CO-DESIGNING 21ST CENTURY SECONDARY SCHOOL NATURAL SCIENCE LEARNING ENVIRONMENTS

http://keyconet.eun.org
KeyCoNet (2012 – 2014) is a European policy network focused on identifying and analyzing initiatives on the implementation of key competences in primary and secondary school education.

On the basis of the evidence collected through literature reviews, case studies, peer learning visits, country overviews, videos and exchanges between network members, the project’s final objective is to produce recommendations for policy and practice regarding the enablers and obstacles to a holistic implementation of key competence development.

Among KeyCoNet’s current 18 partners in 10 countries (Austria, Belgium, Estonia, Finland, France, Ireland, Norway, Portugal, Spain and Sweden), are Ministries of Education/related agencies, universities/research institutes, European organizations, and practice related partners. KeyCoNet also has a growing number of associate members from other countries and stakeholder groups, steadily increasing our network’s scope and influence.
# CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>About this Case Study</td>
<td>6</td>
</tr>
<tr>
<td>Basic Information</td>
<td>8</td>
</tr>
<tr>
<td>Summary</td>
<td>10</td>
</tr>
<tr>
<td>Introduction</td>
<td>12</td>
</tr>
<tr>
<td>1. Contextual Influence</td>
<td>16</td>
</tr>
<tr>
<td>2. Substance Related Issues</td>
<td>19</td>
</tr>
<tr>
<td>3. Partnership Related Issues</td>
<td>19</td>
</tr>
<tr>
<td>4. Strategy Related Issues</td>
<td>21</td>
</tr>
<tr>
<td>5. Mainstreaming Related Issues</td>
<td>23</td>
</tr>
<tr>
<td>6. Systemic Aspects</td>
<td>24</td>
</tr>
<tr>
<td>7. Evaluation Related Issues</td>
<td>28</td>
</tr>
<tr>
<td>8. Achievement of Initiatives Aim</td>
<td>29</td>
</tr>
<tr>
<td>9. Next Steps</td>
<td>30</td>
</tr>
</tbody>
</table>
ABOUT THIS CASE STUDY

Part of a series
This case study is part of a series of case studies being produced by KeyCoNet, to highlight various initiatives concerning key competence development, taking place across Europe. Each case study analyzes the initiative’s implementation strategies in depth, and will feed into the network’s recommendations for policy and practice on how to implement a key competence approach in schools most effectively.

How and why was this case selected?
Each year the KeyCoNet network identifies initiatives concerning key competence development across Europe, and a case note is produced providing basic information about each one. Following this, network partners participate in an online selection according to pre-established criteria, as well as an in-depth face-to-face discussion, in order to select the most interesting initiatives to develop into case studies.

This Finnish case study is about one school’s experience of the Co-Designing Learning Environments project which aimed at adapting the school’s physical learning environment to better support the teaching and learning of key competences considered important for the 21st century. This initiative was selected by the network for case study development because of its focus on analyzing how changing a learning environment physically can facilitate the teaching and learning of all key competences in an explicit, thought out way. Its innovative, participatory approach whereby the new learning environment was co-designed and co-developed simultaneously with internal (school staff and students) and external (the Jyväskylä Teacher Training School and architectural, interior design and furniture companies) stakeholders, was also considered of particular interest.

Which methodology has been used?
Case studies are the main tool used by the network to probe beneath the surface of each selected initiative and provide a rich context for understanding the implementation issues involved. The initiatives selected by the network differ in many ways, according to the nature of the key competences addressed, the implementation process used, the number of students and teachers directly concerned, the type and number of actors involved, and the duration and stage of development etc. A multiple-case study design, whereby each initiative generates its own case study, but uses one single prism for a common analysis, was therefore chosen. This method makes it possible to explore diversity, as well as the enablers and obstacles to the initiative’s implementation, as perceived by the initiators and stakeholders interviewed. Moreover, through a multiple-case study design it is possible to identify choices, strategies, characteristics, situations or contexts leading to success or failure in a recurrent manner. This will particularly contribute to fuelling the set of recommendations for policy and practice at institutional, local, regional, national and European level, for the effective implementation of key competences in school education.

Each case study included interviews with the initiative’s coordinators and stakeholders, as well as desk research. In some cases, where considered feasible and fruitful, focus groups were also organized. For this particular case study, four people have been initially interviewed: the executive Head, the pedagogical head, leader of work package 4 of Indoor Environments programme and a researcher. These stakeholders belong to two different target groups: two of them are representatives of school management and two of them are research partners. They were chosen because they have been involved in this project from the beginning and because they represent key partners for the initiative.
BASIC INFORMATION

Country: Finland
Title of initiative: [FI] Käyttäjälähtöinen oppimistilasuunnittelu [EN] Co-designing Learning Environments
Coordinator/Organization: University of Jyväskylä, Agora Center
Key competences addressed: [FI] Kommunikointi äidinkielellä [EN] Communication in the mother tongue
[FI] Matemaattinen, tieteellinen ja teknologinen kompetenssi [EN] Mathematical competence and basic competences in science and technology
[FI] Digitaalinen kompetenssi [EN] Digital competence
[FI] Oppimaaan oppiminen [EN] Learning to learn
[FI] Sosiaalisuuteen ja kansalaisuuuteen liittyvä taidot [EN] Social and civic competence
[FI] Aloitteellisuus ja yrittäjyyys [EN] Sense of initiative and entrepreneurship

Type of initiative and channels used for implementation (e.g. curriculum reform introduced through legislation etc.)
Theoretical and practical model of the 21st century learning environment

Partners:
- Jyväskylä Teacher Training School
- University Properties of Finland Ltd.

Scope:
School level
Local

Learning context:
(formal or non-formal)
Formal

School education level(s):
(primary, lower secondary, upper secondary)
Upper secondary

Target groups:
Students, teachers

Time frame:
(start and end date)
6 August 2012 to 31 December 2013

Relevant links:
- Agora Center: https://agoracenter.jyu.fi/
- University of Jyväskylä Teacher Training School: www.norssi.jyu.fi/
The Co-Designing Learning Environments project aims to adapt physical learning environments in order to better support the teaching and learning of key competences that are important for the 21st century. This is a cross-curricular project (visual arts, physics, chemistry, mathematics, ICT, mother tongue and literature, English and Spanish) but is conducted mainly as a part of the visual arts course. During the project there is a focus on all eight key competences but the ultimate objective is for these competences to be even more conscientiously included in the teaching and learning process after the reforms.

Goals and standards are defined together with different stakeholders but are based on previous research on ideal learning environments.

The goals of the project are

- to transform the natural science classroom and its closely connected hallway into a space that enables diversified learning and the adoption of all eight key competences;
- to involve the members of the school community in the transformation process by means of a user-centred co-design and development process for any schools involved in the project.

The approach is systemic and holistic, with changes designed in harmony with the vision and the mission of the school and social practises and new infrastructure co-designed and co-developed simultaneously with internal and external stakeholders.

After the co-design and the reforms, support will be offered to teachers for the implementation of new practises and evaluation of the impact will be based mainly on qualitative data (e.g. user perception and user experiences). Furthermore, the possible scalability of the project will be analysed.
INTRODUCTION

The Co-Designing Learning Environments project aims at adapting physical learning environments to better support the teaching and learning of the key competences considered important for the 21st century. The project is part of Work Package 4: Environments for Learning and Creation of New Knowledge of the national Indoor Environments programme. The main project partners of the Co-Designing Learning Environments subproject are the University of Jyväskylä (Agora Center), University Properties of Finland Ltd., and the University of Jyväskylä Teacher Training School. The project is coordinated by the University of Jyväskylä, and University Properties of Finland provides guidelines and is responsible for the construction of facilities. The University of Jyväskylä Teacher Training School is the end-user of the new learning spaces, which are co-designed for secondary school natural science studies.

The main objectives of co-designing the secondary school natural science classroom and hallway at the University of Jyväskylä Teacher Training School are 1) to transform the natural science classroom and its closely connected hallway into a space that enables diversified learning and the adaption of all key competences, and 2) to involve members of the school community in the design of the space through user-centred co-design and development. From a research perspective, the first objective is related to developing substantial design principles regarding the optimal 21st century learning spaces, while the second objective is related to developing procedural design principles for user-centred co-design projects.

Although the project aims at supporting the teaching and learning of all eight key competences, the main focus is on mathematical competence and basic competences in science and technology and in digital competence. The use of ICT is also seen as a particularly useful tool in teaching and learning other key competences, such as communication, social competence and sense of initiative. Key competences for lifelong learning are fostered by, for example, the design of motivating, inspiring, stimulating and comfortable spaces that actively support multiple ways of learning, both formal and informal. The objective is also to create possibilities for continuous learning processes that are independent of space and time. Furthermore, although the emphasis of the Finnish natural science curriculum is already on applied natural sciences, and approaches such as learning by doing and phenomenon-based learning as well as laboratory experiments are already part of studies, the aim is to create solutions that relate phenomena more closely to students’ everyday lives and help them to create closer connections between theory and practice.

The approach of the research project is systemic and holistic: the changes are designed in harmony with the school’s vision and mission, and social practices and the new infrastructure are simultaneously co-designed and co-developed with internal and external stakeholders. Changes have been designed based on the shared, recent understanding of 21st century teaching and learning, but the aim is to build upon existing curricula and good practices, without fully abandoning...
tradition. Due to the specific function of this school, the dimension of teacher-training has been naturally included in the project.

Design produced by architectural firm LPV Jyväskylä and interior designer Liisa Lundell.

The theoretical framework and research methods employed are based on previous research on ideal learning environments\(^5\). Learning environments are considered to be multilevel ecosystems that shape the conditions for learning in a specific time and space. The development of all dimensions of space, including physical, virtual, social and personal interrelated and interconnected space, is considered relevant. After the co-design and redevelopment of the space, support will be offered to teachers and students for the implementation of new practices. The evaluation of the impact will be mainly based on qualitative data (e.g. user perception, user experiences and video ethnography). Furthermore, the possible scalability of the project will also be analysed.

The project was launched in August 2012 and will continue until the end of December 2013. New natural science learning environments are co-designed with upper secondary school students, teachers and student teachers. Firstly, upper secondary students designed the natural science learning space in a project course led by researchers, and after the course all students of the school had the chance to vote for the best plan. In spring 2013 the focus has been on designing spaces with the school administration, teachers and student teachers, while further design work is being carried out by design professionals. The project implementation will take place in summer 2013 and alternations to the space will be completed. During autumn 2013 the focus will be studying the uptake and effectiveness of the newly renovated natural science learning spaces.

This report is based on interviews with the following four stakeholders:

1. Leader of Work Package 4 of the Indoor Environments programme: Spaces for learning and creating of new knowledge, University Properties of Finland Lt.

2. Executive Head of the University of Jyväskylä Teacher Training School.

3. Pedagogical Head of the University of Jyväskylä Teacher Training School’s Upper Secondary School.

4. Educational researcher participating in the project at Agora Center, University of Jyväskylä.

---

\(^5\) For a quick review of recent studies in this field, see e.g. UNESCO (2012), A Place to learn: Lessons from Research on Learning Environments, Technical Paper No. 9. Available from: http://unesdoc.unesco.org/images/0021/002154/215468e.pdf
1. CONTEXTUAL INFLUENCE

Which contextual factors have been perceived as enablers to the implementation of the initiative, and why?

The Finnish national Indoor Environments programme and its Work Package 4: Environments for Learning and Creation of New Knowledge led by University Properties of Finland Ltd. is the most relevant enabler of this project in terms of providing both guidelines and the financial framework for the project. Projects related to the Work Package 4 aim to contribute to the internationally recognised need to update learning environments in order to better support 21st century teaching and learning. During the interview, the leader of Work Package 4 explained that creating a network of different universities and other partners together with the funding received from Tekes (Finnish Funding Agency for Technology and Innovation) enabled the programme’s overall budget to be increased. This, in turn, made possible the creation of demo spaces all over Finland. For this particular project, University Properties of Finland Ltd. and the University of Jyväskylä Teacher Training School both invested 100,000 euro in order to enable the structural changes of the space.

The shared interests of the Indoor Environments programme and the teacher training school is another important enabler of this initiative. In the interview, the Executive Head of the training school mentioned that this project helped to advance the fundamental work carried out at the school. The project was in line with the school’s previous development projects, which have particularly focused on ICT in teaching and learning. The project was also seen as an opportunity to augment the usability and utilisation of the relatively large hallway next to the natural science classroom.

Furthermore, the project is in line with the ongoing development of the basic education and upper secondary school curricula in Finland. As an example of the changes that have been brought about in the educational context, the national matriculation examination (a necessary qualification for beginning academic studies at university), is planned to be partially conducted in digital format in 2016 and to be fully digital by 2019. This is an additional contextual factor that urges all schools to support the development of students’ digital competences.

Finally, every year there are 40 to 50 math and natural science student teachers following their teacher training in this space. The pedagogical head of the upper secondary school explains that a survey conducted in the school in 2012 revealed that about 20% of student teachers did not own a laptop and also suggested that student teachers cannot automatically be considered ‘digital natives’. This project is seen as a way to support the development of future teachers’ technological and digital competences, which are considered indispensable in 21st century teaching.

Which contextual factors have been perceived as obstacles to the implementation of the initiative, and why?

The interviewed stakeholders did not talk directly about obstacles but rather saw that there were challenges that could be overcome through smart strategic thinking as well as with fluent coordination and collaboration. For example, social practices and new infrastructure are designed and developed simultaneously, since the physical space can be designed in a way that enables it to be adapted to suit multiple ways of teaching and learning. The leader of Work Package 4 of Indoor Environments pointed out that the development of the space was designed to enable it to be adaptable to multiple teaching styles and that this was a key enabler of the project.
Environments programme of University Properties of Finland Ltd. mentioned that spaces have traditionally been designed for one purpose only and the space intuitively directs people towards specific behaviours. For instance, auditoriums were designed for listening to lectures when information could not be reached textually or through multimedia, and it was important for libraries to be spaces of complete silence as access to literature was still restricted and the library was a place for reading. In the 21st century, it may be more productive to watch a lecture and read a book alone, and then come together in a common space to share and reflect on the lessons learned and to collaboratively create new ideas. This, however, requires spaces that are designed to support 21st century ways of working instead of fostering traditional patterns of behaviour.

In addition to the challenges that 20th century physical learning environments pose to 21st century learning, one of the biggest challenges in this kind of project is the high cost of the structural changes, furniture and educational technology. It has also been somewhat challenging to obtain the time and dedication needed for participatory design. Finally, some bureaucratic issues related to obtaining official permission (university licence for the project) have also slowed down the implementation process. For this reason there have been challenges in terms of following the original schedule. Luckily, however, none of these challenges have inhibited the progress of the initiative.

### 2. Substance Related Issues

Which substance related issues have been the most difficult to fix when deciding on the content of the initiative, and why?

During her interview, the educational researcher participating in the project stated that working in a multidisciplinary team that aims to take into account the needs of profoundly different user-groups and to create a holistic view of 21st century learning spaces has made it relatively difficult to define the main approaches, contents and objectives of this project. Frequent, open and democratic discussions have been needed to overcome these difficulties.

### 3. Partnership Related Issues

Which key aspects should be taken into consideration when defining the partnership?

First of all, the leader of Work Package 4 of Indoor Environments programme of University Properties of Finland Ltd. highlighted the importance of networking and the creation of strategic partnerships with organisations with different types of expertise who are willing to share and spread their knowledge. In his opinion, it is especially important to involve the director of the university and the university’s strategic team as well as researchers in this kind of project. In this case, the 21st century learning demo spaces were chosen from among the educational institutions owned by University Properties of Finland Ltd. The University of Jyväskylä Teacher Training School Design produced by architects’ firm LPV Jyväskylä and interior designer Liisa Lundell.
accepted the invitation as a chance to be ‘at the crest of the wave’ leading the way in innovative practices. The researcher stated that in demo cases such as this, it is important to find partners that are genuinely willing to adapt and develop their way of working. This can be considered as a second important aspect when choosing partners.

Some of the key factors behind the successful collaboration were identified as the clear definition of the roles of each stakeholder from the beginning of the project, as well as the mutual trust in each partners’ expertise in their field. Pre-existing relations between different stakeholders have also helped in establishing fluent collaboration between the different partners. In any case, there is a need for frequent and regular meetings with different stakeholders. The coordinators’ work was also seen as crucial in keeping the project manageable. The stakeholders interviewed thought that the roles and division of tasks were clear, that cooperation was fluent and effective, and that it was relatively easy to reach consensus between partners. As an example of role divisions during this project, the school management gave recommendations regarding equipment and furniture providers but as they considered that University Properties of Finland Ltd. had sufficient expertise and contacts in order to choose designers for the project, they felt there was no need to intervene in these decisions.

During her interview the pedagogical head of the upper secondary school mentioned that although organisational aspects are important, the real key to success is effective collaboration and team work among people with a similar mind-set. She also sees this kind of project as an opportunity to learn from the different expertise of various people, provided that the experts in different areas find a common language and are able to explain their viewpoint to people that are not familiar with their field of expertise. This allows the team to be more than a sum of its parts.

4. STRATEGY RELATED ISSUES

Which aspects of the strategy implemented for the initiative have proved to be particularly effective, and why?

The Indoor Environments programme aims at creating, within one project, different demo spaces all over Finland, facilitating sharing and the co-creation of new knowledge about ideal learning environments. Findings from these demos and case studies can then be exploited in different contexts both nationally and internationally. The executive head of the teacher training school stated that relatively small experiments within one school can already help to calculate whether there are enough positive outcomes in comparison to the level of input and investment. In this way, limited resources can be used in an intelligent and effective way. If a minor experiment leads to good outcomes, it can be rolled out, first within the school and then gradually to basic education as a whole and, finally, partly to vocational or tertiary education. Furthermore, the leader of the Indoor Environments Work Package 4 stated that innovation requires both trials and careful analysis of the impact of the changes. The ‘evidence based design’ approach has been used in the programme in order to clearly understand how different space solutions influence human behaviour and learning outcomes instead of, for example, simply designing spaces based on certain architectural trends.
In this initiative there has been a mix of bottom-up and top-down approaches – internal and external stakeholders along with the main users and the administration were invited to join the participatory, democratic and user-centred design process. The educational researcher commented that the participatory co-design used in this project had helped provide a better understanding of different user perspectives and had enhanced user engagement. The project also aimed to diminish possible resistance to change as well as the possible gap between official goals and the goals as understood by teachers or students. She also stated that the integration of co-design activities in the curriculum and ordinary schoolwork was an excellent way of conducting the sessions as participants did not perceive co-designing as an extra burden, but as an opportunity to influence their own working environment. Agreements were reached so that students who participated in the design project course received marks for their visual art course, Environment, Place and Space, instead of studying for the course in the traditional way. Teachers, in turn, have been able to dedicate some of their weekly meeting time to the project.

The pedagogical head of the upper secondary school felt that in this project everybody was on the same level and participants had together found ideas that could be developed. Also, according to the executive head of the teacher training school, innovative practices can only be created together with different stakeholders through animated discussion. The representatives of the school administration interviewed think, however, that this strategy would not have been successful without an operational culture where participation in different projects is encouraged. This kind of culture has been consciously created by the school administration.

Which aspects of the strategy implemented for the initiative have proven to be most problematic, and why?

The leader of Indoor Environments Work Package 4 stated that creating brave, innovative solutions and working with different kinds of strategic partners naturally brought some problems, such as resistance to change, but said that these problems were minor in comparison with the positive changes, improvements and development brought by this kind of strategy.

5. MAINSTREAMING RELATED ISSUES

If the key competence initiative aims/aimed at mainstreaming, what are/have been the major obstacles encountered to generalise it?

The leader of Work Package 4 stated that it is not always easy to abandon old ways of working (e.g. focus on individual work) and move towards new ways of working (e.g. co-working, multidisciplinary work and sharing resources). Sometimes changes happen only after organisations see the positive outcome from the new ways of working implemented by a few innovative organisations. This can make mainstreaming slow. He also thinks that although there is an interest in creating similar programmes between different European universities and a network of innovative European universities that could be used as a strategic tool for renewing European education and societies as a whole, the structures of European universities remain untouchable and no one dares attempt to change them. This can even be an obstacle when aiming
to spread innovation and to maintain and increase the competitiveness of the continent.

The researcher states that finding the time and other resources for co-designing can make mainstreaming difficult – the same amount of dedication and resources may not, for example, be available in schools nationwide. She thinks, however, that the process could be simplified in order to make it more feasible in cases where no extra-resources are available.

6. SYSTEMIC ASPECTS

To what extent has the initiative been designed as a systemic one from the starting point, i.e. introducing changes in several areas related to the student curriculum (such as teacher training, assessment, school organisation, etc.)?

This project does not aim at modifying the system but changes are designed within a system. As the project is conducted in the teacher training school it is directly connected to teacher education. The pedagogical head of the upper secondary school commented that, in general, student teachers are more flexible in their ways of working and more easily able to adopt innovative practices than more experienced teachers. These practices can therefore be spread throughout Finland through newly graduated teachers.

Systemic thinking can actually be much more than just thinking of the educational system as a separate system in society. The leader of Work Package 4 of Indoor Environments programme stated that playing during early childhood, learning at school, post-compulsory studies or working after studies should not be seen as separate from each another but rather learning experiences should be designed so that the joy of learning by experimenting and playing, i.e. simulating real life situations, is present in lifelong learning.

Systemic thinking and a holistic approach to improving learning processes must also take into account issues such as health and comfort in learning environments. There is, for example, a need to improve the quality of the indoor air of learning spaces. Other studies by the Indoor Environments programme have found that the quality of the air is much better in open spaces than in closed spaces such as the classroom. Interestingly, this also indicates that ‘learning beyond the classroom’ projects can actually be justified as being beneficial to health.

What have been the enablers encountered during the implementation because of the systemic aspect of the initiative?

In general, the Finnish school system is known for its flexibility in comparison to many other school systems, and schools have a great deal of autonomy and freedom. The Finnish national curriculum also defines cross-curricular themes, which are very similar to the key competences. The educational researcher commented that although more systematic attention should be paid to teaching, learning and assessing key competences in Finland also, the flexibility of the curriculum allows a focus on learning these wider competences instead of, for example, simply concentrating on the restricted content tested in
standardised examinations. Also the matriculation examination at the end of upper secondary school focuses very much on higher order thinking skills instead of merely on limited content. Interestingly, the pedagogical head of the upper secondary school comments that the flexibility and autonomy of the Finnish school system can also be an obstacle for development as, although it provides opportunities for different stakeholders to apply new ways of teaching and learning, it also allows schools to stick to existing routines. Luckily this has not been the case at this school.

What have been the obstacles and/or challenges encountered during the implementation because of the systemic aspect of the initiative?

The infinite number of different factors affecting the outcomes makes systemic and holistic approach very challenging and also leaves space for unexpected – even negative – effects both in the short- and long-term. It is challenging to try to consolidate all the different aspects and to assure that the requirements of different system levels or the opinions of different user-groups and stakeholders are taken into account in the final design.

How have the obstacles and/or challenges encountered been overcome?

Concentrating on one user perspective and phase at a time – without forgetting the bigger picture – has helped in overcoming the challenges of such a multidimensional project.

Have some parts of the original design of the initiative [from the systemic point of view] been abandoned and why?

Some structural changes to the physical environment that were initially planned were abandoned due to high costs. These changes can, however, be implemented at a later stage. More sessions with teacher and student teacher involvement could have been organised if there had not been delays in obtaining official permission for the project. Nevertheless, these examples illustrate the importance of creating a flexible design that can be adapted to changing circumstances and unexpected occurrences.

If no systemic approach was thought of from the beginning, or if some components had to be abandoned during the implementation, would a step-by-step [or area by area] implementation be advisable, i.e. starting with introducing changes supporting key competences in one area and then introducing related changes in the other areas, and why?

Stakeholders interviewed seem to share the idea that in many cases evolution is a better approach than revolution – changes need time and they need to be planned carefully in order to lead to success and to avoid serious mistakes. The researcher pointed out that this is sometimes mentioned as one of the characteristics of Finnish educational system.
7. EVALUATION RELATED ISSUES

In case a simultaneous/real time evaluation process has been part of the initiative:

What have been the obstacles to implement it, and why?
Creating complicated (external) evaluation procedures was not considered necessary; instead the evaluation process was kept as natural and simple as possible. There has been constant informal formative self-evaluation, internal peer-to-peer evaluation (students, teachers, student teachers and administration) and also feedback from external experts. However, this kind of evaluation would have not been possible without an in-depth knowledge of the operational environment.

What have been the difficulties or risks that have been solved/avoided thanks to the simultaneous evaluation process, and why?
Constant formative evaluation and self-evaluation has helped to identify weak aspects of the design and to fix them as quickly as possible. It has also helped in making decisions on how to move forward. On some occasions evaluation also showed that it was necessary to take a step back and abandon some previously planned aspects of the project, as mentioned previously.

8. ACHIEVEMENT OF INITIATIVES AIM

Have the original aims of the initiative been achieved?
The leader of Work Package 4 thinks that in the Indoor Environments project, experimenting with spaces has led to innovative solutions that would have not been found in other ways. This particular project is still in progress, but preliminary design principles concerning ideal 21st century learning environments and participatory methods have been successfully developed during the 2012-2013 school year. It has also been possible to include different internal stakeholders (administration, teachers, student teachers and students) and external stakeholders (researchers, University Properties of Finland Ltd., constructor, designers, companies, etc.) in the design and development of new spaces. Inviting end-users to participate in designing their own learning environments has already increased their interest in the project and its outcomes. Moreover, the pedagogical head of the upper secondary school explains how the use of ICT in classrooms has already increased participation, communication, involvement and peer-to-peer learning in classes in comparison to traditional natural science classes, where often about 5 students out of 25 tend to participate actively while ‘the rest just nod their heads’. After the reforms have taken place (summer 2013) researchers will conduct an effectiveness evaluation, which will reveal whether the original aims have been achieved.
9. NEXT STEPS

What is planned next for the initiative?

After the changes have been implemented, the researchers will analyse the uptake of the new space into the school’s processes and evaluate the effectiveness of the changes. Researchers will analyse, for example, whether users perceive an improvement in the spaces and if they perceive that their perspective has been included in the final design. Researchers will also analyse how the changes have impacted teaching and learning practices and interaction, particularly in terms of key competences. The possible scalability of the project will also be analysed. All stakeholders think that if a minor experiment leads to positive outcomes it can be rolled out on a larger scale.

The school administration is planning to disseminate the results through the school’s own publication series (which features published reports and articles about the research, development and pilot projects). In terms of research, the results will be disseminated in international and national publications, dissertations and master’s theses. The project will also be presented in different conferences and to different visitors.
European Schoolnet is the coordinator of the KeyCoNet Project.

European Schoolnet is the network of 30 European Ministries of Education, based in Brussels. As a not-for-profit organisation, we aim to bring innovation in teaching and learning to our key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners.

Since its founding in 1997, European Schoolnet has used its links with education ministries to help schools make effective use of educational technologies, equipping both teachers and pupils with the skills to achieve in the knowledge society.

In particular, European Schoolnet pledges to:

- Support schools in achieving effective use of ICT in teaching and learning
- Improve and raise the quality of education in Europe
- Promote the European dimension in education

The KeyCoNet project has been funded with support from the Lifelong Learning Programme of the European Commission. Responsibility for this publication lies solely with the author, and the Commission is not responsible for any use which may be made of the information contained therein.