

With this as a starting point, our review summarises the discussions that emerged over the following decades. In general:

- The landscape of science communication education is extremely diverse in its format, content, and location within the academic system;
- Most articles about science communication education connect it to the natural sciences;
- Much of the literature is descriptive (of courses that have natural science as their starting point or home; Bobroff and Bouquet 2016);
- Articles tend to present an overview of the current situation and to give a description of a specific course (e.g. Yeoman et al. 2011);
- An ongoing ambition within the literature is to advertise or support the case that science communication education is important and that it plays a relevant societal role (Edmonston and Dawson 2013; Fiske and Dupree 2014; Semir 2009). One further important element is that young scientists should perceive the importance of public engagement (2011:15);
- As a whole, the literature therefore looks at the field’s strengths and proposes definitive lists of elements or subjects that should be covered by courses.
2.1 VARIETY: A STRENGTH OR A WEAKNESS?

“…there are more differences than similarities in the objectives [of science communication programmes] (Hong and Wehrmann 2010, 237)”.

Science communication education is diverse in its format, content, and location within the academic system. This diversity is a reflection of the growing number in higher education who are engaged with science communication (Trench 2012:1). Within the literature studied, this diversity is regarded as a sign of both the subject’s vitality and of its vulnerability. From the vulnerability point of view, it represents institutional instability, and is an indication that the subject has failed to be “institutionalized” as a recognised specialism within academia (Mellor 2013:922). The subject’s interdisciplinary nature can also mean that it is not always well equipped to defend itself during discussions about institutional policies and economic conditions (Greco 2009; Trench 2012).

Concerning the vitality feature, those who regard variety as a sign of vitality see the science communication community as benefitting from the range of different skills and interests that different courses promote. Wehrmann and van der Sanden (2017) argue that diversity is not a problem. Universities should invest in building collaborations and make use of networks connecting different actors, contexts, and content. Practitioners should be encouraged to innovate, or to become “adaptive experts” who articulate the intermediate space between science, technology and society (2017:2,5).

Despite the lack of coherence in curricula worldwide, existing science communication university masters programmes have been successful in providing students with a general overview of what science communication is. This might be further developed by universities by drawing up visions and views for the status of science communication, how the discipline can fit into academic programmes within the university, and what resources are available to contribute to the programme (Hong and Wehrmann 2010: 238).

2.2: WHAT SHOULD BE TAUGHT IN SCIENCE COMMUNICATION COURSES?

As noted, variety is a key characteristic of science communication education. This includes the content of teaching. The variation in core topics of courses highlights the priorities of those initiating and developing a program (Longnecker and Gondwe 2014: 142, 143). This variation has encouraged a number of authors to try and identify core skills or goals.

About 40 academics, science communication professionals, and students from at least 16 countries, participated to 2 workshops during 10th International Conference on the Public Communication of Science and Technology (PCST) in Malmö, Sweden, in June 2008, (Mulder et al. 2008; Yeoman et al. 2011). They identified four areas common to all courses, but which may be given a different weight in different programmes:

(1) **scientific knowledge** (with or without a formal prior science degree, it is necessary to understand what it is meant to communicate);

(2) **educational studies** (students are taught how to explain scientific issues);

(3) **social studies of science** (so that students understand science’s place in society);

(4) **communication studies** (for instance covering how the media operate).
The number of core elements identified or considered necessary by other research papers varies. Mercer-Mapstone and Kuchel (2017) propose 12 (such as “Identify and understand a suitable target audience” and “Identify the purpose and intended outcome of the communication”; p.191), while Bray et al. (2012) identify 14 important elements (from “An effective communicator is respectful of the audience” to “Science communication courses need to pay attention to communication theory, goals and processes”; p.36).

The main point here, however, is not so much how many core or essential subjects there should be, but the call for **clarity about priorities** within the field: this would support students understanding of the aims and goals behind a course, and help them choose the one most suitable for them.

Clarity will also make it possible to assess the impact of a course (Baram-Tsabari and Lewenstein 2017). The challenge of evaluation is in fact another important consequence of diversity. Neresini and Bucchi (2011) suggest that performance indicators and standards would encourage research institutions to consider public engagement and societal dialogue as an essential element of good science.

Mulder et al. (2008) call not only for a core framework, but also propose the establishment of a database of resources for teaching and a prize for science communication (2008:284). Such a database was in fact produced by ESConet, the European Network of Science Communication Trainers. A team of 24 trainers from 12 countries across Europe, including many media professionals and leading science communication academics, under the EU 6th and 7th Frameworks developed materials for training and workshops freely downloadable from ESConet website under Creative Commons (https://escenet.wordpress.com/). A Science Communication Prize, established in 2004 as part of Descartes Prize, had been then detached in 2007, but seems not to have been refunded. The same seems to have happened to the EU Health Prize for Journalists, confirming the instability of most initiatives in the field, often started and funded within EU projects and then stopped at their end. Other prizes are currently awarded to science journalists and science writers at the European level, for instance by the Association of British Science Writers (ABSW) and by Euroscience.

### 2.3: WHO SHOULD BE TAUGHT IN SCIENCE COMMUNICATION COURSES?

Discussion over whether science communication education for researchers should be part of a science degree or a dedicated course in its own also characterises the literature. Mercer-Mapstone and Kuchel (2017) suggest that both kinds of course are useful because dedicated courses have a degree of transferability between fields, while teaching, learning and assessment skills could usefully be located in existing science curricula (2017:2). The majority of authors, however, focus on one of these sites above the other.

There is broad agreement that training in natural sciences alone does not prepare students for science communication (Edmonston et al. 2010) and that scientists would benefit from science communication training (Besley and Tanner 2011:256). There are therefore strong arguments for incorporating formal communication training into undergraduate and graduate curricula for aspiring scientists. It is proposed that this will enhance the quality of discourse between scientists and the lay public (Brownell et al. 2013), and equip them to reflect upon their role as scientists in society (Bobroff and Bouquet 2016: 2).

Within natural science communication education there is a tendency to focus on skill development rather than on the broader societal context (Besley et al. 2016). Course developers are therefore
encouraged to support students in the development of broad knowledge, both scientific and social, rather than more narrowly focusing on technical communication skills (Bray et al. 2011:38):

“An effective science communicator is aware of the social, political and cultural environment that surrounds the science that they are communicating (Bray et al. 2011:38)”.

In support of professionalised science communicators, it is argued that communication scholars are in general more critical than scientists of the media and of journalists’ use of sources (Besley and Tanner 2011: 254). However, most literature takes the line that it is important not to rely only on professional science journalism or communicators to take full responsibility for public understanding of science (Brownell et al. 2013, Besley et al. 2016). Trench (2017) suggests “a dangerous hubris would arise if (professional) science communicators were to define the practice of science communication as theirs alone”.

In addition to this, most media practices involve interviewing experts directly, so it is important to train scientists in dealing with journalists. University education and other activities should support specialists and prepare the science communicators of the future to facilitate scientists in doing public communication themselves (Trench 2017:7).

Interdisciplinarity and scholar-practitioner partnerships are proposed as one solution to these tensions (Pearce et al. 2009; Seethaler et al. 2019). If scientists better understand the media and their potential audiences, their use of media as partners in reaching their communities and their audiences will foster greater support and understanding of science (Pearce et al. 2009:250).

2.4: TRAINING IN HOW AND WHY TO COMMUNICATE SCIENCE

How and why communication takes place is another central theme within the literature. Communication should be credible, and scientists should ideally have the trust of audiences. Fiske and Dupree (2014) propose that this can be achieved by showing concern for humanity and for the environment. Rather than seeking to persuade, scientists (and audiences) are better served by discussing, teaching, and sharing information, in order to convey their trustworthy intentions (Fiske and Dupree 2014: 13596).

However, there is also broad agreement within the literature that the ‘deficit model’ – in which facts are assumed to speak for themselves when citizens are provided with correct and uncontroversial information – has not been eliminated (Besley et al. 2016; National Academies 2017).

To avoid this, authors suggest that students should be trained to be “active, reflective, responsive communicators” and thereby avoid seeing the role of the science communicator as one simply to translate or disseminate scientific information (Wilkinson et al. 2009:1). Priest et al. (2018) argue that what is needed is reflective thinking about the broader consequences of actions (Priest et al. 2018:1). Based on scientists’ attitudes to communication (discussed in section 2.6), Besley et al. (2014) suggest that communication trainers should emphasize the effectiveness and ethical nature of engagement activities, if they want to attract scientists to communication training (Besley et al. 2014:199).

At the same time, there is criticism of the use of press releases and of competition for prestige between universities and researchers. Highly ranked universities are those that issue the most press releases and have the most public attention in the news media. Although university ranking systems can be
questioned, it seems as though increased media coverage is associated with academic prestige and with communication to a broader public (Carver 2014:3).

It is not just scientists who should reflect on their roles. Demands on journalists and broadcasters are also increasing, often in contradictory ways: they should be more knowledgeable about science, but less involved; they should be supportive, but also more critical (ENSCOT team 2003:167).

2.5: A TRANSITION FROM NEGATIVE TO POSITIVE ATTITUDES AMONGST SCIENTISTS

In the recent past, it was said that science students often do not value communication (Edmondson et al. 2010; Edmondson and Dawson 2013). This concerned a number of authors, making them emphasise the need for scientists to develop a stronger appreciation of how valuable it is to “connect” with an audience (Besley et al. 2014:215). Early training in communication is regarded as beneficial to young scientists, giving them a mindset that would enable them to be more confident about being involved in science communication (Trench and Miller 2012; Yeoman et al. 2011). Grand et al. (2015) argue that future efforts in science communication education should address resistance to engagement among scientists, seeking to gain institutional support in order to shift the culture and norms associated with public engagement within academia, as well as addressing the lack of formal evaluation of public engagement (Grand et al., 2015).

However, there is a suggestion that the situation is improving. Students are increasingly taking science communication training and their advisors encourage them to do so (Baram-Tsabari and Lewenstein 2017:296).

The growth of PhD research in science communication is regarded as a mark of science communication’s full emergence as a university subject and of the way that the subject has become more deeply rooted in the university system (Trench 2012:10).

Furthermore, the appeal of science communication is that it can prepare graduates for a wide diversity of careers due to the highly transferable skills it involves. Students are also increasingly working internationally. This can be seen as a positive outcome of the variety found across science communication education. A study about job placement of students from an Australian university showed that they were prepared to work in a wide variety of fields, due to the highly transferable skills that they had developed (McKinnom and Bryant 2017:191).

2.6: EDUCATION AND TRAINING OF MUSEUM PRACTITIONERS

Science centres and museums may be well positioned to play the role of more active agents in the broader effort to widen engagement with more diverse audiences. Indeed, extant literature often asserts the importance of museums as physical sites that allow visitors to develop their interests, knowledge and skills beyond academic contexts to actively engage and contribute their perspectives (Bevan & Xanthoudaki 2008).

Science centres are seen as building from academic understandings of effective practices and learning outcomes. However, extant literature on science communication suggests the importance of traditional approaches to education, often expressed as having dominant features. These features include extending
beyond “deficit perspectives” (Besley et al. 2016) and “one-way conveyance of information” (Tran et al. 2019). Often considered the default mode of communication, extant literature often points to one-way communication as being similar to traditional “explainer” or teaching approaches. In many ways, this ‘teaching’ approach appears no longer favoured in science museums (Diamond et al. 1987). Additionally, the ‘deficit’ model of communication is considered outdated in the field of science communication, but it might be useful when few other viable options are available (Trench 2008). These reflect broader shifts in museum practice from emphasis on “public understanding” (inferred as one-way) to “public engagement” (inferred as two-way); this is also discussed as moving from conveying “facts and information” in scientific subject matter, towards catalysing learning through “fruitful” interactions (Bevan & Xanthoudaki 2008: 109). Mediated approaches to science communication are often focused on within the idea of dialogue and participation, although such approaches are not always possible in practice.

These current dominant features in the extant literature on science communication also shed light on the requirements for professional development and capacity building for museum educators.

Achieving improvements in science communication has not been easy for museum professionals. Key challenges for professional development of museum educators mirror the broader literature throughout the past decade for contemporary science museum practice (see: Kelly 2004; Chittenden 2011; Bandelli & Konijn 2013; Dawson 2014), including the following:

- facilitating more public engagement opportunities to help shape science policies, research agendas, and governance structures;
- designing content around an understanding of interests, ideas and experiences from diverse audiences;
- engaging more broad and diverse publics;
- competing with information and communication technologies (ICTs) among young people.

Each of these shifts represent key challenges for professional development of museum educators. These broader trends and challenges, among others, have required museum practitioners to adapt by shifting their focus, strategies, and roles from an inward focus on, “collections” or “repositories” of curious objects for visitors to come see to an outward focus on educating visitors and developing meaningful relationships with communities in their working contexts (Bevan & Xanthoudaki 2008).

In this sense, changes in science museum practices may represent educational opportunities, but there has been substantial emphasis on how they engage with audiences effectively. The state of the art in science communication in museums centres around a number of key trends, building on a growing set of studies that point the way towards best practice or ‘quality’ (Patrick 2017; National Research Council 2009; Stockmayer et al. 2010), specifically: improving socially inclusive science communication in museums and inquiry-based approaches to science communication in museums. Indeed, ongoing professional development for museum educators and floor staff is necessary to inform these institutional practices.

Extant literature in science communication suggest alternative approaches towards professional development with an underpinning preference for prioritizing ‘reflection’ and ‘reflective thinking’ on museum practices. This notion builds from recognition that science communicators may experience difficulty when trying to move beyond how they were taught (Bevan & Xanthoudaki 2008). For example, these authors argue that science communicators will benefit by using “conceptualisations” of “ongoing, critical, and reflective learning that starts with and builds from the passion, diversity and strength of floor staff” (p. 110). Indeed, this argumentation has extended to how science communicators
should be trained as “active, reflective, responsive communicators,” thereby avoiding seeing the role of simply translating or disseminating scientific information (Wilkinson et al. 2009: 1). This, in turn, has been regarded as necessary for keeping audiences engaged, interested, and excited about a scientific topic, and maximising opportunities for science communication. In this regard, fostering the development of a critical or more reflective attitude towards science has permeated both into attitudes towards ‘educating’ the public and museum staff.

Following this earlier literature, Priest et al. (2018) continue this argument by suggesting that what is needed is ‘reflexive thinking’ about the broader consequences of actions. Tran et al. (2019) further suggest that a need to focus on the capacity of educators to deepen their understanding of practices in a meaningful way and clarify that “professional learning” is best considered “ongoing learning about one’s field of practice” (109). Additionally, this approach has been reframed as programme of professional learning called Reflecting on Practice (RoP) for educators in informal STEM learning environments (ISLE). The emphasis in this ‘programme’ is to shift efforts towards notions of community-based learning, where practitioners can “learn together, over time, at their own pace, and in an ongoing manner” (Tran et al. 2019).

Furthermore, authors clarify community-based learning as needing to be “self-led” from within the community of practice, rather than relying on outside experts to provide training or direction. In this regard, authors highlight community-based learning (CBL) as an effort to “collaboratively shape the language and meaning within the community” of practice by encouraging “continuous inquiry into practices” through “mechanisms of reflective practice” (Tran et al. 2019). This perspective extends further to the science communicators themselves as being able to gain a new perspective about their work from these interactions. For example, being asked questions a science communicator had not considered might help them see their work in a new way or from a wider context. Therefore, these authors make their assumptions clear that ‘reflection’ by itself may be capable of leading the community of practice to fundamental changes in thinking.

Authors suggest that time and resources spent on professional development should be questioned when museum staff are not stretched beyond these norms (Tran et al. 2019). One suggestion is that museum management can improve ‘return on investment’ to institutions by “paying less attention to simple, easily completed, time-bound tasks” (Tran et al. 2019). For example, one idea presented is of “management as teaching” whereby managers have a role in educating staff. This approach appears to connect the roles of “management as administrator” and suggests that being “educators” are preferable. However, these perspectives may be a problematic combination for practice if implemented uncritically.
SECTION 3: SCIENCE COMMUNICATION EDUCATION IN EUROPE: THE STAKEHOLDERS’ VIEW

In this section of the report, we outline key themes that emerged from interviews with stakeholders in science communication research and education and with science journalists and other experts in the field. We will also summarise results of the survey we submitted to EUPRIO associates, who work in public relations and communications offices in European universities and scientific organizations.

3.1 SCIENCE COMMUNICATION EDUCATION IN EUROPE

These semi-structured interviews with science communication teachers and scholars across Europe (n=16) involved questions about the contemporary landscape of teaching, research, and practice in Europe and in interviewees’ local contexts.

Most interviewees were or had been involved in teaching science communication in some way. The majority of their activities were focused on Masters level training programmes, while undergraduate teaching, further and professional development activities, and more extended PhD training were more unusual.

Some suggested that there had been recent growth in Masters programmes in science communication – an idea that is supported by academic literature (see, e.g., Trench 2012; 2017). Others noted that such programmes, and science communication education generally, also has a tendency to be somewhat ephemeral. As one interviewee noted:

“Things pop up and go away again. They may be quite based around individuals, and when those individuals move on, the initiative stops”.

There was also a sense from several interviewees that, in part because of the way in which science communication education emerge around particular individuals, support for science communication training was usually vulnerable (cf. Trench 2012; section 2.1). As with science communication projects generally, funding could also be an issue. One interviewee said, jokingly, that he had thought about making “kind of a graveyard of science communication projects where you map all the science communication projects that have received some initial funding for a couple of years and after the funding runs out then have become dormant or died”.

The relatively short-term nature of project funding is thus a challenge for practice as well as for academic activities in science communication. Programmes might therefore ‘pop up’ and go away again because
of staff changes, of problems recruiting students, or because an institution decided that the course was too expensive.

In the spreadsheet of education and training activities in Europe available in the QUEST data repository online, we highlighted in yellow courses or activities that are not currently ongoing, even if some of them previously seemed quite consolidated.

A further growth area mentioned was in science communication training for natural science PhD students. If science communication Masters programmes seek to equip students to become professional science communicators, then training for PhD students aims instead to produce natural scientists who are able (and willing) to communicate as part of an academic career. Such training – which may also include topics such as responsible research and innovation (RRI), patenting and intellectual property rights issues, or responsible conduct of research – is now mandatory in some countries. It goes hand in hand with increasing promotion of public engagement activities such as European Researchers’ Night and Pint of Science or contests such as ‘Dance Your PhD’, a ‘PhD cup’ or Fame Lab, where students compete to carry out the best science communication.

Generally speaking, there was a sense that university researchers at all levels were increasingly being encouraged to carry out science communication and public engagement: one French interviewee, for example, said that national research policy meant that all “academics [including herself], have now in their fiche de poste, in their professional profile, that they must communicate”. As we will discuss below, these developments certainly relate to training in science communication, but not necessarily in ways that are readily captured by examining formal programmes and courses.

Finally, it is worth noting that though very few interviewees mentioned non-university based training in science communication – perhaps because they were themselves largely based in research organisations – this certainly exists, albeit more so in some countries than others. One UK interviewee noted that “private companies”, which might combine “science communication consultancy” with “bespoke training, represent part of the landscape. In contexts where there is a particularly active and developed industry around science communication –UK and Germany perhaps being central examples – this overlaps with, and in part provides, science communication education.

3.1.1: Best practice in science communication teaching

In this sub-section, we review what interviewees said about best practice in science communication teaching, both with regard to content and to how it should be carried out. The focus here is on Masters level training, as this is what most interviewees were primarily familiar with.

First, it is important to note that – as emerged from the literature review in section 2 – interviewees suggested that production of knowledge in science communication and training came from a number of different traditions and used a number of different approaches. There was no commonly agreed way of teaching science communication. This diversity is particularly evident at the Masters level (and beyond), in that the faculties or departments that programmes were located in, and the disciplinary orientation of course leaders, were seen as structuring the ‘flavour’ or orientation of the teaching.

Flavour was, in fact, a key metaphor that interviewees used when describing the landscape of science communication education:

“The think in the Netherlands, [science communication Masters programmes] all have a rather different flavour, so here we are mostly aimed at like really the practical training of Science Communication
Quite a lot of institutions [in the UK] have set up Masters degrees, they tend to come and go a bit. And there’s two types that appear. One type is based in Centres for the History of Science [...] And then, the other type of course that appears, would be the initiative of the Science Department in a university. [...] that has quite a different flavour, because it hasn’t got the same sort of STS [science and technology studies] or history of science input”.

As it is evident from the quotes above, this diversity was not necessarily seen as negative. Rather, availability of courses from a variety of backgrounds and approaches made up a kind of national ecosystem, in which students could identify what was most suitable for them – a course with an emphasis on critical historical scholarship, on practical skills, or science journalism, for instance.

However, this diversity does mean that there were differences of opinion when it came to best practice in teaching science communication. Depending on the background of the interviewees, and the kind of programme they were associated with or knew best, they emphasised different things. Despite efforts in literature on science communication education (see section 2.2), finding a widely shared agreement on core elements of science communication curricula is likely to be challenging.

Having said this, there were a number of elements of good teaching practice that were mentioned several times and can therefore be considered common points to aim at.

First, many interviewees talked about the importance of practical experience, and of simply getting “practice” in doing science communication. This might mean developing programmes where specific practical skills were taught – for instance, using social media, learning how to write well, or visual aspects of science communication – so that students could access “a palette of different tools”. It could mean conveying more intangible aspects of what it means to be a good science communicator, such as learning to have “empathy with your audience” or to be a “creative practitioner”. But it also related to the way in which teaching was carried out. For some interviewees, it was important that students worked independently and professionally, for instance through coursework that involved carrying out practical projects ‘commissioned’ by university researchers. One interviewee noted that she felt that too much science communication teaching continued to be “based on traditional ways”, such as lecturing or assigning readings:

“We try to be practical, but I don’t think we are [...] I think that we need to include some other ways of teaching, like problem-based learning or anything where it’s the student who has to solve problems, has to learn by themselves”.

Second, several interviewees emphasised that teaching should foster the development of a critical or more reflective attitude towards science. For one science communication teacher, for instance, it was vital that students with a background in natural science stopped seeing themselves as scientists: science communication professionals, she said, “need to stop thinking like a scientist, and be able to critique science as well as critique its relationship with wider society”. Knowledge from humanities disciplines such as philosophy, history or STS is therefore essential in training students to develop critical distance towards, contextualise, and reflect upon scientific knowledge and practice. This related to a sense that science communicators play an important role in promoting democracy, and thus that students needed to learn to “ask the bigger question as to whose knowledge is it after all”.

Finally, as it has been implicit throughout this analysis, it was clear that much science communication teaching drew on multiple disciplines and types of knowledge. Science communication programmes were ‘mixed’, with an “integration of different disciplines, like science, communication studies, pedagogy, sociology, different areas”. Some teachers emphasised the importance of teaching scientific topics as well as those directly relating to communication, or bringing in lecturers from the practitioners’
world, such as journalists or activists. Even where courses had a strong orientation in a particular direction, such as history or practical skills, the content they provided was always interdisciplinary.

3.1.2: Science communication training as ‘artisanal’

Finally, another important theme from the stakeholder interviews relates to science communication education as an often small-scale, ad-hoc, or ‘artisanal’ practice. This highlights that, aside from the high profile Master courses the vast majority of teaching around science communication, particularly in the context of training natural scientists and undergraduate students, is “a little bit hidden” from outside view within other programmes or by going by other names. Such activities comprise:

“…the work that’s done by scientists within their own teaching programmes in chemistry or biology or whatever it happens to be, where they include an element of science communication. Sometimes naming the module as such, other times putting it in under interdisciplinary skills or transferrable skills or whatever. And that is, if you like, below the radar and it’s kind of a bit artisanal, you know, and I wouldn’t necessarily deprecate it on that ground”.

The artisan metaphor is useful not only in emphasising the ad-hoc nature of much science communication education, but its personal nature. As noted above, science communication teaching is frequently developed by particular individuals who have a passion for supporting public communication generally, and is vulnerable in that it is therefore dependent on them. “People come and go; they grow up and they grow on”, said one interviewee, and teaching activities may therefore ebb and flow accordingly.

This passion is itself framed as an important aspect of science communication generally, and thereby also of science communication teaching. Science communication is “a bit like art”, said one participant, and “for me personally, it’s a lot about making the world nicer”. Similarly, another interviewee framed pleasure as an important reason that scientists communicate, and as an element of science communication that removed it from purposes that are more instrumental. Paradoxically, she said, “the more you teach [scientists about communication] the less I think you can enjoy it”. Pleasurable science communication, in other words, may be spontaneous and ‘untrained’, rather than something that researchers can be educated into.

These framings of science communication training, which perhaps problematize some of what has gone before, raise a set of questions that may add a slightly different perspective to thinking about science communication education and training across Europe. For instance, to what extent is science communication a craft skill, learned through mentoring and hands-on experience? Does it matter that so much training is “below the radar”, hidden to scholarship? And, perhaps most significantly, how important is the wider culture of research in enabling or hindering scientists to become (part-time) communicators, and how might this culture be shifted to support European science communication generally?

3.2 SCIENCE JOURNALISM TRAINING IN EUROPE

Interviews with science journalism experts also suggest a fragmented and diverse picture with respect to training across Europe. As specialist science journalists, press officers or editors already working in the field, several interviewees did not know about training courses, or have enough exact details to be
able to describe them. If participants talked about courses, they tended to be in their own home country and they named particular courses that they had an association with, having undertaken the course, taught the course or been asked to speak to the students on the course. So, the data does not paint a complete picture of science journalism training in Europe, but provides a snapshot of the current science journalism training landscape.

A few common threads emerged from the interview data:

- **Science communication courses were conflated with science journalism courses.** Sometimes interviewees described science journalism being covered as part of a more general science communication course, or integrated into generic journalism training, perhaps as a specialist science journalism module.

- Interviewees reported **more science communication courses than science journalism courses** - some interviewees referred to this as mirroring the ratio of science communicators to science journalists. This point was confirmed by our web search, which showed about 60% of activities as more general science communication and less than 20% clearly focused on science journalism.

- Though interviewees frequently talked about an increase in number of courses or training opportunities in science communication over the last few decades, 3 interviewees (in Ireland, Norway and the UK) mentioned **specific science journalism training being removed from the curriculum, or science journalism courses failing to attract interest.** Several interviewees mentioned a different picture in the USA, where there were a number of specific science journalism degree courses. This mirrors the instability we described in science communication courses in Europe. It may also indicate that there are diminishing opportunities for science journalists – certainly as staff position.

- In some cases older journalists mentioned there was no training when they were starting out in journalism – they trained ‘on the job’ – , although interviewees generally felt that **specific science journalism training would be useful** as it is an area of journalism with its own issues and challenges.

- More **informal training** was also mentioned – for example science PR organisations meeting with editors to advise them about science journalism; informal internships or tours of newsrooms for students; very short courses (e.g. half a day) in science methods e.g. statistics or background to AI, offered by industry or science PR organisations.

- Interviewees also mentioned **short (e.g. 2 or 3 day) courses or summer schools** in science journalism run by higher education institutions.

- One interviewee mentioned the **cost of science journalism degrees and training** - feeling that this could prevent those without independent financial backing entering the profession. Traineeships in the field run by news organisations would be a way to counter this problem.
3.3 SCIENCE COMMUNICATION EDUCATION FOR MUSEUMS

According to our interviews to experts in science museums, learning activities should be engaging and built from available social capital from within the field of practice for professional development. Often unspoken, however, are conflicts between museum management and educational priorities, which may arise as financial concerns pressure educators to also consider ways to bring in money and do things to help the institution survive. In this way, those managing the business of science institutions may be more directed by financial considerations than effectiveness of communications that are achieved.

Indeed, despite mission and aims of their organisation clearly including science communication, most participants indicated difficulty in manifesting plans for ensuring quality science communication in their activities. Due to the relatively short-term nature of project funding was a challenge for improving practice, as well as changing activities or engagement practices to include more audiences in science communication. Having plans to achieve their quality standards was important for institutions to focus their resources and efforts.

Not having enough funding was seen as a common barrier that prevented development of new methods or tools, particularly in impact evaluation, which can already be seen as too specialised, complex or expensive for most institutions. For these reasons, participants wanted to see further research about sources of funding, particularly governmental, on science communication in Europe. This reflects a number of key challenges for capacity building and professional development reported by participants in how to find balance between these other priorities in science communication: there is pressure to be engaging, inclusive, relevant and scientifically accurate while there is also pressure to conserve resources and increase funding. Because these pressures often converge by producing a lack in internal knowledge, the tool most advocated for in the field of reflective practice may, in actuality, be less about improving practice and more of an institutionalised coping response to having perpetual limitations in resources.

3.4 SCIENCE COMMUNICATION EDUCATION WITHIN EUROPEAN UNIVERSITIES AND RESEARCH CENTRES

EUPRIO is the association of European Universities Public Relations and Information Officers, now renamed the European Association of Communication Professionals in Higher Education. Its associates have a crucial role in institutional communication and in putting researchers in contact with the media, including providing them with training for this purpose. Therefore, they are in a privileged situation to describe points of strength, educational needs, and challenges.

As one of the QUEST project’s stakeholders, EUPRIO circulated a survey about science communication education in European universities and research centres to its members. The survey asked communicators about the state-of-art and their perceptions of both their own and researchers’ needs in training for science communication.

We gathered answers from 48 communicators from 40 universities or scientific organizations in 16 European countries.

More than half of them feel well equipped for traditional activities such as media relations, dealing with interviews and writing for the lay public. In the same areas, they think researchers, on the contrary, need more training: no interviewees said that researchers do not need education in media relations and...
dealing with interviews, while almost 9 out of 10 think they have substantial or high need for it. With regard to writing for the public, few communicators do not see any need for researchers, while almost 7 out of 10 think researchers have substantial or high need for it.

The area in which the highest proportion of interviewees reported feeling a significant or high need for training, both for themselves and even more for researchers, is **visual communication**, followed by learning different approaches within science communication and public speaking. Strategic and risk communication are other weak points, in which only some communicators feel no or little need for education for themselves and for researchers.

When dealing with policymakers, the great majority of interviewees feels need for training researchers and more than one third sees a significant or high need for themselves.

Based on respondents’ knowledge, about half of their **organizations provide courses or short training** in public speaking, dealing with the media (and specifically with interviews), but only few prepare their researchers in visual, strategic or risk communication.

When asked about cooperation among their and other universities & research institutions for education or training, only 7 persons answered that they were informed about initiatives of this kind.

### 3.5 TRAINING AND EDUCATION ABOUT AND THROUGH SOCIAL MEDIA

Social media such as Facebook, Twitter, Youtube and Instagram have achieved a crucial role as a source of information for citizens. Science communication, like other sectors, therefore has to tackle the challenge of tools that are very different from traditional, mainstream media, such as journals, newspapers, radio and TV播送. Many researchers are still afraid of these «new» media and of their interactive characteristics, which pull them out of their so-called «ivory tower» of either peer-to-peer or top-down communication (Nature Cell Biology, 2018). Therefore, they need specific training to be helped to enter these arenas.

Also, institutional communicators are still not very familiar with social media. Almost 40% of the EUPRIO interviewees in our survey acknowledge the need for some training themselves, and as many believe they have significant or high need of this kind of education.

Even greater, in their opinion, is the lack of knowledge and confidence in this field among researchers: most of the respondents think that scientists have significant or high need to improve their use of social media.

As a response to this, some institutions are introducing specific trainings on social media among the offering for their researchers, as arose from the survey, where almost half of the respondents stated to be aware of some courses on social media use for science communication in their institutions.

Finally, social media are **not only tools for science communication, in which training is needed, but can also represent an innovative approach to science communication education and training**, especially on YouTube. It is clear that there are many online training resources for both communication generally and science communication specifically (one example being: «Talking science: an introduction to science communication» by Greg Foot, a science presenter on BBC TV and radio).
SECTION 4: MAPPING SCIENCE COMMUNICATION TEACHING ACROSS EUROPE

4.1 KEY SITES AND CENTRES ACCORDING TO EXPERT INTERVIEWS

Based on interviews with teachers and scholars of science communication, when it comes to how education in science communication maps across Europe, there are at least two dynamics at play.

On the one hand, we have a sense of ubiquity with a multitude of small-scale courses and training activities for researchers in many European universities. “In every single European country”, said one German interviewee:

“at least if we look here at the European Union, we have things like science communication courses. But these are usually single courses, one semester or whatever, and it is just an add on, it is not that it leads to a certain degree in science communication, or whatever. It’s just a single course on this level. We have a lot of offers, and it’s really hard to oversee how many offers there are”.

We can see from the NTNU case study (see box 1) the extent to which this is the case: a single university may offer multiple short courses in science communication, to students at different levels, taught by either academics or practitioners – and teachers and course coordinators within the same institution may be unaware of each other’s activities.

As the interviewee quoted above notes, mapping such provision is an almost impossible task.

On the other hand, when it comes to training aimed at preparing professional science communicators, specifically through Masters- degree programmes, it is clear that there is a relatively small number of very well established centres throughout Europe.

The oldest Masters programmes are based at SISSA (the International School for Advanced Studies) in Trieste, Italy; Imperial College London in the UK; the University of Pompeu Fabra in Barcelona, Spain; Dublin City University in Ireland; the Université Paris Diderot (Paris VII) in France; the University of the West of England in Bristol, UK; and TU Delft, in the Netherlands. A more recent, but already well established and influential, Bachelors programme runs at Rhine-Waal University of Applied Sciences in Kleve, Germany. As our web search showed, these are not the only programmes in science communication – most European countries now have several – but they are the best known, at least to our interviewees and in academic literature.

As far as education in science journalism is concerned, in addition to those mentioned before, Karlsruhe University of Applied Science and especially Dortmund University in Germany were named as sites with complete programmes, from Bachelors to Masters. Cardiff and Sheffield Universities in the UK offer renowned masters in science communication, but in cooperation with schools of journalism, or focused on writing for the media.
Similarly, there is a specifically journalistic focus in the masters at the Ecole Superieure de Journalisme de Lille in France, at Università La Sapienza in Rome, the course on «Science and the Media» at the Oslo Metropolitan University and that on «Communicating Science» at the Norwegian Institute of Journalism, in Norway.

Beyond these key sites, it is worth briefly noting two other ways that the distribution of formal science communication education is patterned.

First, one surprising gap in provision is in Scandinavia, where we could identify (and interviewees confirmed was the case) no full Masters programmes specifically devoted to science communication in general. There are, however, researchers active in the field in these countries, confirming that research and teaching are not always co-located (as one interviewee noted, of the better established Masters programmes, at least some “are mainly teaching” rather than being in research active centres).

Second, both German and English language zones are particularly rich in (current) science communication training provision, though this tends to be somewhat differently oriented, with German-language science communication – Wissenschaftskommunikation – training at the Master level often being oriented to communication studies and/or sociology, while in the UK teaching may be in natural science faculties and involve a more multi-disciplinary approach.

4.2 SCIENCE COMMUNICATION EDUCATION AND TRAINING IN EUROPE: A MAP

Starting from the inputs from the experts, we widened the mapping through a web search. We began exploring online existing resources, such as http://www.scicommfinder.info/, https://www.mastersportal.com/, https://www.master-and-more.eu/en/find-your-masters/, https://www.masterstudies.com/Masters-Degree/, https://www.findamasters.com/, https://www.mastersavenue.com/, articles, blog posts, websites of European organizations and associations of journalists and communicators, and the European Guide to Science Journalism Training.

After that, since many of these resources were out of date, we combined the results with Google searches for keywords: “science communication” AND “training” AND “education” AND/OR “science journalism” AND/OR “science museums” AND/OR “school of journalism”.

After excluding items referred to communication science or journalism not focused on science, and research or science communication centres without training activities, we identified 108 educational and training activities in science communication in 18 countries in Europe, plus 3 at the international European level, as represented in the map below (the interactive version is available on QUEST website).
Figure 1: Map of the courses in science communication identified in Europe (the dataset is available in the open access QUEST data repository).

The countries where the first science communication Masters programs were opened are still those with the greatest number of activities: the first is UK with 24 courses or training activities in 17 different centres, followed by France with 14 activities, Italy with 13, Netherland with 11, Germany with 7 and Spain with 6.

This ranking has quantitative and qualitative limitations, since we cannot be sure of having identified all the activities, especially in languages other than English, and we also did not consider the number of students in each course, or its importance. These data should therefore be seen as an indicator of interest and internationally open initiatives in the field.
In addition to these, there are some international initiatives, like the SciDev.net online courses for science journalists and the residential courses and workshops organized by ECSITE, the European network of science centres and museums, before their conferences.

Based in UK, but addressed to scientists all over the world, we found also the online courses, webinars and workshops provided by Nature Research Partnership, some of which are focused on science communication.

We also found a few examples of cooperation among different centres in different countries. For instance, ITMO masters students in Saint Petersburg are offered international internships and can participate in exchange programs at the Rhine-Waal University of Applied Sciences.

In this context the case of ESST (European Inter-University Association on Society, Science and Technology), which joins 13 participating universities across Europe, is relevant. It provides a European Master’s Programme on Society, Science and Technology characterized by a strong interdisciplinary approach, for which students have the opportunity to initiate their studies at one university and then follow a specialization and write their thesis at another.

As far as levels of academic courses are concerned, a bachelor programme in science communication in Europe can only be carried out in Germany:

- at Rhine-Waal University of Applied science, in Science communication and bionics;
- at Karlsruhe University of Applied Science, in Communication and Media management with a special focus on science;
- at TU Dortmund University in Science Journalism.

Other BA programs are more focused on science education for teaching in school (Irish, French or Dutch universities) or join art and science (UCL, London).
We have identified 8 single courses in science communication within other academic programmes, 4 consolidated continuous professional development (CPD) activities (for scientists, journalists and teachers), 11 add-on programs within universities (one, at Politecnico di Milano, also for administrative staff) and 15 consolidated non-academic training activities performed by science museums, research institutions, private organizations or professional associations.

There are many other sporadic science communication training and CPD activities in most European countries, organized from time to time by universities, associations, organizations, private companies, either for profit or non-profit, as short courses over one or few days or weekends, or summer schools, but because of their discontinuity these are difficult to track. We decided therefore to leave them out, and have included only current and ongoing activities as of Autumn 2019.

Going back to academia, we counted only 4 PhD formal programmes in science communication:

- Two are in Austria, one at the university of Wien, more focused on STS, and one at University of Klagenfurt, on Health, Science, and Social Responsibility Communication and Management;
- One in Valencia, Spain, is about history of science and science communication;
- One in Edinburgh, UK, is characterised by a practical approach, thanks to lasting partnerships with Edinburgh International Science Festival, National Museums Scotland, Edinburgh Zoo National Galleries Scotland, Our Dynamic Earth and Edinburgh International Festival and Fringe.

We also identified 75 Masters programmes, all of which are highly diverse in terms of:

- **Content, target and academic context:** 5 with focused interest on activity in museums, 5 specifically aimed at science teachers in school (in French, Irish ad Dutch universities); 13 in STS studies, 16 on science journalism and 52 in general on science communication (which often prepare students also for museum activities and science journalism though);
- **Duration** (usually from 2 to 4 semesters in 1 to 2 academic years, often for full time or part time programs, respectively. Some part-time, online courses can last up to 3 academic years)
- **Format** (full or part-time residential programs, 7 semi-virtual or totally online programmes);
- **Fees** (from free, such as in Germany, to highly expensive, with almost 30,000 euro for overseas students in full-time programs in some UK universities).

![Focus topic of EU masters](image)

Figure 2 Almost 60% of the activities are about science communication as a whole.
Some masters have focused content:

- **on art and science** ([University of the Arts](https://www.arts.ac.uk), London),
- **on environmental, sustainability and climate change issues** ([MACSIS](https://www.macsis.org), Milan, Italy; [Jönköping University](https://www.ju.se) and [Swedish University of Agricultural science](https://www.su.se) in Uppsala, Sweden; [University of Lincoln](https://www.lincoln.ac.uk), UK; [Dublin City University](https://www.dcu.ie), Ireland; [Université Aix Marseille](https://www.univ-amu.fr), France);
- **on medicine and health communication** ([ITMO](https://www.itmo.ru), Russia; [University of Edinburgh](https://www.ed.ac.uk), UK; [University Pompeu Fabra](https://www.upf.edu), Barcelona, UK; [University of Erfurt](https://www.uni-erfurt.de), Germany; [Wageningen University](https://www.wur.nl), Netherland; [Dublin City University](https://www.dcu.ie), Ireland; [Università della Svizzera italiana](http://www.unisvita.it), Institute of Communication and Health (ICH).

Especially when dealing with medicine, some programmes (ICH, Université Aix Marseille, Erfurt) aim at providing professionals mainly for pharma companies corporate or health promotion institutional communication.

Our web search identified also some courses with particular attention to **training for science museum activities**, such as masters at the [Université Grenoble Alps](https://www.universite-grenoble-alpes.fr), the [Universidade de Lisboa](https://www.ulisboa.pt) in Portugal, the [University of Leeds](https://www.leeds.ac.uk) in UK and [Eötvös Loránd University](https://www.elte.hu) (ELTE), in Budapest, Hungary.

Out of an academic context, some science museums, such as [Vienna Biocenter](https://www.biocenter.ac.at) and [London Science Museum](https://www.sciencemuseum.org.uk), also provide training and workshops for teachers and science communicators.

### 4.3 CASE STUDIES

In this sub-section, we will analyse some case studies, representative of the diversity of science communication activities described in the map. Again, they are just examples, and cannot draw a complete landscape of the field.

**Case study 1: University training for scientists: Science communication at NTNU**

In common with other Scandinavian universities (see section 3.1), there is no full degree programme in science communication at NTNU (the Norwegian University of Science and Technology). However, there are at least two courses for PhD students relevant to science communication training: one, run by the Humanities Faculty, and titled ‘Communicating Science in Journals and to the General Public’ runs over four days and includes one day of practical and theoretical content about public communication. Other content explores academic and user-oriented writing. The other, ‘Communication of Science’ is run by the Medical and Health Faculty, runs over three days, and features one day focused on public communication. The rest of the course explores issues of ethics and good research conduct. The courses are staffed by different individuals and run in parallel, with no interaction between them. Both have academic course leaders (from linguistics and public health respectively) but feature guest lectures from communications practitioners.
Case study 2: Science communication-focused university centres: The University of the West of England (UWE)

The Science Communication Unit at UWE is part of the Faculty of Health and Applied Sciences. It is a well established teaching centre for science communication with eight faculty members as well as support and research staff, running a number of programmes including a one year masters. It also has a significant online presence, with a Postgraduate Diploma in Applied Science Communication offered entirely online over a two-year period, and a number of shorter courses aimed at practitioners. Content in all of these courses merges background theory with practical skills and activities. The Unit has a strong history in gaining its own projects in science communication practice and evaluation.

Case study 3: Private provision: Science Made Simple

Science Made Simple is a UK science communication consultancy. Its main focus is bringing “inspirational science, engineering and maths shows to your school, event or festival” but the group also offers training courses, evaluation, and research. They provide a number of standardised workshops to universities or other groups (from learned institutions to museums) as well as offering more bespoke services. The emphasis is on practical skills and on short, bite-sized training sessions.

Case study 4: A well established master programme: The Master in Comunicazione della Scienza “Franco Prattico” at SISSA

The Masters programme provided by SISSA, Trieste, is one of the oldest in Europe, having been running for more than 25 years (since 1993). As of the academic year 2019-2020, it has concentrated its more than 500 hours of lessons in 1-year full-time attendance, instead of the 2 years that characterized it in the past. It provides students with an interdisciplinary teaching, which includes STS basics, science journalism, multimedia activity, social media, corporate and institutional communication, entrepreneurial journalism, museums, book publishing, visual & graphic design. During the master, students attend stages at workplaces where half of them keep on working at the end of the programme. This placement is mainly in journalism, followed by institutional communication or press offices. Others find job either in the publishing industry, or in activities of education and popularization, but many other possible outputs are mentioned in a survey of alumni who have gotten their master degrees in the last 20 years.
SECTION 5: CONCLUSION

This report wants to present an overview of science communication education and training across Europe, without the ambition to provide a complete map of the all existing offer. Indeed, one of the key findings of this deliverable is that much activity around supporting science communication goes ‘under the radar’. While we have been able to identify key sites and programmes in Europe (principally for postgraduate training in science communication), our mapping should certainly not be seen as comprehensive. Instead, we have identified a number of important trends and tensions that are relevant to policy on science communication and to those who teach or otherwise support it.

We briefly detail these take-home points below.

- From a small nucleus of consolidated, “historical” activities, many initiatives of education and training in science communication spread to most European countries, even if UK, Italy, France, Netherland, Germany and Spain still lead for number of activities and masters.

- In addition to those described in this work, many other sporadic activities couldn’t be mapped, but play a relevant role in science communication landscape in Europe.

- The academic literature, the interviews and the web search map a landscape of science communication education in Europe, which is highly diverse. It is cross-disciplinary in nature and may mobilise quite different conceptual traditions. This means that there is little agreement concerning the core concepts and skills that should be taught.

- Few themes did emerge concerning best practices in science communication training: science communication education often involves training in practical skills, such as understanding audiences, learning how to use social media, or crafting clear messages, but communicators (whether scientists or professionals) should also develop a reflective attitude towards science and society and take a dialogic rather than didactic approach. This was, at times, framed as a move away from a ‘deficit model’ of the public and of communication.

- Finally, a key lacuna in our mapping is privatised provision of science communication training. Understanding how non-university actors teach science communication should be a central focus for future research.
REFERENCES


Carver, R.B. (2014) Public communication from research institutes: is it science communication or public relations? SISSA – International School for Advanced Studies Journal of Science Communication ISSN 1824 – 2049


Mellor, F. (2013) Twenty years of teaching science communication: A case study of Imperial College’s Master’s programme. Public Understanding of Science 22(8) 916 –926


https://www.youtube.com/playlist?list=PLD160RWuGai9oUnAVRq-GD2njEo1XHadF
https://www.youtube.com/playlist?list=PLD160RWuGai9oUnAVRq-GD2njEo1XHadF
https://www.youtube.com/watch?v=CndVeN-yAaw
https://www.youtube.com/watch?v=D8jEsfFTQzU