OPEN DISCOVERY SPACE

The Open Discovery Space Methodology for introducing innovation in schools

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1. Introduction - What is Open Discovery Space?

The Open Discovery Space (ODS) project http://portal.opendiscoveryspace.eu/ is a key initiative for introducing innovation in schools. The project addresses the challenge of modernizing school education by engaging teachers, students, parents and policymakers in a first of its kind effort to create a pan- European eLearning environment that promotes more flexible and creative ways of learning by improving the way educational content is produced, accessed and used. ODS is co-funded by the European Commission in the framework of the Policy Support Programme (PSP) and addresses the key objectives of the "Digital Agenda For Europe– Action 68".

ODS cultivates sharing and collaboration, making the teacher the core node of a creative community. It thus creates a multi-lingual, community-oriented social platform that encourages teachers, students and parents to discover, discuss, share, shape and acquire a rich array of teaching, learning and research materials. The project uses a bottom-up, collaborative method to drive the uptake of digital learning resources and inspire teachers to develop and use innovative, ICT-enabled teaching practices. The ODS community has exceeded its goal to engage 2000 Primary and Secondary European schools and is now actively engaging more than 2400 schools, while the final target is to reach 7000 teachers and more than 100000 students.

The ODS platform also hosts digital Training Academies for teachers and parents that offer a rich variety of resources in various formats (videos, moocs, google hangouts) on topics such as digital competences, e-safety, educational design, collaboration between schools and parents etc.
The platform also provides teachers with educational design authoring tools that enable them to create, store and share their own lesson plans and educational scenarios. All these tools are available through a digital community that each school can set up on the platform, easily and free of charge. This community– based structure of the ODS platform has led to a series of innovative school activities that were designed by the teachers themselves and have been shared with peers from all over Europe.

2. The Open Discovery Space Innovation model

Open Discovery Space has designed and is currently in the process of testing a model for school innovation that evolves in 3 phases, i.e. *Stimulation*, *Incubation*, *Acceleratio*,n and 5 key-features. The model is presented in Figure 1 and is analysed below.

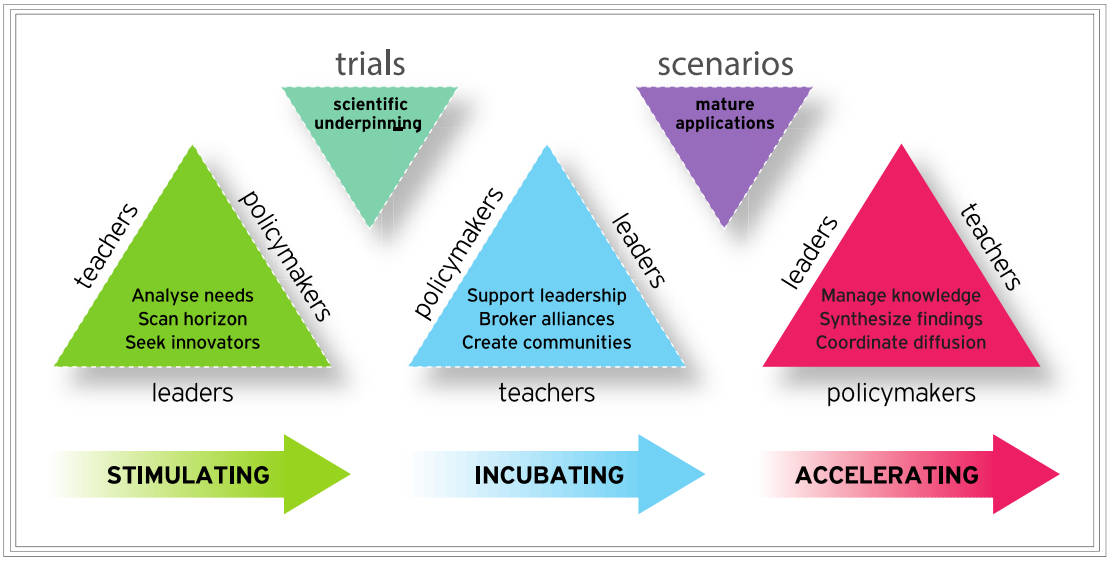

Figure 1: The Open Discovery Space Innovation Model

1) Stimulation

The Stimulation phase includes the analysis of a schools' needs and the development of a school action plan. Each school is provided with a set of tools that are intended to support these two tasks:

- An e-maturity self- assessment survey for the school, that measures the degree to which the ICT and open learning resources (OER) are used in the school, the culture of the school towards ICT and OER, and whether there is a common vision about the development of the school in terms of innovation and technology.

- A self-assessment tool for the teachers' individual competences in terms of ICT literacy. The tool has been developed based on the UNESCO ICT Competency Framework for Teachers (2011). Heads of schools are invited to complete first their own competence profile and then encourage the rest of their schools' teaching staff to follow. This self- assessment process is clearly not of a competitive nature, rather a means for the needs analysis of the school.

- The self- assessment at organizational and individual level is followed by the development of a complete action plan, which describes the vision and development goals of the school and the activities that the school will undertake to accomplish them. It also addresses the aspect of collaboration and opening up of the school to networking and collaboration with other stakeholders and parents at national and European level, and encourages the staff to think about how to deal with any obstacles to innovation.

2) Incubation

After the phase of stimulating the teaching-learning process, and the different trials to explore Resource Based Learning (RBL), teachers need time to re-visit their own perspectives and experiment in their own classrooms: Incubation is that phase. RBL is a powerful and versatile pedagogical approach that needs time to be successfully applied in classrooms.

The process of incubation is based on providing support, designing targeted interventions and implementing innovative practices in order to establish in schools a culture that is open to change and spread a common vision for learning and growing. During this pilot phase new teaching and learning practices are tested and open educational resources (OER) are key. So is the interaction among the teachers through an environment such as the ODS platform, and the development of thriving digital communities. Emphasis is also given on teacher training and professional development by national and international initiatives and pilot actions, such as the ODS Summer and Winter schools, conferences and regional workshops.

As far as the digital communities are concerned, a main task for the heads of schools is to identify ideas, practices and members of staff who can function as agents of change and innovation. A digital community should be responding to the school's actual needs, taking at the same time in account the requirements (and possible limitations) of the curricula. They should bd also characterized by trust, empathy and acknowledgement of the school's profile and the teachers' competences, strengths and weaknesses. As Wideman (2010) articulates, these are the basic conditions that support teachers in their transition from "Basic users" to "Advanced and Technology Enhanced Activities Designers".

3) Acceleration

During the acceleration phase an educational change is intended to extend to a large scale intervention. This phase aims at spreading innovation. In a centralized educational system, this stands to be achieved through a governmental educational reform. In the decentralized systems, the district superintendents and school principals are likely to play significant roles. Throughout this phase, attention is given to:

- exploiting knowledge management techniques (sharing what is known within ODS partners and participants);
- synthesizing evaluation and research (to inform efforts);
- accelerating diffusion with national agencies (to reach increased numbers of users on the ground).

There are two kinds of processes in this phase: dissemination and diffusion. School principals and headmasters play a crucial role in both of them (both directly and indirectly). **Dissemination** is a one-way process, where information is offered or broadcast. In ODS information is shared, e.g. through presentations, workshops, webinars, training academies, meetings, websites or other media. Complementary to this, **diffusion** is the process through which interventions are pulled into practice from within. For example, practitioners exchange information, arrange demonstrations, or coach each other. Diffusion is not necessarily an absolute criterion for measuring the success of an intervention, but its presence is an important indicator. It is a "spread within" which can be seen, for example, when reforms or norms of social interaction become embedded in school policies and routines, or when teachers draw on those ideas and apply them in other aspects of their practice, which were not explicitly addressed by the intervention.

Diffusion tends to be less common than dissemination. Here again, the role of school leaders is important in creating a positive atmosphere, exchange opportunities and openness among the staff that will gradually lead to the diffusion of an innovative practice.

Dissemination
One-way process, where information is offered or broadcast. In ODS, information is shared, e.g. through presentations, workshops, webinars, training academies, meetings, websites or other media.

Diffusion
Process through which interventions are pulled into practice from within. For example, practitioners exchange information, arrange demonstrations, or coach each other.

3. Supporting the role of change agent teachers

Asking teachers to adopt advanced ICT methods in their everyday teaching practice constitutes a major attitudinal and behavioural change and at the same time a significant development opportunity for them. The task at hand is to manage this change in a uniform way, allowing teachers to realize the potential of the opportunities offered, take ownership of their contribution and maximize the output of both the implementation process and of their own professional development.

In order to ensure long-standing commitment to the vision and the objectives of ODS, as well as to coordinate the work done in the pilot schools, the ODS approach includes the 'appointment' of a member of staff acting as change agent. The role and profile of this person is identified as a pioneering teacher, or member of school management, who is already evidently engaged in innovative practices and leads the team of the participating teachers from each school. The mission of the change agent is: a) to take initiative in order to implement innovative practices that aim to have long-term effect on the development of the school as a whole, b) to develop a strategy for involving and disseminating the results of innovative practices to the whole school community, c) to identify the sources and symptoms of resistance to change and to develop a strategy for dealing with it, d) to provide feedback on the organisational changes that take place during and after the engagement of the school in ODS. The member of staff who holds this role is also facilitating the promotion of five key prerequisites for accelerating and establishing change, proposed by Lawson and Price [6]: a) Establishing a purpose to believe in, b) Enabling reinforcement, c) Overcoming barriers, d) Developing the skills required for change, e) Developing consistent role models.

In practice, although the processes for being appointed the role of change agent are contextually variable, in all cases undertaking this mission is clearly voluntary, despite the increased responsibilities of this person. In order to inspire, motivate and encourage the change agents, a series of dedicated workshops are also organised in all of the 22 European countries that currently participate in the implementation. The objectives of these workshops are to identify the obstacles to change and different types of resistance to change that the change agent teachers

may be facing, as well as to support them in designing strategies for dealing with them. The overall approach also includes the setting up of a network of change agent teachers that reflect on the progress of their interventions and support each other in follow-up face-to-face workshops or online, through a dedicated change agent online community on the ODS portal, which currently numbers 77 members and gives access to change management resources and social networking facilities. Further motivation strategies for change agents are used at national level e.g. by providing opportunities for free participation in training events, Summer or Winter schools. These training events serve to equip the teachers with the skills needed to respond to technology-related changes, as well as to connect with teachers across schools, within and across national boundaries, which is also further facilitated by the social networking tools of the ODS portal.

4. Scenarios in action

Scenarios in action are the catalysts for the transition from the Incubation to the Acceleration phase. Scenarios are propelled by the change-agent teachers and supported by external agents (e.g. national coordinators). Both the people and the innovation itself influence the ways in which scenarios unfold. In his classic work on diffusion Rogers (2003) identified characteristics of innovations that determine their uptake and use. These characteristics are woven throughout an example of a change-agent scenario:

- *Relative advantage*: What's the added value?
- *Compatibility*: Will this change require other changes?
- *Complexity*: How detailed is the change?

- *Trialability*: Can I experiment with it before committing?
- *Observability*: Can I see it in action?

The scenarios exemplify, in scalable ways, how the intended outcomes can be achieved. Key elements for the scenarios are the contexts, the resources, the tools, the scaffolds, the impact on school innovation and the lessons learned.

Example change agent scenario (A)

Mr. Alexandros Kofteros from Cyprus, teacher in a disadvantaged school, managed to attract five other teachers from the same school to the ODS organisation and implementation process during scenarios in action. The participant teachers put a lot of hard work, while exemplifying many evidences of engagement and commitment. Finally, they decided to present their work to the national contest for the best ICT-infused scenario, organised by the Pedagogical Institute of Cyprus.

During this process, the presentation skills of the participant teachers were greatly enhanced. The result was that two out of the five scenarios, presented by the participant teachers from the school of Mr. Kofteros, were rewarded in the final contest with prizes for innovation (Creating a model of Chirokitia Neolithic settlement using a 3D printer) and good practice (Learning about myself and others).

The hidden curriculum behind this scenario in action is related to how a disadvantaged school can become a school innovation center. Also, it exemplifies the importance of triggering the intrinsic motivation of the participant teachers in tandem with the courage and determination of the change-agent teacher. Another lesson learnt is related to the crucial role of the change agent teachers, provided that they have realised their roles, as well as, to how satisfying are reward systems and recognition for the hard working teachers (observability).

The change agent teacher of the disadvantaged school often quotes John Woods by saying: “The player who makes the team great is more valuable than a great player. Losing yourself in the group, for the good of the group, that’s teamwork!”

Another enabler is the close relationship of the learning topics with topics of the curriculum: the participant teachers were challenged to use resources and tools in order to serve their learning goals, while gaining important ICT and presentation skills throughout this process (trialability). Taking into account their relationship with RBL and school innovation, scenarios in action might best be described using the structure of Hill & Hannafin (2001).

Creating a model of Chirokitia Neolithic settlement using a 3D printer

Context: Based on an initiative to develop 3D printing, schools formed collaborations and worked in developing original content. Eventually, 3D models of the ancient Chirokitia settlement were created. Students from four different grades (aged 9-12 years) and educators that teach three

different knowledge domains (history, technology and maths) participated. Participants engaged in a cross-disciplinary project with various forms of learning and multiple sources of information.

Resources: 3D printing is an innovative teaching and learning practice. The ODS 3D printing @ Schools Community focuses on discussing and organising 3D printing actions, in order to address learning and teaching needs with powerful digital and physical representations while reusing existing infrastructure in a dynamic pedagogical context. Aim of this community is to raise teachers awareness on 3D printing, organise training events on design, use and deployment of design software and 3D printing infrastructures in schools and elsewhere, initiate cross discipline, augmented reality driven, projects between schools and other institutions using, mainly, 3D design and printing activities (relative advantage).

Tools: mobile devices, an easy-to-use 3D CAD tool for modelling 3D designs, history educational software and 3D printer.

Scaffolds: Students were supported by their educators (through dialogue and especially designed worksheets). The teachers were supported by the change-agent teacher (reduced complexity) and also they helped each other (reduced complexity, observability), since the project was a cross-disciplinary one.

Process description: an educational visit to the settlement in the context of the history course where data about the settlement were gathered (mobile learning, evidence-based learning); creation of a digital replication of the monument by modelling a 3D representation through a cross-disciplinary approach that combined mathematics (volume and area of 3D shapes, ratio and analogies) and technology education (3D modelling and 3D printing).

Impact: Regarding to school innovation, this scenario embraces project-based learning and mobile learning in conjunction with evidence-based learning (students are learning outdoors using mobile devices to collect evidences) while bridging informal with formal learning. Also, it embraces all kinds of collaboration (teacher-teacher, student-student and student-teacher). Finally, it has provided insights to the participant teachers about the affordances of mobile learning (Relative advantage). By the end of the project the participants had a holistic idea about life in the ancient Chirokitia Neolithic settlement.

Lessons learnt: RBL as a means of providing a) a protective environment to enable the collaboration and the exchange of knowledge between colleagues and b) an intriguing learning environment with lots of cognitive and social stimuli to enable peer learning between students. Also, unintended learning on behalf of the participant teachers in their effort to design an ICT-infused learning “ecosystem” that would best serve the learning goals and the students’ needs.

Links:

- http://portal.opendiscoveryspace.eu/blog/alexandroskofteros/20130603-433
- http://portal.opendiscoveryspace.eu/community/3d-printing-schools-community-270
- https://tinkercad.com/

Example change agent scenario (B): Love of reading- Learning about myself and others

Context: A common project between 4 schools (1 in Cyprus and 3 in Greece) based on the book “Lit Book of the Great Psychological Opposites” (Oscar Brenifier). Schools came together through their participation in the ODS project. Even though material was developed (and shared) by the

participating teachers, additional digital resources were used, saving time and effort for all involved in the project (relative advantage).

Resources: The idea was to change the attitudes of the students towards reading books - instill to them the love of reading- while they learn about themselves and others. Towards this end, a social constructivist approach was followed and an online community of interest was created (compatibility). The book "Lit Book of the Great Psychological Opposites" was used as the basis for the creation of the digital resources, the forum was used to enable asynchronous communication, the web conferencing system and the chat were used for synchronous sessions, a digital glossary was shared among participants, online quizzes were generated for assessment purposes and, finally, a range of open-ended activities were created to serve the learning goals.

Tools: the open-source web conferencing system "Big Blue Button" , a customised version of the "Moodle" open source Learning Management System,) other elearning services, like linoit, a free sticky and canvas service, and a projector.

Scaffolds: "Bookie", a pedagogical agent, integrated in the moodle e-course, designed by the participant teachers; its aim was to help students (conceptual and procedural scaffolds) while they were coping with the respective learning tasks and to foster self-regulating learning. Also, teachers literally undertook the role of the avatar "Bookie" occasionally and facilitated the synchronous discussions in the chat. As already mentioned, the change agent teacher provided continuous support to the participant teachers throughout the scenario including their presentation in the contest. The change-agent teacher managed to reduce the complexity of the whole endeavour.

Process description: the students read the book, gained information about the 10 pairs of opposites unravelled in the book while wrapping their minds around abstract notions through the different types of activities (see section resources) and exercising their critical judgment.

Impact with regards to school innovation: This scenario in action has:

- Bridged the gap between formal and informal learning (game-based activities were incorporated: hangman, crossword, wordsearch puzzle)
- Fostered collaborative learning and work within groups of students and teachers and across different schools,
- Motivated students to produce written word (through forum and chat), and
- Enhanced teachers' skills and motivation. In particular, pupils were highly motivated by thought-provoking collaborative activities: they could present their ideas, share the results of their assignments and participate in discussions in order to extend their conclusions.

Lessons learnt: A significant enabler was collaboration across schools from different cultures and change management experiences because they facilitated lateral learning (Hargreaves, 2003) between schools. This new paradigm of social learning created new forms of interaction. One of the major features included in the transformed education system, whose contours are coming into view is the presence of "rich, extended models of school organisation using networks and highly varied forms of learning to engage directly with wider communities and jointly produce the wider conditions under which successful educational attainment and learning take place" (Hargreaves, 2003). This scenario in action is the manifestation of this feature.

Links:

- http://meetings.ellak.gr/bigbluebutton/
- http://mathisis.org/
- http://en.linoit.com/

5. Supporting a holistic incorporation of resource-based learning

The ODS methodology is based on the assumption that a school innovation programme that includes the uptake of resource-based learning should not focus exclusively on e-learning *per se*, rather clearly associate it with the overall school development. Resources and digital tools are thus viewed as the tools through which the schools can evolve in all key areas, i.e. Pedagogy, Organisation and Management, Intra-school collaboration among staff, parents and students, Collaboration with other schools, Professional Development of Staff, Resources and Infrastructure, Opening up to the community and Participating in National and European Projects. In this sense, the pilot schools are invited to design a school action plan, in which they describe particular needs that the uptake of resource-based learning will set out to address and to set goals for the development of the school in the five e-maturity development areas: 1) Leadership and Vision, 2) The degree and ways in which ICT is used within and across the curriculum, 3) The overall culture of the school and the prevailing attitudes towards resource-based learning and technology, 4) Professional development of staff, 5) Resources and infrastructure available to the school. Engaging the schools in this process is set out to ensure the schools' ongoing commitment to innovation, by a) fostering their understanding of the benefits that technology can bring into key aspects of the school as organisation, b) assessing the real needs of the school, c) creating a shared vision within the school community, d) training the school staff in designing a development strategy.

6. Putting ideas to practice and opening up the school

In practice, the ODS approach to innovation involves the organization of a series of educational activities that actively engage teachers, pupils and parents, both at national as well as in international level. These activities have been coordinated by the national ODS partners in close collaboration with the schools and have also included external scientific organisations so as to bridge the gap between schools and society. One of the most successful activities are schools' virtual visits to CERN, where pupils are connected online with the ATLAS and the CMS experiments and guided by scientists in the pupils' native languages. This has enabled pupils' interaction with distinguished scientists, as well as for networking among the schools, since multiple schools could simultaneously connect. Online tools, such as the HYPATIA application, are also available to pupils for the collection of actual experimental data from the ATLAS experiment, with the collaboration of the University of Athens (Greece).

Picture 2: The winning photo of the Eratosthenes Photo Contest 2015, by Bojana Habek from Croatia

The Eratosthenes Experiment http://eratosthenes.ea.gr/ has also been a very successful activity, organized for two consecutive years (2014 and 2015). In 2015 it managed to attract 507 schools from 42 countries from all over the world. Pupils from Brazil, Colombia, Chile, the US, China, India, Australia and almost all over Europe collaborated through online communities and groups and exchanged their measurements of the circumference of the Earth, based on the methodology that Eratosthenes introduced back in the 3rd century B.C. Taking the opportunity of the Eratosthenes experiment a photo contest was also organized on this topic, where the ODS platform was also exploited for sharing photos. The winner is granted a scholarship for the ODS Summer school 2015.

In parallel, a national and an international educational scenario contest took place, where ODS teachers were invited to design their own educational scenarios and share them on the ODS platform using the ODS authoring tool[1]. This was supplemented by an innovative schools' contest, that aimed to further motivate the engagement of the ODS schools and encourage them to reflect on their vision for development and present this along with their future goals to the rest of the community. All contest winners are granted with a scholarship for the ODS Summer School.

Pupils' parents are also addressed in an effort to open the school to the community and foster the benefits that parental engagement can bring to pupils' learning. A series of workshops have been organized in Austria, Bulgaria, Greece, Ireland and the UK to train teachers on how to effectively engage the parents particularly through the use of online tools and the ODS platform, while a network of digital communities has been set up to support schools' and parents' collaboration[2].

[1] http://portal.opendiscoveryspace.eu/community/diagonismos-ekpaideytikoy-senarioy-open-discovery-space-2014-15-697749

[2] http://portal.opendiscoveryspace.eu/community/teachers-and-parents-collaborative-community-669875

7. Creating sub- networks within the community

The community building approach of ODS includes not only the support of a large pan- European network, but also the development and support of sub-communities that comprise either local/ national schools or schools that are undertaking activities in common curriculum areas (thematic networks). The idea is to help sustain the expansion of the ODS community of practice and innovation by promoting exceptional schools that function as hubs of innovation, at least at local level. An example of this is the Network of Primary Schools in Magnisia, Greece, that was created in the framework of a joint programme under the title “Good Morning Mr Higgs”. The network, as well as the project, is coordinated by the Primary School of Portaria, which is acting as a change agent school at local level. A key-aspect for the success of these networks is that they are initiated by real school needs. An example for this is the network between two Greek rural Schools on the islands of Gavdos and Karpathos and the Aghios Spyridonas school in Cyprus, that supports online the only 3 pupils of Gavdos, through virtual connections and shared teaching sessions that are delivered online.

8. Guidelines for school leaders and change agents

School innovation is a highly variable concept across countries, educational systems, levels of school autonomy, communities, socioeconomic contexts and school settings and profiles. In order for innovation to be meaningful it is essential for you to carefully assess the current status, its openness to innovation and the needs of school and staff, so as to then design an innovation action plan. Open Discovery Space provides you with tools that will enable you to assess the current status and to set clear goals in key areas that are considered to be important for the overall development of the school as an open learning community. This will enable you to make gradual and sustainable changes that suit your priorities.

Step 1: Assessing the e-maturity of your school

In terms of your school's current familiarization with Information and Communication Technologies, the first step is to illustrate the strengths and weaknesses. Open Discovery Space offers you an e-maturity self-assessment survey for this purpose, which has been adapted based on the work done by the Digital Schools Digital Schools of Distinction Programme in Ireland[3]. By June 2015 it has been completed by more than 1600 schools across Europe and is gradually being adopted as a national assessment tool in countries like Croatia and Bulgaria. The term ICT is used in this survey to refer to the use of Information and Communications Technology in education in general. It is thus meant as an umbrella term to capture all possible kinds of ICT with an emphasis on e-learning applications for teaching and learning.

Take the test in order to assess the current level of your schools' e-maturity in the following 5 particular parameters:

1. *Leadership and vision:* Demonstration of a whole-school ICT policy that outlines a vision and strategy and conveys a positive attitude to the use of ICT in our school. The policy addresses curriculum linkage, planning for structured ICT access for all and Internet safety.
2. *ICT in the curriculum:* Integration of ICT across the curriculum in learning and teaching and staff understand how ICT can be used in the curriculum to improve student learning.
3. *ICT school culture:* Awareness that ICT has an impact on the quality of learning and teaching, pupils' attitudes and behaviour and the wider school community.
4. *Professional development:* Demonstration of the school's commitment to on-going professional development in relation to ICT.
5. *Resources and Infrastructure:* Access to appropriate ICT resources to support particular learning environments.

TIPS

- Think of the members of staff that you will need to consult before completing the survey. Try to involve as many members as possible, e.g. teachers of varying curriculum areas, school grades, ages and teaching experience. Apart from grasping a holistic view of the current status of e-maturity in your school, asking for their views from the outset will engage them and help build a common vision.
- Be as accurate as possible. The survey is intended to help you self-assess and improve your school only and is not used as an external evaluation.
- Save the results and share them with the rest of the school staff. Reflect on them and identify the strengths and weaknesses.
- Retake the survey 6 months after the first time and monitor any shifts. Which steps and activities that you undertook appear to have had an impact?

[3] http://www.digitalschools.ie

Based on the scores, the schools are ranked in 4 categories: e-initial, e-enabled, e-confident and e-mature. Table 1 presents in detail what each level stands for and the equivalencies of each level to the phases of the ODS innovation model. You can access the questionnaire online in 18 languages: English[4], Bulgarian[5], Croatian[6], Danish[7], Dutch[8], Gaelic[9], German[10], Greenlandic[11], Greek[12], Estonian[13], Finnish[14], French[15], Latvian[16], Lithuanian[17], Portuguese[18], Romanian[19], Serbian[20] and Spanish[21].

Step 2: Self-assessment of individual competence profile

While targeting the development of the school as an organization, teachers' professional development should also be addressed in order to make sustainable changes in the quality of teaching and learning. The ODS portal offers you and your school staff a self-assessment tool for your individual competence profile, based on the UNESCO ICT Competency Framework for Teachers[22] (2013). The tool covers individual ICT competences in 6 key areas: 1) Understanding

TIPS

- Fill in your competence profile first and encourage the school staff to do so as well. Depending on the current degree of trust and collaboration in your school, organize a meeting in order to review and reflect on the results, without putting pressure for revealing individual scores. Focus on the areas that your staff needs to further enhance through training.
- Identify national and international training events that suit those needs through the Open Discovery Space platform, e.g. Summer schools and Winter schools for teachers that are funded through ERASMUS+, free online webinars, materials in Teachers' Training Academy and resources available in the communities.
- Take time to ask staff about their career aspirations.
- Set up the community of your school on the Open Discovery Space portal and interact with your teachers on a regular basis in order to enhance more advanced ICT competences. Encourage them to participate in contests that promote ICT skills, e.g. the European Open Discovery Space Digital Educational Scenario Contest http://www.ods-contests.eu/the-ods-contest/rules-of-participation/ .
- Suggest your staff to use the competence profile as a tool that can be used in the framework of ERASMUS+ monitoring processes for participation in-service training activities.

[4] http://e-mature.ea.gr/
[5] http://bulgaria.e-mature.ea.gr/
[6] http://bulgaria.e-mature.ea.gr/
[7] http://denmark.e-mature.ea.gr/
[8] http://dutch.e-mature.ea.gr/
[9] http://ireland.e-mature.ea.gr/
[10] http://german.e-mature.ea.gr/
[11] http://greenlandic.e-mature.ea.gr/
[12] http://greece.e-mature.ea.gr/
[13] http://estonia.e-mature.ea.gr/
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[16] http://latvia.e-mature.ea.gr/
[17] http://lithuania.e-mature.ea.gr/
[18] http://portugal.e-mature.ea.gr/
[19] http://romania.e-mature.ea.gr/
[20] http://serbia.e-mature.ea.gr/
[21] http://spain.e-mature.ea.gr/
[22] http://unesdoc.unesco.org/images/0021/002134/213475e.pdf

ICT in Education, 2) Curriculum and Assessment, 3) Pedagogy, 4) ICT tools, 5) Organisation and Administration, 6) Teacher Professional Development. The overall results indicate 3 levels of competence: *Basic* user, *Advanced* and *Technology Enhanced activities designer.*

Step 3: Develop a school action plan:

After revieing the results of the school's e-maturity and the staff's competence profile, proceed to developing a plan for your future activities that will aim to improve your school in the areas that you identified. Developing such a plan can be quite a demanding task for schools, however European policies are gradually engaging schools in such processes, such as the ERASMUS+ equivalent of the "European School Development Plan" that schools are asked to fill in for staff mobility activities funding. Open Discovery Space provides you with a detailed template that guides you to set goals in key aspects associated with school innovation. By filling in the action plan, you form a strategy for developing in the five e-maturity parameters (see Step 1) in two years' time, that also includes: 1) Collaboration with other schools, policy makers, parents, community or other local agents, 2) Planning of the activities the school will undertake in order to meet the goals, 3) Deciding on the curriculum areas that will be targeted or other aspects associated with pedagogy and school organization, 4) Planning for the resources and tools that will be used, 5) Estimating the pedagogical and technical support they will need, 6) Recording any obstacles and making provision for overcoming them. You can fill in the action plan online in 17 languages: English[23], Bulgarian[24], Croatian[25], Danish[26], Dutch[27], German[28], Greenlandic[29],

[23] http://e-mature.ea.gr/
[24] http://bulgaria.e-mature.ea.gr/
[25] http://bulgaria.e-mature.ea.gr/
[26] http://denmark.e-mature.ea.gr/
[27] http://dutch.e-mature.ea.gr/

Greek[30], Estonian[31], Finnish[32], French[33], Latvian[34], Lithuanian[35], Portuguese[36], Romanian[37], Serbian[38] and Spanish[39].

Helpful resources for school development, innovation and leadership are provided in the Change agents' community of the Open Discovery Space Portal[40]. Feel free to upload your resources and to share your experiences!

TIPS

- Make sure that you have filled in the e-maturity questionnaire in advance (Step1) and have shared the results with your staff.
- Involve as many school staff as possible in the process of building a vision and designing the action plan. If only some of the staff respond, set up a committed group that will participate voluntarily.
- Value your human resources: Make sure you recognise the strengths and limitations of each group member (including yours) and assign clear roles. Think carefully on the process for assigning the key-role of the change-agent teacher. It is advisable that you discuss this first with the group.
- Involve the group of school staff in the action plan design and decision making. You may need to hold several meetings for drafting and reviewing your plan.
- Be clear about the vision and invite the group to contribute to building it.
- Make sure that the action plan responds to real school needs.
- Be proactive: Think of what are you going to prioritize and how you will ensure the sustainability of any benefits.
- Disseminate your action plan to the rest of the school staff, the pupils, parents or other stakeholder and be clear about its rationale and objectives. Ask for their feedback and invite them to support the implementation of the action plan. You can even set up a suggestions box for pupils and staff to comment on the implementation of your activities.
- Communicate any activities, results or achievements of your action plan implementation to local media.
- During the implementation of your planned activities organize regular meetings with the group in order to look for any necessary amendments in the action plan.
- Reflect on your original action plan at the end of the time-frame you had set: What did you achieve? What would you do differently? What are your next steps?

[28] http://german.e-mature.ea.gr/
[29] http://greenlandic.e-mature.ea.gr/
[30] http://greece.e-mature.ea.gr/
[31] http://estonia.e-mature.ea.gr/
[32] http://finland.e-mature.ea.gr/
[33] http://france.e-mature.ea.gr/
[34] http://latvia.e-mature.ea.gr/
[35] http://lithuania.e-mature.ea.gr/
[36] http://portugal.e-mature.ea.gr/
[37] http://romania.e-mature.ea.gr/
[38] http://serbia.e-mature.ea.gr/
[39] http://spain.e-mature.ea.gr/
[40] http://portal.opendiscoveryspace.eu/educational-objects/70112

9. Building strong digital communities in education

Networking among teachers and schools through digital communities of practice are key elements of the ODS approach. Flourishing teaching communities evolve over a period of time to include members that exhibit a sense of belonging, often based on shared beliefs on what constitutes an appropriate educational approach, on the role of the modern pedagogue as an agent and initiator of knowledge and on the value of innovation. These communities of peers also tend to share common aspirations on continuous development and the acquisition of skills and competencies. The later seems to be a rather crucial factor. The stronger the connection between the online community and the most pressing demands and desires of the modern teacher (with a taste for professional development), the more successful the community and its relevant tools and the more meaningful the engagement.

A few tips for healthy online communities of peers:

- **Relevance:** According to (Widenman, 2010): “The single most significant determinant is the perceived clarity and relevance of the community’s purpose and objectives. Without a clearly defined set of goals that are seen to directly address the participating teachers’ intrinsic needs, online Teaching/Learning Communities (TLCs) are likely to fail. Teachers are unlikely to allocate precious time to activities for which the purposes and/or benefits are unclear (Carr & Chambers, 2006). Generic online communities are less likely to succeed than those that specifically target groups of teachers with common needs and interests:”

- **Trust:** Members of newly built TLCs tend to avoid sharing their own material, before establishing a sense of trust that separates true communities of peers from pseudo-communities of members with assumed profiles.

- **Flexibility:** Design your community in a way that allows members a degree of ownership through the provision of a flexible and extensible set of tools and resources that may include both starters and more advanced users (Widenman, 2010).

- **School reform:** Link your communities to school reform.

- **School innovation:** Facilitate exposure to innovations in knowledge, teaching practice, and supporting technologies.

- **Opportunities:** Enable teachers to try out new ideas and skills.

- **Reward:** Schools heads should (even informally) reward teachers for actively participating in communities of peers.

Table 1: Roadmap to school development stages based on the ODS Innovation model

Focus	Key ideas	Initial	E-enabled	E-confident	E-mature
Technology know-how	Impact on teaching and learning of rapid growth of knowledge and information from a technological perspective	General understanding of how technology can improve teaching and learning	Understanding methodologies of how ICT can be integrated into the curriculum	Understand how ICT can improve learning of the curriculum	Design methodologies for integration of technologies in learning
Stimulating	Knowledge of global and local needs and challenges in terms of ICT use and familiarity	An initial map of the basic existing needs of the school is built addressing all the basic needs in terms of equipment, professional development, and its uptake in the institution learning environments.	Schools with already existing ICT infrastructure start designing the necessary professional development and implementation opportunities in the framework of the curricula.	ICT confident school will map the existing opportunities in the school community to engage in exchange projects and enhance learning experiences such as the use of real research in classroom.	Opportunities offered by OER and MOOCs are mapped and a vision for their integration in learning environment built. The school can rehearse innovative student centred models.
	Scan the horizon to search for best practice examples	The map built in the first step is now populated with existing best practice examples in order to design the whole implementation process	Best practice examples are integrated in this phase and teacher will engage in actual implementation exercises	Exploration of research opportunities and engagement of students in real research projects is foreseen for this phase	Innovative experiences, based in existing best practice examples, or new creative opportunities are created in this phase involving students in cutting edge educational research experiences.
	Find innovative examples and partners	Partnership with other institutions that already started their change path towards a more ICT based development is advised at this stage	Interschool collaboration where teachers can implement already successfully tested examples in classroom should be implemented	School can participate for instance in real research campaigns with support of various institutions that promote such possibilities	Schools can design their own experiments and engage students in development of their own projects promoting entrepreneurship skills and ICT innovation.
	Involvement of the community	The school and local community play a major role in ensuring the feasibility of the roadmap designed in the first place. They are the facilitators and key players at stage.	School community is a perfect stage to exchange good examples between peers in the same subject area or for interchange and collaboration between different grade levels and subject areas	The local community can play a very important part in this phase, in particular when stakeholders can support the vision of the school for the uptake of innovative methods and solutions.	School and local communities can be drivers of change in this phase and could/should support the whole vision.
	Receptivity to new ideas	Schools should be opened to the use of ICT innovation for upgrading the teaching/learning process.	Schools should be aware of new ideas and new trends emerging in the field of ICT based education	New forms of learning environments are emerging and the ICT e-confident school should take advantage of cutting edge best practice examples in the field of education	e-mature schools are in a perfect position to pilot new ideas and to create change in the field of education.
	Finding effective communication channels	The whole school community have to be involved in the changes foreseen and continuously informed about the developments taking place	Communication from top-dow and vice-versa should take place at all stages when redesigning the use of existing facilities and roles played by the different stakeholders	e-confident schools can innovate faster and new solutions will pop-up in diverse areas. A proper communication channels has to be designed to ensure maximal uptake of good outcomes	e-mature schools can use modern channels to ensure instant communication between all teams fostering the innovative path in the school

Trials	School proficiency level related to field trial	Teachers have general computer literacy but they do not use it in everyday classroom activities. No systematic teacher training and curriculum/eLearning development program and action plan. Limited access to electronic learning resources. “Drill & Practice” learning/teaching method prevails in the classroom. Community (parents etc.) is not informed/involved in educational activities.	Some experiences in using ICT tools in the classroom. Teamwork and some active learning elements are used in the classroom. Growing confidence among teachers how to use new learning methods. Teachers are starting to share learning ideas with each other and inform parents.	ICT confident school uses actively new pupil centered learning methodologies. Schools development program and action plan is followed. School participates in online learning events and is taking lead/coordination in more simple events. School is working actively to set up good relations with parents and community around the school	Teachers/school has extensive experiences in using new learning methodologies and ICT and they have participated in collaborative online learning events and research projects. Teachers have experiences and understanding about cultures (cultural differences) in countries involved with projects.
	The level of complexity of field trials	Designing elearning development plan and teacher training programme. Using simple electronic presentation and content in the classroom.	Participating in intra-school, intra-region learning events and contests (quizzes etc.). Making learning flexible in the classroom though using interactive / electronic content and programs	Filed trials, which engage pupils and teachers into more simple learning events internationally and more systematic collaborative project in own region / country. Starting to organize/coordinate learning events on their own.	Taking part in different online collaborative learning events, also the ones, which last months and involve synchronous communication and series of activities (like storytelling projects etc.) and often also travels.
	Organisational “to-do list”	Preparing elearning development plan and teacher training programme in the school. Searching for contacts, teacher training opportunities. Upgrading school's ICT infrastructure. Involving/informing community (parents) into development plans of the school.	Starting to implement development plan, selecting filed trials, which require collaboration between classes and learning situations. Actively participating in teacher training events, networking events, information days.	Participating in different online learning events and trials. Coordinating events on regional level and simple events also multiculturally.	Maintaining and developing learning contacts in all levels. Coordinating learning events and participating in them. Functioning like a regional innovation centre and sharing experiences.
Incubating	Sustainability Active	Focus on short term Provide classical assessment method and limited feedback	Focus on medium term Improve classical assessment methods and improve feedback	Focus on long term Provide a ground for self-assessment	Focus on organic community to auto-administer Use digital resources for students to interact as peer and provide feedback
	Support	Get support from workshop organization	Get support from author of the resources	Get support from a community	Provides support to a community
	Localization	Use downloaded resources directly	Minor localization to downloaded resources	Major localization to downloaded resources	Contribute back to the community with a guide and support for successful localization
	Versatility	Use downloaded resources directly	Minor changes to downloaded resources	Major changes to downloaded resources	Contribute with own resources
Accelerating	Dissemination and diffusion	Headmasters organize some basic presentations and workshops about ODS. They appoint an e-Learning ODS team.	The e-Learning ODS team develops e-Learning vision with the help of the headmaster.	E-learning vision is integraded into the school curriculum.	E-learning is implemented in classrooms. Both eachers and students use it.
	Motivation	Headmasters find funds for a couple of teachers who will be sent to some basic e-Learning trainings, seminars or academies.	The trained teachers train the interested groups of teachers in school.	All of the teachers are trained to use e-Learning systems.	The teachers implement e-Learning in their classrooms, prepare demonstration lessons and get points for professional development.

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