

Science Education for Action and engagement towards Sustainability (SEAS)

D6.13

Report on preparatory work for the establishment of a SME on Open schooling for science learning

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1. Analyses of the basic conditions for a business plan in the context of SEAS

One of the fundamental basic for the strategy for our development of a business plan was an analysis of the conditions for creating a viable business plan that could create an upscaling of the products (teaching materials, research results, infrastructure, etc.) produced within SEAS as well as creating a sustainability over time.

1. The first condition concerns that research as well as experiences from the implementation of environmental and sustainability education (ESE) worldwide reveals that implementing the topic of sustainability in any traditional subject teaching is difficult, even if it is written into the curriculum. In case of open schooling it is in most cases not part of the curriculum, making it even more demanding to make implementation to be efficient. The reason is that teachers, as any human being, are driven by habits and customs. To change teaching habits takes time and need support and some form of motivation. The conclusion for developing a business plan was that before any individual finding, as a teaching method, or knowledge about students learning in open schooling, could become productified and commercialised there must be an implementation process in place. If such a process is at place than a need amongst teachers might have been created: needs often comes as a result of knowledge and being part of a movement. If a need is established than a motivation is close by. Furthermore, if an implementation process is at place than products and services can be reached out easier. As a consequence we decided that the most fruitful manner of making the outcomes of SEAS attractive for teachers and being an object for up-scaling and commercialisation efforts was probably to connect to the global implementation process of sustainability education. This implementation process is occurring in almost all countries in the world, is supported by national governments and international organisations as UNESCO, UNICEF and EU and has been in place for many years.

2. The second condition concerns the insight that there is a lack of efficient ways of implementation, even when it comes to sustainability education. The main traditional tool for reaching out in implementation process is in-service programs of some sort. Such programs (for example courses, workshops, lectures, etc.) are targeting the capacity development of teachers: that teachers will be more knowledgeable in the content of teaching and/or in the didactics of teaching. This is a crucial up-side of in-service activities. The down-side of in-service programs is that they are often very inefficient regarding the impact relative the cost. It is inefficient because it takes a very long time in order to make every science teacher, in for example Europe, to have gone through a relevant in-service program. Furthermore, there are very few countries that would have the resources – personnel and money – to offer an in-service program for all science teachers. Because of this matter of fact, one of the most interesting niches when developing innovative services and products is to make the implementation process to become more efficient. What these

programs often is lacking is the process of applying the acquired knowledge into practice. The weakness of such a program is well-known: teachers have become more educated but this knowledge is seldom applied in developing new lessons and teaching habits. The reason is that to apply knowledge into a practice is a demanding and also a highly time-consuming task. Thus, here we found an interesting and potential niche for development especially since some of the outcomes in SEAS could be seen as innovative in this context (see below). We also found out through our investigations and consultations (see "D6.8 Report on a database of quality assured teaching resources and lessons") that many implementation agencies were using data bases as a channel for disseminating materials. We also learned that setting up data bases (as was one task within SEAS) is far from enough in itself: the systems need to build in quality assurance processes and quality refinement mechanism that will be used by teachers and others. The third lesson for us was that no other data-base had the ambition to or had succeeded in creating such quality assurance and refinement mechanisms. Here we also did find a potential niche for the business plan.

In the following we describe the methodologies we used in order to create a business plan in the context of SEAS and the results of the methodology in terms of a business plan and other valuable outputs.

2. Methodology

Learning from actors in the edtech industry and innovation financing

During 2021, when things where settling a bit after Corona, we started our journey to explore in depth cultural as well as economic conditions for creating an up-scaling and a duration strategy in Europe. We started the exploration in two countries that seem to differ quite a lot in crucial conditions for the strategies we wanted to create: a possibility to up-scale the findings in SEAS as well as creating economical possibilities for making the work to be successfully continued after the SEAS project has ended. Crucial differences concerned for example existence of databases (in Belgium a state driven data base and in Sweden private ones), economic resources for in-service training amongst teachers (the amount of money devoted to teachers in-service training was quite higher in Sweden), governance of the educational system, digital experiences amongst teachers as well as platforms used (in Sweden Microsoft and Google dominated and in Belgium a national communication platform was totally dominating). One crucial turning point for our exploration occurred when we intensively consulted digital experts and investors working within the edtech business, nationally and internationally. Being member of the Swedish Edtech Industry gave us many opportunities to meet key actors within the edtech industry as well as learning from their analyses of international trends. Here we learned that the edtech industry was attracting many investors and most of the products (on paper, in pipe-line and in the market) was targeting the students.

Furthermore, the main investments and innovation where to be found in USA, and Europe was lacking behind. The trend concerning the focus for the innovations was very much the same as in the high days of educational technology in the end of the sixties and during the seventies, i.e. that the most crucial actor for the success of the learner – the teacher – was bypassed. The whole idea of SEAS goes in the opposite direction: it is only by supporting teachers that we can support students. Thus, the products and services that is developed has to support the teacher and if the products or services would be targeting students it needs to be in the control of the teacher. Our conclusion for the development of the business plan was that here lies our unique selling point (USP) in relation to the edtech industry, which was also confirmed in the consultations.

The niche and USP that we identified, which are in line with the ideas and values in SEAS, was thus:

i. The development of efficient (impact/Euro) implementation tools (described above)

ii. Whatever digital tools developed it must be beneficial for the teachers work, direct or indirect, in order to make the best effect on students' learning.

Another lesson learned when consulting actors within edtech industry was that machine learning and AI was very much focused, although all pointed to the importance to start small, because of its youth, the need of a lot of data as well as the costs and therefore the digital platform developed in SEAS are built for using ML and AI in the future.

To test the benefits of our identified focus (i and ii) for the business plan we discussed with edtech business, investors in edtech as well as with Uppsala university invest. All were positive but found it very difficult to identify the paying custom in relation to potential products and services within SEAS. Since there are many different actors in the implementation process – national and local authorities, NGOs, in-service institutions, companies, schools, teachers, students, etc. – we were advised to think in terms of value production in a multis-actor system instead of in a linear way, for example as creating value only for one type of custom, in this case the teacher. As a consequence one questions came up that needed to be answered:

A. What innovative value do the knowledge, services and products developed in SEAS have for making the implementation process more efficient and for which actors are they valuable?

Methodology: identifying innovative values in the outcomes of SEAS

A theoretical analysis gave us some initial hints regarding the first question mentioned above: What innovative value do the knowledge, services and products developed in SEAS have for making the implementation process more efficient and for whom is it valuable? For example, we identified actors – NGOs, in-service organisations, teacher trainings, authorities, etc. – that already did a lot of in-service trainings and that have capacities, and sometimes also economical resources, to be engaged

in the implementation process. The outcome of the SEAS project, for example knowledge, teaching methods, networks, pilot schools, could be of value for these intermediary organisations and actors.

What was more important in identifying innovative values was the experiences of the work done in the networks and the many seminars, workshops and consultations we have arranged and been part of (see below and "D6.8 Report on a database of quality assured teaching resources and lessons"). Out of these sources of knowledge we identified another type of outcome in the SEAS project that was experiences by teachers and intermediaries as being valuable, namely the form of in-service activities that was developed in SEAS, i.e. transdisciplinary, co-constructive and sometimes also product oriented (creating lesson plans, teaching materials) activities. Except for the values that were expressed by different informants, which we analysed and is presented below, there is another crucial value to be recognised, namely that this specific form has the potential to make implementation process more efficient. What is obvious for anyone that deals with sustainability issues is that they often require interdisciplinary knowledge: knowledge that covers the three dimension of sustainability – the ecological, the economical and the social/cultural – and the connection between them. If you are dealing with sustainability problems and attempts to solve them, it is not enough, as research about sustainability transition research have shown, with only disciplinary knowledge: it often also requires other type of knowledge and skills, as for example deliberative, practical, entrepreneurial insight and skills. It is the same if one wants to develop teaching in open schooling in connection to sustainability problems – one needs many different competences and capacities. In SEAS many of the capacity developing activities was transdisciplinary involving professional knowledge (teachers), didactic competences (researchers, etc.), content expertise (NGOs, researchers, etc.), in-service experts (authorities, etc.). They were also designed for being co-constructive, i.e. designed so that all these competences could become shared in a constructive way. Sometimes these activities also involved the production of lesson plans and teaching materials making the activities to become co-productive. In co-productive activities all participants become both consumers and producers and not, as often is the case: teachers are positioned as consumers of others (researchers, etc.) knowledge and skills. We call this unique form of in-service and capacity development for educational maker-spaces (EMS) or Lesson designed workshops (LDW). Within different forms of EMS, the other outcomes of SEAS – knowledge, teaching methods, services, products, etc. – are used, making them useful for teacher's main task, namely teaching. Why EMS, but also to a degree co-constructive activities, are crucial innovations is that they can solve one of the biggest problems (as mentioned above) in the implementation processes, namely to bridge the time-consuming process from learning to doing (teaching): in ordinary in-service activities the teachers are supposed to do the bridging themselves, when the activities has ended. The consequence is that the bridging is seldom happening. In EMS they are bridged in the same time as capacity development is happening. Furthermore, the bridging is done in a co-productive multi-competence setting, which means that many different competences are in play in the bridging process. This condition is often a guarantee for high quality end-products. Especially EMS but also to some degree co-constructive activities creates unique values (see 1.6 and 1.7) for actors in the implementation process:

Teachers: multi-competence support for developing teaching and learning, appreciation of their professional knowledge, capacity development, high quality teaching and time-saving.

Intermediaries (NGOs, authorities, etc.): multi-competence support for developing and actualisation of in-service activities, appreciation of their competences, capacity development, high quality in-service activities and a higher impact.

Others, for example upcoming projects: a possibility to achieve the above mentioned values in their in-service activities.

In the SEAS project we were also supposed to create a data base, used for disseminating the high-quality outcomes of EMS. EMS is, as any in-service activity, often expensive and in itself they can be questioned in terms of impact/Euro. But if they are combined with a very efficient dissemination tool, making the outcomes accessible for all teachers, it becomes very interesting since taken together many unique values for many actors in the implementation process can be created. As was described in "D6.8 Report on a database of quality assured teaching resources and lessons", we made several investigations in order to come up with a decision how the SEAS data base would be designed in order to become a unique tool in implementation- and up-scaling processes. As we learned about the importance of taken the perspective of the need of the teacher as our driving force when developing digital tools (see 1.3. above) we took part in an investigation of teacher's need and experiences in Belgium (see below and "D6.8 Report on a database of quality assured teaching resources and lessons"). What we learned from that investigation was that many teachers experienced it to be difficult and time-consuming to find relevant and trustworthy materials on existing data base. Thus, to make sure that the materials shared on SEAS database had to be of high quality become crucial because it also made teachers to earn time, not only quality. Time-saving and quality are two values that for teachers did go hand in hand. The consequence for the development was that the EMS and the data base needed to become a functional system: through different forms of EMS it is possible to feed the data bases with products of high quality and through the data base the products could be reached by any teacher.

Another important consequence of our investigations was the decision to develop a digital platform where one of the functions was a data base. The other functions developed was done with the purpose to add unique values to the values of EMS. One of the functions – referencing index – that was developed created a better tool to measure impact than only downloads, which is the measure that many uses. The referencing index was created in order to visualise the process of quality accumulation and refinement. In science researchers refer to earlier research that they build upon, thereby showing the accumulation and refinement process that is involved in the production of new knowledge and products. We introduced a referencing system in the data base making It possible to visualise the same process in the production of lesson plans and teaching materials. In our knowledge, this is a unique function for SEAS data base. This function also makes it possible to create a reference index for lesson plans and teaching materials, showing how many times the product has been used (and referred to) when others have created new lesson plans and teaching materials. This is also a unique function, as far as we know, and add an informative-value for teachers who are

looking for materials and lesson plans. But it also offers values for others actors in the implementation process as well as for the authors. Below we describe the values we have identified in relation to the SEAS digital platform. These values have been identified through analyses and consultations (see 1.6 and 1.7):

Teachers: as author - visibility of their work; appreciations of their work visible through downloads and references; feed-back for teachers, researchers, etc.; identifications of potential partners (those who reference them). As down-loader: High quality materials; visibility of quality and refinement (downloads, references and reference index) and potential partners.

NGOs: Efficient dissemination; through the reference system an index they can get relevant data on impact, getting a "map" of teachers using their material and thereby potential collaborators; a possibility to identify new versions of their materials, and/or new contextualisations of their materials, and quality refinement; getting new relevant materials for their in-service activities.

Authorities: Same values as for NGOs, but also that their different in-service programs will not be just once-upon-time: it will have a continued life through the materials created disseminated though the library; the impact on each in-service programs program will be upscaled.

Teacher education and student teachers: as teacher educators – accessible and searchable tool for getting unique material for their teaching; students can become part of the development of the profession by making them analysing and sharing the results to authors, to develop and publish new lesson plans, etc. and to get in contact with authors for discussions. Student teachers – more useful and relevant preparation for their work as teachers; higher motivation to already be part of the development of the profession.

Although we did identify many important values for key actors in the implementation process, we still had to find out how these values could be set to work in a way that would make the system of EMS and the digital platform economical viable and sustainable. We therefore decided to learn more from others that have tried to make production of values in multistakeholder system functioning in a way that also make some form of commercialisation and/or economic viability and sustainability possible. We decided to focus on innovation projects/organisations/companies that was focusing on sustainable transitions since such projects, etc. often work in complex systems inhabiting different types of stakeholders.

Methodology: learning from common oriented Peer-to-Peer organisations

In order to learn about commoning and Peer-to-Peer (P2P) we contacted a nestor in this area, Michel Bauwens. He is the founder of the "The P2P Foundation", which is an international organization focused on studying, researching, documenting and promoting peer to peer practices.

We had many meetings, and together we also launched a series of seminar as well as a series of workshops (see below).

In 1.8 we present a general business plan since it is not possible to go into details taking into account all different contexts and circumstances that exists in all countries and amongst partners in different countries that take part in SEAS. As a complementary to that plan we have below listed sources (coming from the wiki of P2P foundation: https://wiki.p2pfoundation.net/Main_Page) that deals with crucial aspects that need to be decided on when making a business plan that fits the context of the country as well as specific circumstances, as for example the specific product, the members, the vision regarding profit. These sources can be helpful when designing a country-specific business plan taking departure in our designed business plan. Before listing them just a short intro.

The concept of P2P originated in technological communities and is connected to the innovation to let computers, their informational modules and the humans producing and using them to directly communicate with each other. This innovation has made it possible to scale up self-organization of non-territorial cooperation beyond the limits of market and state institutions.

The concept of commons is mostly referring to shared resources, which are maintained, produced or protected by communities or groups of cooperating stakeholders, and governed according to their own rules. Historically, commons were institutions governing physical resources, such as river basins and forests. During the last two decades one can detect an increasing interest in P2P creating commons. For example since 2008, there has been an important growth (tenfold in a decade) of the number of urban commons in cities.

There are some different common-based business models. Below we have listed some sources that discuss these:

Business Models for the Commons: Panel at the Wizard of OS 2006 conference:

SXSW Talk on Commons-Based Business Models:

- Business Models for DIY Craft
- Business Models for Fab Labs
- Business Models for Influence and Reputation
- Business Models for Open Access E-Books
- Business Models for Open Hardware
- Business Models for the Commons
- Business Models of European Service Platforms
- Business Models of Fab Labs

- Business Models to Support Content Commons
- Businesses for the Commons Projec

There have been some case studies of different business models that also gives interesting information:

- Arduino - Business Model / Arduino's Open Source Hardware Business Model
- Coursera - Business Model
- Coworking - Business Models
- Etsy - Business Model
- Flickr - Business Model
- Fora do Eixo - Business Model
- Hacker Spaces - Business Models
- Maker Business Models
- My Arms Wide Open Community Business Model
- Threadless - Business Model

There are different ways of govern in a common-oriented organisation. Below we have listed studies focusing on the **governance** of projects:

- Burning Man - Governance
- Creative Commons - Governance
- ThinkCycle - Governance
- Wikipedia - Governance
- Apache - Governance
- Debian - Governance ; Study on Debian Governance and Social Organization
- GNU Compiler Collection - Governance
- Linux - Governance
- Fetchmail - Governance

The power balance in multistakeholder cooperation: One of the issues with potentially large ecosystems of cooperation is to align the major stakeholders and potential large contributors. Here a multi-stakeholder format can become useful since it focuses on creating a priori agreements between the stakeholders in order to avoid the domination by one or a few key players.

For further information regarding the concept of stakeholder in business see http://en.wikipedia.org/wiki/Stakeholder_view). Regarding the concept of stakeholder in coops see http://buildingmanew.brakethecycle.org.uk/wp-content/uploads/2013/02/Somerset-Rules-2012.pdf)

Some examples of practices and tools are found below:

The "multistakeholder Fifth Season Cooperative (http://community-wealth.org/content/fifth-season-cooperative-building-community-wealth-and-regional-food-system);http://community-wealth.org/sites/clone.community-wealth.org/files/styles/adaptive/public/FifthSeasonFinal-01_0.png?itok=hAKBu9ET

"Riversimple": 40 Fires Foundation.

A Multistakeholder Voting for Companies: http://graham-boyd.biz/blog/multistakeholder-voting/

There are different **funding models** that can be used in the context of SEAS business model. Below we have a list of different forms of funding models to take inspiration from:

- OER Contributor-Pay Based Funding Model
- OER Conversion-Based Funding Model
- OER Donations-Based Funding Model
- OER Endowment-Based Funding Model
- OER Funding Models Based on Partnerships and Exchanges
- OER Governmental-Support Based Funding Model
- OER Institutional-Support Based Funding Model
- OER Membership-Based Funding Model
- OER Sponsorship-Based Funding Model
- OER Institutional-Support Based Funding Model
- OER Governmental-Support Based Funding Model
- OER Funding Models Based on Partnerships and Exchanges

3. Learning from teachers

Exploratory in-depth interviews with seven teacher (trainer)s and a survey for teachers (n=79) (Van Vooren 2021) complemented by an analysis of field notes and transcripts of meetings in the Belgian SEAS network and interviews with the actors involved in it, resulted in the identification of some key elements of the needs and habits of teachers:

- A majority of teachers are interested to have access to inspiring lesson plans and teaching materials: 43 out of 79 survey respondents indicate that they want to inspire and be inspired.
- Many teachers find it difficult to find materials of high quality: 42,7% of the respondents is not finding reliable sources while preparing their lessons; 52% indicate that making choices between all available materials while preparing their lessons is difficult.
- Text books are the main source of inspiration for creating lesson plans: 84,6% of the respondents uses an existing textbook as a basis for their lesson plans; nobody uses 100% prefab materials.
- Teachers' are already sharing lesson plans and teaching materials: 92,3% of the survey respondents already share lesson plans and teaching materials (95,8% of them in their own school, 27,8% on public platforms).
- The reason for not sharing materials are they are afraid that their work is not good enough or to get criticism: *'I think my work is not good enough"; 'I'm afraid that I'm not respecting the copy rights; 'I'm afraid for the criticism.'*
- Some teachers are involved in sharing materials in order to save time: 26 out of 79 respondents indicate that they share materials to save time; 16 out of 79 respondents indicate that they share materials for efficacy reasons (win-win situation, not reinventing the wheel).
- Teachers seem to be willing to share materials as part of wanting collaborations: 40 out of 79 respondents indicate that they feel enthusiastic to share materials when they are helping others with it Teachers' willingness to give each other feedback is driven by the desire to help each other, to collaborate and to get feedback in return.
- Some teachers want to be compensated and/or acknowledged when sharing: 30 out of 79 respondents indicate that they want acknowledgement for their self-created materials; 4 respondents mention that they would like a system for copyrights.
- There are more teachers that download than upload: 65,4% of the respondents are using KlasCement, of which 46,2% mainly to download, 3,8% mainly to upload, 15,4% both as a downloader and uploader.

As a summary one can conclude that the habits and needs of the teachers are in line with the idea of creating a data base with built in quality assurance and quality refinement. They express a desire to get inspired by materials but also an experience of having difficulties to find material of high

quality. Furthermore, there seem to be a willingness to share materials and give feed backs especially in relation to the willingness to collaborate and to help each other.

4. Learning together

We – Östman from Eduquality, Van Poeck from Ghent University and Michel Bauwens – organised 4 seminars (with invited speakers) in order to upscale and sustain the impact of SEAS open schooling networks. This allowed us also to get an understanding of the legal (licenses, copyrights, etc.), economical and organisational (different kind of organisation with different forms of governance, etc.) aspects of building multistakeholder commons through P2P. The invited speakers where

- Daniel Christian Wahl provides a synthetic overview of the evolution of sustainability approaches towards the Regeneration paradigm: Beyond Sustainability Towards Regeneration.
- Terry Irwin, an expert in transition design, reviews the state of sustainability design approaches and will suggest possible responses of educational institutions.
- Andrew Simms of the STEPS Centre has focused on the need for speeded up transition dynamics, i.e. the concept and practice of 'Rapid Transition, as time is a huge factor in human adaptation.
- Rob Shorter (https://doughnuteconomics.org/members/4) from Doughnut Economics Action Lab (DEAL) presents the work in the DEAL.
- Pascal Desfarges of the Retiss agency has been working to make Makerspaces a central feature for regional sustainable development, collaborating with governmental institutions in France. Makerspaces are 'third places' that combine physical community with technical engagement in ways that transcend the old boundaries between making and conceiving.
- Zachary Stein has studied the linkage between education and technology in the context of societies in transition and planetary crises. In his book, *Education in a Time Between Worlds*, Dr. Stein represents the vanguard of the ecologically aware educational experts.

It became clear that some of the participants, especially in Sweden, Belgium and Norway wanted to push the process a bit further, going beyond listening and discussing: they wanted to try it out for real. It became decided that we will start up a pilot case in Sweden and Belgium, realizing that the pilots might not be finished up before the SEAS project ended, but also anticipating that the piloting would generate a lot of knowledge and insight that would be uniquely valuable. We organised 4 action-workshops in Spring 2022 where people who was interested in being part of the piloting participated. Even here NGOs and authorities as well as researchers from different teacher education institutions were represented. They engaged with the following questions to define their Commons:

What exactly is it that we want to co-produce?; Commitment: What do we burn for and want to realise?; Contributions: What can we do/offer to make it happen?; Conditions: What is needed to make that possible?; and Consensus: What do we agree upon for building a partnership? (see Padlet used during the workshop). Furthermore, they mapped potential activities to develop in order to fulfil several functions (see Padlet). These workshops will continue in autumn of 2022.

In the piloting process we also staged meetings (see below) with key stakeholders within the educational system in Belgium and Sweden and internationally (Unesco, Unicef) with specific actors working with sustainability transitions through P2P and towards commoning as well as Tech Transfer at Ghent university and Uppsala university investment

The action workshops together with analyses of documents, field notes, interviews (partly also from Van Vooren 2021), and transcripts of meetings in the Belgian SEAS-network gave us the following information and knowledge about what they appreciated:

- The availability of strong, useful, diverse, and complementary expertise was experienced as a strength:
  - Researchers (Uppsala, Stockholm, Örebro, Malmö and Gothenburg university in Sweden; Gent University, Brussels University, Hasselt University, HOWEST university college in Belgium) with pedagogical/didactic expertise (incl. in sustainability education and open schooling) and experience in crossing boundaries between theory and practice (e.g. action research through co-creation in pilot studies).
  - Partners with useful content expertise: NGOs (WWF Sweden, The Swedish Society for Nature Conservation**,** DJAPO, Siemens Foundation, Éducation21, Prinsparets Stiftelse, etc.), authorities **(**MOS Ecoschool coaches, "The Global school" at the Swedish Council for Higher Education, Flemish government's Department of Environment, the Province of Limburg, etc.), etc.
  - Partners with decades of experience in coaching schools on sustainability education: for example MOS Ecoschool coaches, environmental education staff of Provinciaal Natuurcentrum Limburg, "The Global school" at the Swedish Council for Higher Education.
  - Teachers and principals with proven practical experience.
  - EduQuality AB, with experience in developing tools and processes for the co-creation, sharing, and quality refinement of lesson plans and teaching materials.

- The possibility to, through the SEAS library, share lesson plans and teaching materials as a potential vehicle for quality assurance and for avoiding to re-invent the wheel over and over again and, thus, to save time.

- The experience of and tools to conduct product oriented educational workshops (for example LORET) where didactic researchers, content experts, teachers, and partners collaborate to co-create lessons and teaching materials as a driver for quality assurance and refinement, for

'feeding' the library with useful and high-quality materials, and for the development of a collegial community that can empower and inspire teachers.

- Concrete methods and tools for quality refinement system as for example referencing system for tracing how users build on and adjust each other's work (e.g. to contextualise it to diverse settings, to update it), protocols for reviews by teachers, protocols for reviews by researchers.

5. Business plan

The focus of the business plan become, as a result of our investigations, consultations, etc., to build multistakeholder organisation, that can have different forms regarding who can become owners, members, etc. The main ethos of the organisation is to make implementation process more efficient, including a real support of teachers. The external functions of the organisation are the following:

1. The organisation is offering a data base for making commons accessible nationwide without any costs for the users.
2. The organisation is offering possibility for the intermediary members (authorities, NGOs, etc) to offer lesson plans and teaching materials for free to teacher and others.
3. Anyone can, for free, upload materials on the platform, but it will only be public after some form of quality care has been executed by the members or proven otherwise (see 4).
4. The members, through the organisation, offer for free specific designed activities (for example feedback workshops) for quality care and refinement under the condition that the products (lesson plans, etc.) can be shared for free in the data base.
5. The members, through the organisation, offers for free (sometimes together with other actors not part of the organisation), specifically designed activities (analog and/or digital) for co-production (for example Lesson design workshops) under the condition that the products (lesson plans, etc.) can be shared for free in the data base.
6. The organisation offers unique mechanisms in the data base (referencing system and index) for visualising quality care and refinement of the common.
7. The organisation offers possibilities to use material for research if the authors agree, if the research is fed back for free to authors and if the result is fed back in a form that researchers and authors agrees upon.

These external functions, and the innovative tools connected to them, creates a societal value of making the implementation more efficient with the consequences of savings of money and other resources as well getting a higher quality in the outcome of the implementation: teaching and learning. For the teacher the values are: free support, saving time, higher quality of his/her teaching, network and visibility/acknowledgement. These values taken together would ideally make the

business plan to be financed and put into practice immediately. But probably there needs to be extra values added that motivates the intermediaries to make it to become realized. These extra values were presented in 1.4. In the same section (1.4) the unique values for the teachers were presented. Altogether we have identified crucial and strong values, and some also uniquely innovative values, for all central actors involved in implementations process if one combine EMS and co-operative forms of in-service activities with SEAS digital platform.

The economic resources necessary are supposed to be generated by the members who are doing in-service activities and who already gets the funding through the state, donors, etc. The extra costs for being part of the organisations – licenses for the digital platform (including the data base) and the running of the platform – are small in relation to the extra values the organisation is generating (see above) to each member, especially if enough actors (around 10) are part of the organisation. It is difficult to exactly calculate the cost for each partner in such organisation since some functions (for example the editor of the platform) could be included in some partners ordinary task and it is also dependent on the ambition level of the communication function. A rough calculation would be a cost between 4000-10000 Euro per partners if they would be 10 in the organisation.

There are also the possibilities for generating economical resources in the organisation. Here comes some examples:

- Since the implementation processes becomes more efficient there are possibilities that authorities, external donors, etc. are willing to finance parts of the costs or members activites (see further 1.5)
- The common resources could be used by a member or an external actor in a commercial activity (for example a school pays for Lesson design workshops not possible to offer in other ways), but only if there exist a reciprocality (regulated juridically), for example that a specific % of the earning goes to the consortium and/or authors (teachers for example) and that the material produced is uploaded to the platform (see further 1.5).

The challenges that we identified during our piloting are the following:

- Silos-mentality (that one habitually stick to the "guild" that one is part of).
- Competition mentality (for example that NGOs often compete for the same resources).
- Finding appropriate organisational form and way of governance that suits all actors.
- Time-consuming to arrange meetings that can overcome the above mentioned hindrances
- Lack of inspiring examples to learn from within the educational sector.

We have not payed attention to many specific teaching methods, materials, didactic knowledge, etc. that has been produced within SEAS that could have the potentiality for productification and commercialisation. Since these outcomes are of different character it would require separate analyses as well as separate business plans to fit the character of the outcome. This has not been

possible within the amount of time available in the project. On the other hand, if the designed business plan would be realized than the door has been opened for reaching out to actors in the implementation process with many of the outcomes of SEAS, and some of them would probably also be possible to commercialise in such a context.

Outcomes

The work done has resulted in a general business plan built on different complementary analyses, investigations, consultations, seminars, workshops, and not least crucial: a piloting in Sweden and Belgium. We have complemented the business plan with a list of resources that can be used when contextualising the general business plan in relation to the specificity of the country/region and the specific circumstances at hand. We have also created a network of people that are interested in developing commons in education connected to sustainability issues, including open schooling in science subject. Through the connection (created through the seminars) to ongoing common oriented P2P projects there is possibilities to get concrete inspiration with detailed juridical, organisational, economic and technical issues turning up when creating similar organisations within the educational sector. The piloting in Belgium and Sweden has started and a big enough group of different stakeholders in each country is being formed and it is not unrealistic that these pilots will be up and running beginning of 2023. We are continuing the piloting process in autumn with seminars and action workshops, together with Van Poeck at Ghent university and Bauwens) and we are happy to share results in the coming year.



SEAS

Science Education for Action and engagement towards Sustainability

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