SciShops

ENHANCING THE RESPONSIBLE AND SUSTAINABLE EXPANSION OF THE SCIENCE SHOPS ECOSYSTEM IN EUROPE

D4.5

Strategy for participatory research in communities and capacity building of existing Science Shops

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Executive summary

This report presents a comprehensive strategy for participatory research in communities and capacity building of existing Science Shops. The purpose of this strategy is to provide a vision and guidance to assist the future development of Science Shops. The strategy is designed to help Science Shops engage in 'transformative' Community Based Participatory Research (CBPR), i.e. implement projects on behalf, and with CSOs, that inspire and enable changes or result in new perspectives on the issues under investigation. The strategy identifies concrete ways to establish and develop Science Shops with transformative potential by describing priorities, objectives and actions for strengthening knowledge exchange between Science Shops and society, and supporting the capacity building of Science Shops.

Based on the results of previous analyses carried out in various work packages of the Horizon 2020 SciShops project, in which the challenges to CBPR and Science Shops have been identified, a vision and a mission statement have been developed. The most difficult challenges of initiating or developing a Science Shop can be broadly summarised as: engaging and involving civil society; finding a sustainable model in terms of funding and staffing; and assessing the impact of CBPR. Subsequently, a **Science Shop's vision** is to be recognised as providing transformative CBPR in response to concerns experienced by civil society. **The mission statement** focuses on three main aspects: to develop, maintain and manage the Science Shop in an adaptive, efficient and sustainable manner; to ensure the co-creation, integration and spread of knowledge in the civil society; and to encourage cooperation with private, public, profit and non-profit bodies both to boost the society awareness about a certain topic and to implement research-based actions. Priorities and strategic objectives are then outlined, together with actions and suggested key performance indicators. Three priorities (P1–P3) and ten strategic objectives (O1–O10) make up the core of the comprehensive strategy presented in this report:

P1: Communities' engagement
O1 Spread knowledge about Science Shops
O2 Enhance involvement of CSOs and other stakeholders
O3 Promote partnerships with public institutions and authorities
P2: Networking and twinning among Science Shops
O4 Standardise project dataset for networking
O5 Promote networking and matchmaking at national and international level
O6 Learn from the experience of existing Science Shops (twinning)
P3: Sustainability
O7 Shape your business model
O8 Secure funding
O9 Increase and demonstrate the impact
O10 Increase recognition for CBPR in academia

Actions and corresponding key performance indicators suggested for each objective are not exhaustive but provide an initial framework that can be improved on the basis of the monitoring and impact assessment results. To support the implementation of the strategy, useful resources provided by other tasks within the Scishops project or by other projects or initiatives are also included.

The strategy is designed primarily for Science Shop coordinators or coordinating staff, but may also be of interest to CSOs and other individuals interested in CPBR.

Acronyms

CBPR	Community Based Participatory Research
EC	European Commission
EU	European Union
NGOs	Non-Governmental Organisations
NPOs	Non-Profit Organisations
RRI	Responsible Research and Innovation
SMEs	Small and Medium Enterprises

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1. Introduction

1.1. Overview and structure of the document

SciShops.eu (Enhancing the Responsible and Sustainable Expansion of the Science Shops Ecosystem in Europe) is a Horizon 2020 project involving 18 partners in 12 European countries aimed at promoting the growth of socially responsible community-based research in Europe. The project explores how different types of research organisations, such as research institutes, large enterprises, SMEs, NPOs and universities can develop sustainable Science Shops with the ambition of establishing ten new Science Shops during the course of the 30-month project. The project runs from September 2017 to February 2020.

This deliverable (D4.5) is the last piece of the mosaic built in Work Package 4 and is focused on the development of a strategy for community-based participatory research and knowledge transfer from Science Shops to civil society. The report uses knowledge accumulated in the previous SciShops deliverables, especially those developed in Work Package 4, which provide detailed practical guidance on establishing and running community-based participatory research (CBPR) initiatives, which Science Shops aim to be. This deliverable builds upon and summarises the results of previous deliverables by providing a strategic vision for participatory research in communities and capacity building of existing Science Shops.

The purpose of this strategy is to provide a vision and guidance for the future development of Science Shops. The strategy should help Science Shops engage in 'transformative' CBPR, i.e. implement projects on behalf, and with CSOs, that inspire and enable changes or result in new perspectives on the issues under investigation. The strategy identifies concrete ways to establish and develop Science Shops with transformative potential by describing priorities, objectives and actions for strengthening knowledge exchange between Science Shops and society, and supporting the capacity building of Science Shops.

The strategy first gives a brief overview of the context in which Science Shops operate (Ch. 1, Section 2). It then presents a state of the art analysis, which identifies the key challenges that Science Shop face (Ch. 2). This analysis forms the foundation for the vision and mission statements of Science Shops (Ch. 3). Further, these statements are translated into concrete priorities and objectives that can be pursued through actions with key performance indicators (Ch. 4). Finally, the strategy presents resources that might be useful for implementing the actions (Ch. 5).

The report is expected to be used by organisations planning to start a Science Shop or that are already running one, and will be of most relevance to the potential coordinator or coordinating team. It might also be of use to CSOs thinking of collaborating with a Science Shop, or even to individuals interested in learning more about the concept of CBPR and Science Shops.

1.2. Context

This section focuses on the evolution of the socio-economic-political context in which Science Shops are currently operating and anticipated changes in the future.

Since the first Science Shops were established in the 1970s (see Box 1) the external environment has changed and brought about new conditions affecting their development and success. When discussing

the external conditions for Science Shops, it is important to take into consideration aspects such as EU policies on research and science, trends in data use and regulation, as well as public opinion on science.

The EU conditions are not so much changing as shifting gradually in terms of priorities. On the one hand, among the priorities that remain are RRI (Responsible Research and Innovation), which has been guiding research in the EU for some time. This policy applies more widely to all research, since the policy is aimed at ensuring the inputs of citizens into the process of generating knowledge and producing innovation such that these serve societal – and in some cases specifically European – aims. On the other hand, the RRI policy applies to Science Shops in particular, since the aim of Science Shops is to respond to societal needs, by engaging society itself in the research process.

At the same time, the EU is increasingly shifting towards a policy of open science or open research. One part of open science where the EU has taken a lead is in making publications, and to a lesser extent data, more widely accessible to the public. Open access journal publishing is also increasingly becoming the norm, though there are still significant barriers to extending this policy to all fields or disciplines, and it is also unclear if the resources for this model are adequate. Open data access is a more recent area, and there are a number of organisations promoting data sharing (such as Open Knowledge International). These will increasingly become a resource for Science Shops, and open access is already practised by many Science Shops, but the practice of data sharing is also currently in a state of flux.

One of the reasons for this state of flux is because gathering data about people from digital media, for example, has been subject to a number of scandals and challenges. A more general shift related to this is that the public is increasingly aware of being part of research, and wants to be recognised as such – or, in some cases, have more options about how to participate, if at all, and to receive recognition for this participation. This shift ties to recent societal debates about the role of data, which the public has been much more aware of. The recent policy implementation of General Data Protection Regulation (GDPR), while it goes a long way to address some of these challenges, is still in early days of implementation, and so it is not clear yet how it will affect Science Shops.

There is also growing distrust of science (or the deliberate creation of uncertainty about science, for example in relation to climate change) and at the same time a weakening of trust in experts (with the rise of populists, who are often inclined to scepticism about science). Among the public, it is clear that there is not a high level of awareness of Science Shops, except perhaps in Western Europe and in the areas of social sciences in particular (as documented in the SciShops project, specifically in Bergman et al.,2018). Further, resources for research are becoming more constrained generally, and this project has also identified lack of sustained funding as one of the key obstacles to the success of Science Shops.

The obvious counterweight to some of these challenges for Science Shops could be providing more information resources and also more dialogue between science and citizens or stakeholders. How these are implemented in detail, however, will be the subject of the following sections. Perhaps the greatest challenge for those interested in pursuing Science Shops and counteracting or coping with the external tendencies in society that have been described is to access the appropriate resources, of which there are many. The following sections will go some way to providing these resources. Further, there are also internet resources and specific databases that provide access to materials about Science Shops, including as part of the Science Shops project and also elsewhere, and these will also be detailed further.

BOX 1. A bit of history: the four 'waves' of Science Shops

In Europe, Science Shops were established in four "waves" (based on History of Science Shops at www.livingknowledge.org; Mulder et al. 2001; Fischer, Leydesdorff, and Schophaus 2004)

First wave

The first Science Shop was established in the Netherlands in the 1970s. Its establishment coincided with the emergence of project-based education in universities and an emerging environmental awareness in society. By the early 80s, all Dutch universities had one or more Science Shops, serving many scientific disciplines.

Second wave

Since the founding of the first Science Shop in the Netherlands, the concept spread throughout Western Europe and Science Shops evolved in Germany, France, Denmark and Belgium. In the 1980s there were as many as 15 Science Shops in France. They were initiated by scientists who had learned about the Dutch Science Shops (however, none of the French ones are in existence now). In Germany and Austria Science Shops were also established based on the Dutch example, both as independent (NGO) Science Shops and as university-based Science Shops.

Third wave

During the 1990s the concept of Science Shops received renewed interest by policy makers, especially by the European Commission. Several projects on Science Shops were funded by the EU and new Science Shops were established in Spain and the UK.

Fourth wave

From 1995 new Science Shops begin to be established in the Middle and East-Europe, mostly modelled after the Dutch example.

Nowadays we can find active Science Shops or organisations with similar missions throughout the world in, for example, Israel, Romania, Lithuania, Latvia, Poland, Belgium, Denmark, Spain, United Kingdom, South Africa, USA, Canada, South Korea.

For the future, new models of Science Shops are being fostered by the European Commission by providing funds for developing strategies to expand the Science Shop ecosystem. SciShops and Inspires are two projects funded recently by the EC in this specific topic. SciShops (www.scishops.eu) is introducing companies as founding actors and favouring networking of new Science Shops and their twinning with existing ones. Inspires (www.inspiresproject.eu) is focusing on the health and environmental sectors, and societal challenges that affect the world population, giving special attention to gender parity and vulnerable groups (women, the elderly, adolescents, migrants and refugees). To reach the goal, InSPIRES has been analysing potentials of Science Shops including transformative ambitions, impacts and social innovation (Balàzs and Gresle, 2018). It is still too early though to say if the tasks carried out by these two projects will trigger the formation of a '*fifth wave*', or if it will turn out to be only a ripple in Science Shops ecosystem.

2. Where are we now? The current state of play of the Science Shop ecosystem

Science Shops nowadays can be found all over Europe, as well as in Canada, the USA, Australia, and New Zealand (see Jung and Kleibrink, 2018). Recent initiatives, such as the Inspires project, have also started to experiment with the concept in Bolivia and Tunisia.

The success of Science Shops is due to a number of distinct benefits to civil society, policy makers and the academic community. They comprise a practical expression of RRI by involving all stakeholders in the research process and addressing questions that are most relevant to the public. Moreover, they contribute to the democratisation of academic research by providing a transparent research process and making the results publicly available. They also have the potential to renew interest and trust in scientific research. Science Shops typically involve students and/or volunteers in the research process. This leads to a win-win situation for all parties involved: students/volunteers get hands-on research experience, universities can contribute to society in a meaningful way, and civil society organisations (CSOs) get access to research for free or a very low cost.

Yet, contemporary Science Shops also face a number of challenges and risks that need to be acknowledged in order to provide an adequate future strategy for community engagement and capacity building. The deliverables developed to date within the SciShops project have highlighted a number of potential difficulties that are often faced by new or established Science Shops. These challenges can be broadly classified into the following categories: funding, community engagement, staffing, and impact assessment.

2.1. Funding

Financial sustainability is probably the most salient issue for Science Shops around the world. Finding sustainable long-term funding sources can be a major challenge. The most common sources of funding are funding from the mother organisation and project funding. Whereas the first source of funding is probably the most stable one, in most cases the Science Shop will only receive partial funding and will not be able to operate and decide on financial matters independent of the mother organisation. Project funding, on the other hand, can provide a high level of certainty but only for a limited period of time. In addition, applying for project funding can be very time-consuming, while these grants are often highly competitive.

Project funding opportunities are also dependent on the broader economic conditions. In times of austerity measures and budget cuts, the number of project grants can be limited. In light of these challenges most Science Shops have opted to diversify their sources of income by supplementing the above-mentioned options with a number of alternatives, including: paid services, membership fees, revenue from publishing, charitable grants, and social entrepreneurship.

The operating costs of the Science Shop can be a second potential financial difficulty for Science Shops. Research projects can be expensive in terms of the required equipment and resources. Science Shops that are based at universities often have access to the elaborate infrastructure of the university (labs, libraries, venues, etc.). However, this can be more difficult or more expensive for independent Science Shops.

2.2. Community engagement

A second key challenge for Science Shops is the (continued) engagement of civil society. First and foremost, it can be very difficult to reach civil society for a newly established Science Shop. Organisations may not be aware of the Science Shop concept, its potential benefits, or the existence of the new Science Shop in their vicinity. Therefore, it is crucial to spend a lot of time and effort on outreach and communication activities in these initial stages. Moreover, it can be difficult to mobilise civil society in certain cultural contexts. This is especially the case in countries where civil society is historically under-developed such as Eastern European countries. In these cases, it can be quite difficult to reach civil society organisations and receive sufficient research questions from them.

A Science Shop can also be limited in the type of research questions it can answer. Aside from the university-wide ones, most Science Shops have a clear thematic focus due to the expertise of the Science Shop staff. A highly specialised Science Shop can therefore only accommodate very specific topics that might not always match the research questions of the community. In these cases, it can be quite difficult to match the research question to particular researchers and students, leading to unanswered questions in the community.

A third challenge related to civil society is managing the expectations of all the stakeholders in the research project. Whereas the involvement of all stakeholders of the research project is one of the absolute strengths of the Science Shop methodology, conflicting interests of the involved partners may force the Science Shop to make certain decisions that might not be supported by all involved parties.

Finally, one of the trickiest challenges is the involvement of civil society or CSOs in the research process, which is at the heart of CBPR. Receiving research requests is actually only the first step of participatory research. Effective involvement of the CSO in the development of the projects is a crucial task, which could be quite difficult, depending on the socio-cultural setting of the Science Shop.

2.3. Staffing

There are a number of potential difficulties associated with staffing a Science Shop. Due to the limited budget of most Science Shops, many depend to a certain extent on the voluntary commitment of staff, both in terms of supervising research projects and in their implementation. At universities, the supervision of research projects usually happens by academic staff on a voluntary basis. Yet, the academic sector currently does not provide sufficient incentives for getting involved in this type of activities. For example, career opportunities in academia depend mostly on the number of publications in prestigious journals, rather than contributions to the community. This context is not conducive to the involvement of researchers in CBPR, and Science Shops in particular.

On the other hand, the majority of Science Shops engage volunteers, students and interns in the implementation of research projects. Using volunteers and students can also present some risks in terms of quality assurance, due to a lack of research experience, and commitment, due to a lack of time or students dropping out of courses. In other cases, if a Science Shop is highly reliant on key staff member(s) driving its work, there is a potential risk to the sustainability of the Science Shop if they were to leave.

2.4. Impact assessment

Science Shop projects mostly try to solve a problem or question that is identified by civil society. In this regard, it is crucial to make a systematic impact assessment of the outcomes of research projects to

evaluate their effectiveness in order to provide evidence to founders, sponsors and partners of the benefits of supporting the Science Shop. However, impact assessments are rarely undertaken by Science Shops, even though project evaluations are more common. Moreover, if they are done, they are often not publicly available. This makes it particularly difficult to make broad assessments of the overall impact of Science Shops on society.

Two other factors make it rather difficult to map the overall impact of Science Shops on communities. On the one hand, public awareness of the Science Shop concept remains rather limited. The results of the international stakeholder survey conducted within the SciShops project indicated that awareness of the Science Shop concept varies widely between certain geographical regions and different stakeholders (Bergman, et al., 2018). For example, awareness is higher among researchers than among community organisations and policy makers. Awareness is also higher among respondents from Western Europe compared to Southern, Eastern, and Northern Europe.

The second, and related, factor is ambiguity over the concept of a *Science Shop*. There is no consensus on what a 'true' Science Shop is and what its activities should be. Whereas some argue that a 'true' Science Shop in the strictest sense should by definition implement research projects, others maintain that there are a range of other activities related to research that can also constitute a Science Shop. These activities include stakeholder debates, science cafés, research services/products, and educational activities.

Therefore, the lack of awareness of the Science Shop concept and the lack of consensus on which activities are part of the Science Shop methodology make it difficult to systematically assess their impact on society.

3. Where we want to go: vision and mission statement

As highlighted in previous chapters, there are a number of key challenges facing new or developing Science Shops, which can be ranked differently according to the specific social, economic, political and cultural context of each Science Shop: engaging and involving civil society; finding a sustainable model in terms of funding and staffing; and assessing the impact of CBPR. These are the main issues that have inspired the vision and mission statement of this strategy.

To state the vision in a nutshell: a **Science Shop's vision** is to be recognised as providing transformative CBPR in response to concerns experienced by civil society. This means implementing projects on behalf and with CSOs that inspire and enable changes or result in new perspectives on the issues under investigation.

A Science Shop's mission is:

- to develop, maintain and manage the Science Shop in an adaptable, efficient and sustainable manner;
- to ensure the co-creation, integration and spread of knowledge in civil society;
- to encourage cooperation between private, public, profit and non-profit bodies both to boost societal awareness about a certain topic and to implement evidence-based actions.

4. What should we do? Priorities and strategic objectives

Participatory research in communities aims at bridging the gap between research and society and mediating mutual learning and cooperation processes. Science Shops are designed to provide CBPR, according to the principles of Responsible Research and Innovation (RRI). In line with the vision and mission statements provided in the previous chapter, three priorities (P) can be identified. Each of them can be addressed by pursuing specific strategic objectives (O) designed to address the challenges and threats highlighted in previous chapters (see Table 1).

Table 1 Priorities and strategic objectives for Science Shops development

P1: Communities' engagement
O1 Spread knowledge about Science Shops
O2 Enhance the involvement of CSOs and other stakeholders
O3 Promote partnerships with public institutions and authorities
P2: Networking and twinning among Science Shops
O4 Standardise project datasets for networking
O5 Promote networking and matchmaking at regional, national and international level
O6 Learn from the experience of existing Science Shops (twinning)
P3: Sustainability
O7 Shape your business model
O8 Secure funding
O9 Increase and demonstrate the impact
O10 Increase recognition for CBPR in academia

Each strategic objective is shortly described below, together with corresponding actions and a suggested key performance indicator(s) (KPI) to measure the impact. In some cases, the definition of the strategic objective already entails the underlying actions. In identifying the actions, we were

focusing on the most abstract level, i.e. we were trying to suggest possible broad actions in such a way that one or two actions would be enough to attain the objective.

O1: Spread knowledge about Science Shops

A fundamental step in engaging communities is let them know what a Science Shop is and how they could benefit from involvement. In other words, the first step in fostering communities' engagement is raising awareness of the opportunities that may come from active participation. This can be achieved in different ways using existing tools and documents, for example, through communication activities, utilising a broad range of communication channels and showcasing success stories.

Action	KPI
Promote case studies of successful projects	Number of shown case studies
Promote the work of the Science Shop using a broad range of communication channels	Number of communication activities undertaken

O2: Enhance the involvement of CSOs and other stakeholders

Science shops should improve their work with communities and other stakeholders (groups that are affected by the project or can affect the project or implementation of its results) by involving them in all project activities: from designing a research/project process, co-creating research tools; gathering and analysing data; formulating conclusions and recommendations; to communicating and disseminating research results; and planning actions to exploit results and involve other stakeholders. Stakeholder engagement will result in a better understanding of the issues being addressed by the research; allow the perspectives of the involved stakeholders to be taken into account; improve the quality of research by providing new insights; and subsequently increase the likelihood of research impact.

Action	KPI
Plan and implement co-creation activities	Number of implemented co-creation activities
Involve relevant stakeholders	Number of involved stakeholders

O3: Promote partnerships with public institutions and authorities

Science Shops activities may identify a need for a change in policies and decision-making. The involvement of relevant public institutions and authorities has a potential to increase the impact of aScience Shop project. These interactions are likely to be more productive, beneficial and long lasting when included in the framework of formalised partnerships.

Action	KPI
Develop partnerships	Number of partnerships

O4: Standardise project datasets for networking

The answer to many research questions from CSOs might be found by doing a literature review. In other cases new research might be required. In some other cases though an additional source of already existing answers could come from the work carried out by other Science Shops or CBPR initiatives. If project reports and data collected by Science Shops are organised in a standard (shared) format, then the exchange of information and comparisons will be much easier, especially for Science Shops operating in the same geographic area and/or in the same field of interest. This issue is being addressed by the Inspires project, specifically in its deliverable 2.3 (Gresle, 2018), dealing with the crowdsourcing of a database of relevant Science Shops projects. Making past and present projects publicly available can help achieve visibility as well as provide valuable resources for training purposes.

Action	KPI
Select the database structure	Number of Science Shops using the same format

O5: Promote networking and matchmaking at regional, national and international level

Networking of Science Shops may be carried out at different levels: local (Science Shops themselves can start a network in their area), regional (e.g. the Flemish Network of Science Shops), national or international level (e.g. Living Knowledge). Networking can help to fulfil research requests received by Science Shops, which they do not have the expertise to deal with, as they can be passed onto Science Shops that can handle them. It is worth here to mention though that networking at a wider level than the Science Shop's operation may not be very useful for certain types of research questions such as issues that are locally specific e.g. social/ economic conditions, natural phenomena etc. On the other hand, international networking may provide supporting material for questions that arise from circumstances (environmental issues, health issues…) that have already been investigated in other countries, have already been addressed in updated policies or for which a solution has been proposed on the basis of the socio-economic context.

Action	KPI
Networking	Number of partnering Science Shops/ networks the Science Shops belongs to

O6: Learn from the experience of existing Science Shops (twinning)

Lessons learnt by existing Science Shops are expected to be inspiring and warning at the same time. Through twinning, or other types of mentoring activities, new Science Shops can gain access to invaluable advice and support from establishing Science Shops helping them gain confidence to embrace opportunities and find solutions to problems.

Action	KPI
Participate in twinning activities	Number of consultations or visits

O7: Define your business model

Having a robust business model will contribute to the sustainability of a Science Shop and ensure that all key aspects relating to the establishment and operation of a Science Shop are properly addressed. However, the business model also needs to be flexible to deal with changes e.g. relating to the staffing, funding or other operational aspects that may present challenges to the Science Shop.

Action	KPI
Regularly analyse the performance of the Science Shop	Number of review meetings/assessment reports on the Science Shop's performance

O8: Secure funding

Fundraising is an essential activity for all Science Shops and crucial to their survival. A Science Shop's funding may change during its lifetime and be affected by a number of external socio-economic and political factors. Diversifying a Science Shop's funding sources and ongoing fundraising efforts can help to address these risks. It is also important to keep in mind that it is easier to raise funds when a Science Shop can clearly demonstrates the benefits of its work on communities.

Action	KPI
Fundraising campaigns	Amount of funding collected
Diversification of funding resources	Funding sources secured

O9: Increase and demonstrate impact

Sometimes Science Shops are more focused on conducting CSOs' research requests and do not pay sufficient attention to how the achieved research results will be used to make change in the researched area. However, the concept of impact is one of the key elements of CBPR, and projects should be designed with clear goals in terms of the desired impact. Impact assessment is performed after the implementation of a project and is an essential tool for demonstrating a Science Shop's impact on society. Impact assessments are used to demonstrate accountability, to provide a source of evidence for future project proposals, as well as an argument to support fundraising activities. Being able to demonstrate impact increases the visibility of a Science Shop's activities, strengthening its reputation and, consequently, contributing to its sustainability. Impact assessment should be then planned from the beginning of the Science Shop, assessed periodically and used to improve the initial workplan or strategy.

Action	KPI
Plan and implement a change	Number of achieved changes
Measure the impact of projects by undertaking impact assessments	Number of performed project impact assessments

O10: Increase recognition for CBPR in academia

Participation in Science Shop activities needs to be made attractive to academia in order to motivate and retain both coordination and implementation staff, which often consist of students and researchers even if the Science Shop is not university-based. However, this can be difficult as academic performance is mostly assessed according to the number of publications. Therefore Science Shops should look for ways to promote recognition of community work, for example, by introducing "social credits", including work on Science Shop projects into calculations of lecturers' workloads, and other measures applicable to the context of the particular country, educational system, and institution.

Action	KPI
Seek recognition of CBPR work in academia	Number of performed steps (activities)

5. What support is available? Review of SciShops resources

Strategic objectives are pursued through actions taken by the organisations promoting participatory research or leading the Science Shop. Within the SciShops project, a number of different resources have been developed to support those setting up new Science Shops or running established ones. Some of these resources are sources of information, others serve as blueprints for activities that other Science Shops can undertake on their own.

Some of the most relevant resources have been developed in WP4 of the SciShops project, of which this strategy is a part, and which was concerned with creating guiding documents on establishing and running Science Shops. Other work packages also offer useful results to consider. A number of other external projects or initiatives that provide useful resources for Science Shops are also highlighted. They are all briefly reviewed below.

5.1. Strategy for CBPR and Science Shops' Further Development (WP4)

The creation of a successful, sustainable Science Shop is a huge task. Therefore, the WP4 “GENERATE: Strategy for Community-Based Research and Science Shops' Further Development” was aimed at creating a series of roadmaps and guides to support the work of Science Shops. These resources answer many questions about running Science Shops and CBPR projects, review challenges faced by Science Shops and suggest possible solutions. They can be used by Science Shops (or other organisations engaging in CBPR) at every level of maturity. These reports rest on knowledge about running Science Shops, best practices, and challenges accumulated in previous deliverables of the SciShops project, as well as literature and other sources of information on Science Shops.

5.1.1. Scenarios collection (D4.1)

Deliverable 4.1 “Science Shops Scenarios Collection” provides everyone interested in the Science Shop concept with an understanding of how Science Shops are set up and run. It is based on the key aspects related to the operation of the Science Shop: Organisational model, Funding, Infrastructure, Coordination staff, Implementation staff, Project types, and Thematic scope. For each of these aspects, possible operational options are identified, and the advantages and disadvantages of the identified options are discussed. In addition, several key developments in terms of challenges and opportunities are described for each key aspect, and how they can be handled. The deliverable reflects on how these key aspects play out in different types of Science Shops (university-based, NPO-based, and business-based), and supplements all options and developments with examples from existing Science Shops.

The deliverable would be particularly relevant for strategic objectives O7 (Shape your business model) and O8 (Secure funding).

5.1.2. Practitioner roadmap (D4.2)

Deliverable 4.2 “Practitioner Roadmap and Methodology Toolkits” was created to guide Science Shops in implementing community-based participatory research (CBPR) projects by providing insights, tools and methods, as well as specific Responsible Research Innovation (RRI) tools for effective knowledge exchange in the CBPR process between Science Shops and civil society. Research or other projects run by Science Shops are by definition community-based, but in practice there are varying degrees of community and other stakeholder involvement. This roadmap aims to reveal various ways in which stakeholders can be involved and to help strengthen the participatory dimension of Science Shop projects. It does so by providing a step-by-step approach to the CBPR process, as well as incorporating

approaches from the practice of public engagement (PE) in science, which reveal even more possibilities for stakeholder and citizen involvement.

This deliverable would be particularly relevant for strategic objectives O2 (Enhance involvement of CSOs and other stakeholders), O3 (Promote partnerships with public institutions and authorities), and O9 (Increase and demonstrate the impact).

5.1.3. Training modules (D4.3)

One of the ways to support the creation of new Science Shops is to provide training for the staff of future or newly established Science Shops. The Deliverable 4.3 "Modules for training science shops' staff" aims to assist in this task. The modules present materials and pedagogy on the most essential topics needed to understand how to establish and run a Science Shop: Basics of Science Shops, Operational models, CBPR project management, Stakeholder involvement, Communication and public awareness, Project evaluation and impact assessment. The modules are developed in a flexible manner and can be adapted to the specific needs of users.

The deliverable would be particularly relevant for strategic objectives O1 (Spread knowledge about Science Shops), O2 (Enhance involvement of CSOs and other stakeholders), O3 (Promote partnership with public institutions and authorities), and O9 (Increase and demonstrate the impact).

5.1.4. Establishment guide (D4.4)

The aim of the Deliverable 4.4. "Science Shop establishment guides" is to guide people and organisations establishing a Science Shop through this process by highlighting the main aspects of establishing and running a Science Shop, taking into account different types of organisational models of Science Shops. The guide provides an overview of how to develop your own Science Shop model, the steps that need to be undertaken to establish a Science Shop, and then discusses in detail the various aspects of running a Science Shop, such as staffing, funding, managing projects, etc. It also discusses some of the challenges that can be encountered along the way with suggestions of how to overcome them. Each chapter is divided into concrete questions with the aim of addressing the most important issues that those who are establishing and running a Science Shop might encounter (FAQ).

The deliverable would be particularly relevant for strategic objectives O1 (Spread knowledge about Science Shops), O2 (Enhance involvement of CSOs and other stakeholders), O3 (Promote partnership with public institutions and authorities), O7 (Shape your business model), O8 (Secure funding), O9 (Increase and demonstrate the impact), and O10 (Increase recognition for CBPR in academia).

5.2. Collection of previous knowledge on Science Shops (WP2)

The result of WP2 "EXPLORE: Base Research and European Participatory Community-Based Research Assessment" is a comprehensive overview of the work of Science Shops and CBPR institutions in Europe and beyond, consisting of an analysis of dozens of case studies on institutions performing CBPR from different fields and countries, a collection of RRI tools, a structured taxonomy of the CBPR landscape in Europe and beyond, an assessment of Science Shops' impact on communities, and other results.

The deliverables of WP2 provide a comprehensive overview of work conducted in this field, best practices and networking possibilities. The knowledge accumulated in this work package was used to produce guiding documents in WP4 and can be used as additional resources for all of the strategic objectives. However, they would be particularly relevant for strategic objectives O5 (Promote

networking and matchmaking at national and international level) and O6 (Learn from the experience of existing Science Shops (twinning)).

5.3. Stakeholder engagement and knowledge exchange (WP3)

The result of WP3 "ENGAGE: Stakeholder Analysis, Involvement, Knowledge Exchange Roadmap" is a collection of relevant stakeholders for the Science Shop ecosystem, as well as experts in CBPR (e.g. collection of expert and advisory board for SciShops, collection of stakeholders' insights on CBPR). The work package is concerned with the conceptualisation and organisation of training and knowledge exchange events and results in the development of a "Knowledge Exchange Roadmap" (D3.9) to support knowledge exchange between Science Shops and their communities.

One type of event organised in the framework of WP3 is summer schools. The SciShops project's first summer school was held in July 2018. Summer schools offer an opportunity for anyone interested in CBPR and Science Shops to learn about running Science Shops and CBPR projects, as well as to meet people from other Science Shops. They can be a very relevant tool to support the capacity building of existing Science Shops and embrace networking and twinning opportunities.

The results of WP3 would be particularly relevant for strategic objectives concerning the involvement of stakeholders, as well as objectives related to networking and twinning: O2 (Enhance involvement of CSOs and other stakeholders), O3 (Promote partnership with public institutions and authorities), O5 (Promote networking and matchmaking at national and international level), and O6 (Learn from the experience of existing Science Shops (twinning)).

5.4. Development of the SciShops Web Platform (WP5)

WP5 "EMPOWER: WEB platform with awareness modules, twinning opportunities and knowledge transfer" is concerned with developing of an online platform for Science Shops. This platform (www.scishops.eu) is a crucial contribution to the development of the Science Shop landscape as it will serve as a central online resource of information for Science Shop coordinators and will offer collaboration tools, such as a twinning mechanism.

The results of the work package will be relevant for strategic objectives related to stakeholder engagement, as well as objectives related to networking and twinning: O1 (Spread knowledge about Science Shops), O2 (Enhance involvement of CSOs and other stakeholders), O5 (Promote networking and matchmaking at national and international level), and O6 (Learn from the experience of existing Science Shops (twinning)).

5.5. New Science Shops and twinning (WP6)

WP6 "ESTABLISH: New Science Shops, twinning them with experienced ones for effective knowledge exchange" is concerned with establishing of new Science Shops within the framework of SciShops project, as well as twinning them with experienced Science Shops both from and outside the project. The results of the work package will be particularly relevant for strategic objectives related to networking and twinning: O5 (Promote networking and matchmaking at national and international level), and O6 (Learn from the experience of existing Science Shops (twinning)).

5.6. Dissemination of Science Shop activities and results (WP7)

WP7 "DISSEMINATE: Project communication, publications, networking, and exploitation" is focused on promoting the project research results and findings, and communicating these to specific stakeholder

groups. The results of this work package, particularly the project info website (D7.1) and the collection of factsheets, solution leaflets, newsletters to the general public and stakeholders (D7.2), are relevant to the strategic objective O1 (Spread knowledge about Science Shops).

5.7. Resources from other initiatives

Finally, it is worth pointing out that there are also other numerous written sources on various aspects of running a Science Shop and real-life cases, such as the Living Knowledge toolbox and websites of EU projects such as INSPIRES, PERARES and EnRRICH. Links are listed below:

- Living Knowledge toolbox: https://www.livingknowledge.org/resources/toolbox/
- Living Knowledge library: https://www.livingknowledge.org/resources/library/
- PERARES: https://www.livingknowledge.org/projects/perares/
- INSPIRES: http://inspiresproject.com/
- EnRRICH: https://www.livingknowledge.org/projects/enrrich/

In summary, one can conclude that SciShops and other projects or initiatives provide a comprehensive toolkit to support the establishment and development of Science Shops. Most of the tools are designed to support the organisers of Science Shops in the establishment phase but they can also offer additional information, insights and best practices to inform the work of experienced Science Shops. Although these resources are mainly directed at Science Shop coordinators and staff, they can also be relevant to policy makers, scientists/researchers and the general public participating in CBPR activities.

6. References

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