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GUIDANCE NOTE
FOR TEACHERS AND SCHOOL MANAGERS

FROM CREATIVITY TO INITIATIVE
BUILDING ENTREPRENEURIAL COMPETENCIES IN
SCHOOLS
TABLE OF CONTENTS

INTRODUCTION................................................................................................................. 8
  Developing entrepreneurial competencies through education................................. 9
THE ENTREPRENEURIAL SCHOOL ................................................................................. 11
  Getting started with building the entrepreneurial school ...................................... 11
  A progressive model for entrepreneurial education ................................................. 12
  Parents and role models .......................................................................................... 13
  Entrepreneurial learning environments .................................................................. 14
  Summary of key issues, further readings and examples ......................................... 15
THE OUTWARD LOOKING SCHOOL AND ITS ECOSYSTEM ............................................. 17
  A model to understand and design entrepreneurship education ecosystems ......... 17
  Summary of key issues, further readings and examples ......................................... 19
RESOURCES FOR ENTREPRENEURIAL EDUCATION ....................................................... 20
  Additional time, peer support and other resources ............................................... 21
  Continuing professional development to sustain a changed role for teachers ......... 22
  Summary of key issues, further readings and examples ......................................... 24
ENTREPRENEURIAL EDUCATION IN PRACTICE .............................................................. 26
  About, through and for entrepreneurship: learning by creating value ................... 26
  Conventional versus entrepreneurial teaching approaches .................................. 28
  Understanding how emotion impacts on learning and performance .................... 30
  Assessment in entrepreneurial education ............................................................... 31
  Summary of key issues, further readings and examples ......................................... 32
CONCLUSIONS ............................................................................................................... 35
REFERENCES ................................................................................................................. 36

Tables

Table 1. The Entrepreneurial School: issues, readings, examples ................................. 15
Table 2. Collaboration with the outside world: issues, readings, examples ............... 20
Table 3. Requirements for collaboration with externals in education .......................... 21
Table 4. Resources for entrepreneurial education: issues, readings, examples ....... 25
Table 5. Conventional versus entrepreneurial approaches to teaching and education .. 28
Table 6. Implementation versus innovation assessment issues .................................... 31
Table 7. Entrepreneurial education in practice: issues, readings, examples ............... 33

Figures

Figure 1. Three-step progression model of entrepreneurial education ...................... 12
Figure 2. A model to understand and design entrepreneurship education ecosystems... 18
Figure 3. Interconnected domains of teacher’s growth .............................................. 24
Figure 4. Overview of terms and definitions currently used in entrepreneurial education. 27
INTRODUCTION

Entrepreneurial individuals demonstrate initiative, they learn through trial-and-error processes, rely on their own judgements, while taking into account other opinions and being aware of likely consequences; and they create their own job environments. Developing in schools the underlying set of attitudes, skills and knowledge – which we summarise here as entrepreneurial competencies – will be beneficial for all learners, regardless of whether they will join existing organisations as employees or managers, become self-employed or eventually run their own entrepreneurial firms.

The European Commission defined the sense of initiative and entrepreneurship as one of eight key transversal competencies, which can and should be developed through formal education and lifelong learning activities. The aim is to build the willingness and ability of individuals to "turn ideas into action. It involves creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. The individual is aware of the context of his/her work and is able to seize opportunities that arise. It is the foundation for acquiring more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance".¹

All eight transversal competencies include cognitive and non-cognitive skills. Non-cognitive skills, such as motivation, socio-emotional regulation, time preference and personality (Heckmann, 2008), have important effects on both school attainment and labour market outcomes (Brunello and Schlotter, 2011). The foundations for these skills are laid early on in education. Family, friends, the cultural and the socio-economic context of an individual also influence the occupational choice, the ambition to succeed, and the willingness to start again after a failure.

Education plays thus a core role in providing early orientation about future occupation. There are significant differences across the OECD area as to how relevant young people perceive the role of school education in developing a sense of entrepreneurial spirit, ranging from above 75% in Brazil, Norway and Portugal to less than 20% in Japan (OECD, 2013). This suggests that it matters "how" entrepreneurial competencies are developed in schools, that is, the content, format and learning environments of entrepreneurial education, and the actors shaping these.

Teachers, who are agents of change, can be recognised by their impact on the learner and on the school. And, successful schools and colleges will receive recognition in the same way as their students will. Numerous activities are underway to build effective learning environments for entrepreneurial competencies. Common success factors are leadership and governance, flexibility of curriculum, extra-curricular learning opportunities, community engagement, the involvement of businesses and entrepreneurs in education, and close links with the local entrepreneurship support system. However, substantial variations exist between and within countries in whether and how entrepreneurial education is implemented. Differences include the degree to which experiential learning is offered, the accessibility and quality of training for teachers and repositories of teaching materials, incentives for

educators and students to engage in extra-curricular activities dedicated to entrepreneurship, and the engagement with external partners.

In this guidance note, we will focus on those factors influencing entrepreneurial education, which can be shaped by the school, that is, educational design, learning environments, the role of the teacher, and the school's collaboration with its surrounding environment. We will first discuss the need and rationale for developing entrepreneurial competencies through education before we then review key recent literature and empirical studies on what constitutes the entrepreneurial school, its collaborations with the surrounding world (the outward looking school), resources for entrepreneurial education, and entrepreneurial education in practice. Each of these chapters ends with a summary of key issues in which the reader is guided towards further readings, which were prepared by educational researchers and entrepreneurial education experts within the framework of the Entrepreneurship360 initiative, and case studies of entrepreneurial education in practice, which were collected and analysed as part of the initiative. In a final chapter the central arguments presented in this paper are summarised.

Developing entrepreneurial competencies through education

Being entrepreneurial can mean many things. It does not exclusively refer to the creation of new firms (entrepreneurship) but also to how employees approach their tasks (intrapreneurship), and ways individuals act in everyday life. There is a striking similarity between the sense of initiative and entrepreneurship as a key transversal competency and certain non-cognitive skills, such as critical thinking, problem solving, social skills, persistence, creativity, and self-control (e.g., Farrington et al., 2012; Lackéus, 2015).

In absence of a common definition of what promoting entrepreneurship through education means, reference can be made to the narrow and wide understanding of entrepreneurship. The narrow understanding of entrepreneurship refers to the creation of new firms, whereas the wide understanding is about personal development, creativity, self-reliance, initiative taking, action orientation, i.e. becoming entrepreneurial. The narrow understanding is mainly relevant at higher levels of education and in elective secondary school courses which focus on learning about business start-up and management. This corresponds to education about entrepreneurship as well as for entrepreneurship, which we will come back to later this note. The wide understanding of entrepreneurship builds on the entrepreneurial mind-set and "life skills", which any citizen needs in a rapidly changing world. This corresponds to education through entrepreneurship, which is the most relevant and, as Sagar (2015) and other argue, the only understanding of entrepreneurship for primary school levels. We will come back to this in the section Entrepreneurial Education in Practice.

Teachers and school managers may hold their own views of entrepreneurship. It will therefore be crucial to identify and establish a common understanding and to establish the objectives of entrepreneurial education in order to avoid what Leffler (2009) called a "battle fought in the language used, where the economists own the concepts of the entrepreneur and entrepreneurship, and the schools own the concepts of pedagogy".

Promoting entrepreneurial competencies through education requires sufficient space in the curriculum to accommodate the two overarching and co-existing learning objectives: "being entrepreneurial" and "becoming an entrepreneur". Traditional educational design and pedagogy are too focused on developing content knowledge and analytical thinking, and therefore not well suited to enhance non-cognitive skills and entrepreneurial competencies, which experiential learning, and interactions with the surrounding world can bring to students. School managers and teachers play crucial roles in co-designing learning environments, which build entrepreneurial competencies in an integral and transversal way across all aspects of education. To achieve this, systemic changes may be
needed to delegate greater decision-making power to individual schools in the organisation of education, and to create incentives for effective local partnerships, which bring together the resources, interests and activities of different actors.

The situational dimension of learning is crucial for achievement of expected learning outcomes. Sagar (2015) illustrates this with the example of science and technology education in schools, which is generally adjusted to fit into the school organisation and the requirements of assessment rather than being shaped into a simplified version of science with true inquiries, deliberations and based on critical thinking. Moreover, science teachers and their students only rarely see scientists at work. Consequently, many school activities do not make sense if transferred to "real-life" practices in science and technology. This has a negative impact on the motivation of students, which, however, are interested in the societal relevance of science and technology. Being able to read and understand newspaper articles which discuss certain aspects of science and technology, is an example of a task, which is framed in an authentic or real-life context. It mimics a situation, in which the student in h/er role as citizen needs to possess content knowledge in order to take and maintain a standpoint on factual grounds and to actively participate in debates.

Students who benefit from authentic learning – Sagar (2015) presents the example of a space shuttle artefact as learning environment – persevere to a higher degree even if initially they may feel confused and frustrated. Students continue a course of action even in the face of difficulty granted that there is a proper balance between the challenge and its appropriateness; perseverance and motivation are even larger when assignments resemble real-life situations. In authentic learning, students develop the ability to distinguish reliable from unreliable information and to recognise relevant, familiar patterns in unfamiliar contexts. They gain patience to follow longer arguments and the flexibility to work across disciplinary and cultural boundaries. Acquiring on their own, that is, without assistance, these "portable skills" (Lombardi, 2007) is for newcomers to any discipline almost impossible. Hence, teachers have a crucial role in authentic learning. Their task is to translate and remodel scientific knowledge, which is developed in laboratories, and make it relevant for the learner. Read a practitioner-oriented overview authentic learning in Sagar (2015).

Krueger (2015) reminded us that the aim of education is to help learners move from a more novice mind-set toward a more expert mind-set. This requires looking at deep cognitive change. The starting point is to define carefully and rigorously the dimensions of the entrepreneurial mind-set at a deep level beyond behaviours, beyond intent. A review of the practitioner and academic literatures in entrepreneurship, however, tells surprisingly little about what constitutes the entrepreneurial mind-set, especially the expert entrepreneurial mind-set. We know that mind-sets reflect deep, but malleable cognitive structures, which can be measured indirectly through surface level markers (Dweck, 2006). Entering into a discussion of what this implies for educational design, and in particular for assessment, goes beyond the scope of this paper, but a detailed discussion is presented in Krueger 2015.

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THE ENTREPRENEURIAL SCHOOL

In an "entrepreneurial school", students are central actors of education; they are encouraged and supported to co-design, co-educate and co-assess education activities, within a framework adapted to the students' age and abilities. Teachers collaborate with students in experimenting and reflecting different approaches to learning and assessment. It is important to take into account that the teachers’ professionally related perceptions and attitudes are strong determinants for how learning environments get shaped in practice. We will come back to this later in this note.

For secondary and vocational schools being successful in developing entrepreneurial competencies can imply a raise in reputation and attractiveness both towards employers and students. Good performance of students will increase their employability and chances for professional success. In turn, this is likely to generate more requests from possible employers for closer relationships with the school and, on the long run, admission and completion rates are likely to go up.

Institutional guidance and quality management frameworks are important for the creation of the entrepreneurial school, in which the development of entrepreneurial competencies is part of the school's culture, embedded in the fabric of the student experience, and reflected by an overall "can do" approach both in the formal and in the "hidden" curricula. Ruskovaara, Pihkala and Hoare (2015) argued that such frameworks should be based on a four-fold approach that provides a tool to monitor and evaluate the institutional culture inside the school, and its external environment (e.g., key partners and types of partnerships), student learning processes and outcomes, and the readiness and preparedness of teachers and school managers to change. There are a number of frameworks, which fit different contexts and serve different purposes, see Ruskovaara, Pihkala and Hoare (2015) for an overview including the feedback of different user groups.

Getting started with building the entrepreneurial school

Open and continuing debates, involving parents, education partners, other teachers, school management, and students are crucial for the establishment of a common understanding of entrepreneurship and adequate learning environments. In this, school management has a leading role. Group discussions can be a promising route to establish a system of institutional guidance and quality management for entrepreneurial education. Discussions can open new views on what entrepreneurship means for the school and its cultural and socio-economic context; they can play a crucial role when assessing the current situation, and can be used as development tool.

However, there are some drawbacks of group discussions, as Ruskovaara, Pihkala and Hoare (2015) highlighted. It is crucial to acknowledge the fact that the participants greatly influence how the discussion evolves and what is discussed. For example, when the school management participates, it is likely that many discussants will highlight issues that they presume school management wants them to bring up. Depending on the group dynamics, certain participants will have a stronger influence on the direction, pace and results than others; and some actors may also remain excluded. When such inclusion barriers are properly addressed, group discussions can, however, lead to development plans and concrete actions. See Ruskovaara, Pihkala and Hoare (2015) for a list of starter-questions and possible answers to manage a group discussion about entrepreneurial education.
A progressive model for entrepreneurial education

Promoting the two overarching learning objectives of entrepreneurial education – "being entrepreneurial" and "becoming an entrepreneur" – is best achieved through a progression model (European Commission, 2010; Blenker et al., 2011; Rasmussen and Nybye, 2013), which allows for a gradual change of content, pedagogy, learning outcomes and assessment strategies, according to the needs, readiness and interests of the learners, and the extent to which the school provides occupational orientation.

Applying a progressive approach to entrepreneurial education means that learning objectives will be different for primary, secondary, higher levels of education and for vocational education and training. The Entrepreneurship360 background report (Lackéus, 2015) presents a progression model (Figure 1) with three steps building on the notions of educating through entrepreneurship (first step), about & through (second step), and about, for & through (third step).

Figure 1. Three-step progression model of entrepreneurial education

In the first step, which could start at the age of 6-7 years, students learn to take actions to address societal challenges and everyday problems based on their own interests and ideas. Here, entrepreneurial education is integrated into the core subjects and not treated as separate subject in order to develop entrepreneurial competencies in the form of critical thinking, problem solving, social skills, perseverance, creativity and self-control, and to spur deep learning. This responds to the claim that primary education plays an important role in developing and nurturing non-cognitive skills, initiative and entrepreneurship as a key competence (European Commission, 2011), which has been taken up in education practices throughout Europe.\(^4\)

\(^4\) According to Eurodyce (2012), almost two-third of the 28 EU member countries have entrepreneurship objectives in their primary school curriculum as transversal and horizontal issues. In many countries entrepreneurship is taught as part of history, geography and civic education.
The second and third steps are located in secondary and vocational schools, where the aim is to prepare students for their successful labour market entry or continued education. Here, students are at a crossroad, where many will continue with activities that build entrepreneurial competencies, but with a greater focus on subject knowledge, for example, financial literacy. For those students, who are interested in learning more about how to start and run a firm, additional courses are offered with a greater focus on business language, practices and entrepreneurship skills. A common format is the so-called "mini companies" where students start and run their own simulated or real businesses, supported by teachers, for a certain amount of time (e.g., one per week for one school year). See the 2005 EC report on mini-companies in secondary education.

In entrepreneurship-specific activities, the teacher plays a central role in enhancing the technical knowledge and skills of students to create and manage a firm, such as, for example, understanding financial break even points and undertaking effective market research. Buying and selling can render financial decision-making more relevant to the learner not only through the actual handling of money, but also through handling group dynamics. As Penaluna and Penaluna (2015) pointed out, it is less important for teachers to be able to give exact answers, as almost certainly the complexities of real-life situations makes any formal / advisory role unrealistic, but more to be aware of, and to explain the implications of issues such as copyright, trademarking, design rights, patenting, and the role of ethics in doing business.

Finally, in the third step, students are prepared to make an informed choice about their future professional careers. Education activities are more focused on business knowledge and entrepreneurship skills. Especially, in vocational education and training, and in higher education, students should learn about innovation management, business growth models and internationalisation in order to be able to become, if it is their choice, an "intrapreneur" in an existing organisation or to start a new or take over an existing firm.

Parents and role models

Penaluna and Penaluna (2015) reminded us that often there are stakeholders inside the school, who are willing to support students’ progress, but may feel as "outsiders" of the system and that any personal intervention is inappropriate, whereas the opposite is probably true. Engaging an entrepreneurial parent, who runs h/her own business could is a way of developing new projects, identifying specific learning outcomes and designing new ways of assessment. Teachers and parents are important role models5 and because the brain mirrors what it sees, visual messages that we receive with little effort, subconsciously lead to mimicking (Blakemore and Frith, 2005). Acting upon observations is a type of learning without active teaching. For example, a parent with a small local shop that sells groceries could ask students what new products could go onto the shelf, or offer insights into what sells most and what doesn’t, and for what reasons. A local garage owner could explain how difficult it is to recycle car tyres, and ask students to offer alternatives to landfill that make better use of the day-to-day product that everyone takes for granted. See Alakylan kolu case study.

An example of how schools can be supported to involve parents in the educational process, is Ready Unlimited, a not-for-profit social enterprise in Rotherham/UK, that runs the "Are You Ready" programme, which has created several hubs across England to improve the collaboration of teachers, parents and the wider community. The school principal of Herringthorpe infant school in Rotherham,

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5 Role models imply that people identify with other people that they connect with within social roles, and the matching of psychological and cognitive skills that lead to imitation that is evidenced through patterns of behaviour. See Penaluna and Penaluna (2015) for a detailed discussion.
who participated in one of the trainings, reported the evolving success of parent-teacher interaction through the so-called Parent Teacher Groups and their engagement with local businesses through a simple message of relevance: "If the parents and broader stakeholders saw relevance in what the children were learning, then learning continued beyond the classroom into the community." Read Penaluna and Penaluna (2015) for a detailed discussion of the above and more examples.

**Entrepreneurial learning environments**

To identify what could change in learning environments to make them more effective in developing entrepreneurial competencies, Sagar (2015) suggested a distinction between the physical room and the mental room of a learning environment. The physical room can take many forms and locations both inside and outside the school's premises. Examples are the classroom, the laboratory, the mechanical workshop, the hospital ward, the neighbouring forest, factories, and businesses as well as the Internet. Some of the most commonly utilised physical rooms of the schools that participated in the OECD-EC capacity building seminar in November 2014 in Potsdam include premises all over the school premises and in its close proximity, such as a near-by forest, park, a farm, a factory, businesses, museums or a public library. Less often used are Skype and other virtual communication spaces, trade fairs, shopping malls, sports clubs, the church and students’ homes.

Collaboration across different age groups and generations introduce yet another dimension to the physical room, such as, for example, a community centre for the elderly or joint classrooms activities of younger and older students. Physical spaces can also be created by re-engineering existing rooms, for example by making the school hall an expo or breech out space. Classrooms can be used differently by re-organising tables and chairs according to assignment needs. A comprehensive school in Finland, covering grades 1-12, has worked purposefully on re-arranging the classrooms by purchasing couches and round tables to promote team work, triangular tables, which can be easily turned into a circular shape and tables with flexible heights. In this school, all secondary-level classes are located on the same floor. All doors are opening to a common hall, which students can use to study and work in groups. An open-space lounge was created with sofas, a microwave oven, a coffee machine and a water kettle. Students can work in the lounge also during lessons. The same school is currently adding a new building, which was designed to facilitate flexible learning environments with glass walls, open spaces, social areas and plenty of small conference rooms, which can be utilised by teachers as well as students. In small and sound-proof examination rooms students will be able to take computerised exams, if they wish to do so. See Sagar (2015) for a detailed discussion, and Peetri basic school case study for an example.

The mental room can be understood as a representation of the teaching methods, contexts and content utilised by the teacher. This includes the type of assignments and the extent to which they allow for and encourage own initiatives of students, creativity and responsibility, how open they are to multiple solutions, and how relevant they are to the student. The mental room also includes the settings of the learning process, such as the share of individual and team work, group discussions, self- and peer-assessment and how students employ their knowledge and skills in written tests, oral presentations in class and to external audiences. The teacher’s interpretation of the curriculum and h/her teaching experience are fundamental factors which shape the mental room. For an illustration of the concept of the learning environment’s mental room, we can look at the example of a Danish elementary school, which has opted for a shift in focus towards the utilisation of skills and knowledge.

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6 From 2-6 November 2015 the OECD LEED Programme organised in collaboration with the European Commission and the OECD Forum on Partnerships and Local Development a capacity building on how to promote entrepreneurial learning in schools. Delegates came from 27 schools (4 primary, 14 secondary, 9 VET schools), several municipalities, local partnerships, and school boards.
in processes which create value for others and in which every child is acknowledged and recognised as unique resource in the learning process. The overall aim is to empower the students. Another example is a comprehensive school in the UK, whose overall motto is "Ask it!"; central to teaching and learning are enquiry-led approaches, in which students are involved in the planning of the classes.

Teachers are the main source of influence for both the physical and the mental rooms of the learning environment. It is important that teachers feel trusted and supported from school management when they innovate their teaching and the learning environment. This may require extra time and other resources (e.g., use of school premises outside class hours). But, teachers do not act independently. Collaboration with the surrounding world, support from school management and colleagues, the motivation of students and the involvement of parents are important factors in shaping learning environments, too.

The learning environment plays an important role in developing "reasonable adventurers" and "knowledge harvesters" – which is how Penaluna and Penaluna (2015) describe entrepreneurial students. This requires reflection in class about learning that takes place outside of the classroom, for example during intense periods of thought and reflection (e.g., internships, societal activities, taking care of an elderly person, etc.). Understanding personal creativity, and the periods in which the mind is best placed to come up with new and innovative insights, should also inform the curriculum and its development. People often have their best ideas in periods of relaxed cognition (Claxton, 2008) such as mowing the lawn or walking the dog.

**Summary of key issues, further readings and examples**

In the entrepreneurial school, students are central actors of education. Within a framework, which is adapted to age and ability requirements, students are encouraged and supported to co-design, co-educate and co-assess education activities. Ideally, all learners get involved, and entrepreneurial education activities progressively build on each other to allow for gradual change of content, pedagogy, learning outcomes and assessment strategies, according to the needs, readiness and interests of the learners and the educational level of the schools.

Open and continuing debates, involving parents, education partners, other teachers, school management, and students are crucial for the establishment of a common understanding of entrepreneurship and adequate learning environments. In this, school management has a leading role. Teachers need to feel trusted and supported from school management when they change their educational design. Other important factors in building the entrepreneurial school are collaboration with the surrounding world, support from school management and colleagues, the motivation of students and the involvement of parents.

Table 1 provides an overview of key issues, which emerged from the discussion in this chapter, suggestions of who could take a leading role amongst teachers and school management, and further readings and case studies.

<table>
<thead>
<tr>
<th>Key issues</th>
<th>School management</th>
<th>Teachers</th>
<th>Further readings</th>
<th>Further readings</th>
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<td></td>
<td></td>
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<td>E360 Thematic Papers</td>
<td>E360 Case Study</td>
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</tbody>
</table>

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7 See Ure Friskole case study at http://www.oecd.org/site/entrepreneurship360/initiatives.
## Entrepreneurial education is present in all subjects.

- Sagar (2015)
- Penaluna & Penaluna (2015)
- Alakylän Koulu (Finland)
- Koninklijk Technisch Ateneum (Netherlands)
- Peetri basic school (Estonia)

## The school offers entrepreneurial education progressively to all learners.

- Sagar (2015)
- Penaluna & Penaluna (2015)
- Veljko Drobnjaković (Montenegro)
- Alakylän Koulu (Finland)
- Highfurlong (UK/England)
- Internatschule Schloss Hansenberg (Germany)
- Lenné Gesamtschule Potsdam (Germany)
- San Jose de Calasanz Ikastetxea (Basque/Spain)

## Entrepreneurial education is an integral part of the school's identity, ethos and culture.

- Ruskovaara, Pihkala & Hoare (2015)
- Veljko Drobnjaković (Montenegro)
- Internatschule Schloss Hansenberg (Germany)

## Incentives are in place for teachers to engage in entrepreneurial education.

- Ruskovaara, Pihkala & Hoare (2015)
- Penaluna & Penaluna (2015)
- Sagar (2015)
- Veljko Drobnjaković (Montenegro)
- Internatschule Schloss Hansenberg (Germany)

## Learners can choose part of their courses, either as extra-curricular activities or as electives.

- Penaluna & Penaluna (2015)
- Sagar (2015)
- Highfurlong (UK/England)
- Lenné Gesamtschule Potsdam (Germany)

## There is a leader or a leading team that sustains and promotes entrepreneurial education.

- Ruskovaara, Pihkala & Hoare (2015)
- Penaluna & Penaluna (2015)
- Sagar (2015)
- Veljko Drobnjaković (Montenegro)
- Highfurlong (UK/England)
- Landesgymnasium für Hochbegabte Schwäbisch Gmünd

## The importance given to entrepreneurial education is widely communicated within the school.

- Penanluna & Penaluna (2015)
- Sagar (2015)
- Highfurlong (UK/England)
- Lenné Gesamtschule Potsdam (Germany)

## The importance of entrepreneurial education in the school is widely communicated with partners and the local community.

- Ruskovaara, Pihkala & Hoare (2015)
- Sagar (2015)
- Highfurlong (UK/England)
- Landesgymnasium für Hochbegabte Schwäbisch Gmünd
- San Jose de Calasanz Ikastetxea (Basque/Spain)

## The importance of entrepreneurial education is widely communicated with parents.

- Sagar (2015)
- Penaluna & Penaluna (2015)
- Highfurlong (UK/England)
- Alakylän Koulu (Finland)

## Cooperation of learners across classes is encouraged.

- Sagar (2015)
- Penaluna & Penaluna (2015)
- Alakylän Koulu (Finland)
THE OUTWARD LOOKING SCHOOL AND ITS ECOSYSTEM

The entrepreneurial school is an outward looking school. With the aim of making education more relevant and effective, the entire school gets connected with its surrounding world. Both teachers and students can be key networkers. Another way of connecting the school to its surrounding world, is, as Sagar (2015) presented, to regularly complement school text books with other sources of information, such as expert presentations, newspaper articles, information from businesses and industry organisations, and civil society actors, social media, the Internet, etc. An obvious requirement for students and teachers is the in-depth critical review and reflection in class of this information and its sources.

Today, schools are greatly expanding their connections to the outside world, also in response to requests from public policy. An example is the European Commission's recommendation that all young people should "benefit from at least one practical entrepreneurial experience before leaving compulsory education" (European Commission, 2012). This makes school collaborations with external actors essential for entrepreneurial education and school managers and teachers need a greater understanding of what generates, drives and sustains educational links beyond the physical borders of the classroom and the school.

A model to understand and design entrepreneurship education ecosystems

Every school ecosystem is unique. It involves different actors with their institutional contexts, expectations and resources. To fully understand learning environments inside and outside a school, Toutain and Mueller (2015) suggested the use of the conceptual framework of an "ecosystem" and presented a model with five dimensions, including (i) framework, (ii) networks & connections, (iii) culture, (iv) pedagogy, and (v) spaces (Figure 1). Each of these dimensions will bring in specific actors and resources, but at the same time it is important to consider the dynamics and mutual influences between the dimensions. Read an introductory summary of an educational ecosystem in Toutain and Mueller (2015).

Key drivers of school ecosystems are the motivations of its actors, which can be both intrinsic and extrinsic. Intrinsic motivation does not need external stimulation. For example, a teacher with a personal interest in arts will establish a class in arts & entrepreneurship together with local artists because he/she feels intrinsically motivated and will benefit from combining pleasure and duty. The extrinsic motivation of an individual, instead, is the result of actions, constructed and guided by other individuals or framework conditions, which the motivated individual has to comply with. For example, if the local school board has created an award for innovative pedagogies, participating in the award becomes a social recognition for all members of the local education community, that is, for the teachers and the awarded schools, the students and their families, the school board and all other stakeholders.
Extrinsic and intrinsic forms of motivation influence each other. The social recognition from an award may incite teachers to create (more) entrepreneurial education activities. The intrinsic motivation of a teacher and resulting outstanding initiatives are likely to inspire also colleagues (i.e., create intrinsic motivation) or other schools and public policy organisations to develop similar activities (i.e., create extrinsic motivation). To understand the role of motivation and its potential levers, essential questions to ask are what are the benefits and consequences are for the different actors in the system, and what are the (perceived) benefits.

Figure 2. A model to understand and design entrepreneurship education ecosystems

![Figure 2](image-url)


In the following, the five dimensions of the model are briefly introduced (Figure 2). The reader will find in Toutain and Mueller (2015) for each dimension a set of short case studies and a self-assessment exercise that helps teachers and school managers to identify what could be changed, and which actors and what resources should be involved.

The framework dimension looks into how the partners of the outward looking school are involved in the various steps of education and how learners are supported in creating value based on the needs of the society and/or the local community (more on the concept of value-creation in the section on Entrepreneurial Education in Practice).

Learning spaces can also be distinguished by who manages them, that is, teachers, the school, or students. In schools, which have highly modular, transparent and non-hierarchical forms of learning spaces, interaction and exchange across all levels is possible and enhanced because traditional hierarchies are absent. In this way, access for and collaboration with external actors is facilitated. Some schools allow students to "own" the learning space through a self-organised design and management process.

There is a great variety in the nature and intensity of the types of connections (projects of various duration, systematic involvement in design, delivery and assessment, paid contracts, etc.) that a school is creating and maintaining with external actors (e.g., individuals, associations, entrepreneurs, government representatives, etc.). Some schools connect and network only within the school environment (across disciplines and with other schools inside the common association or governance), whereas others have created a strong and broad network beyond the organisational borders of the school, spanning local, regional, national and international levels.

Following the understanding that culture is created and defined at group level and maintained through shared values and meanings, Toutain and Mueller (2015) defined the entrepreneurial culture of a school's ecosystem as the capacity of the school and its internal and external actors to interact and
create, share and develop a common language. Language is understood here in a wider sense and touches on shared meanings and behaviours and a common vision for society. The entrepreneurial culture of a school will impact on how learners – during and after their education – will connect with the world outside classroom. When the aim is to establish a common entrepreneurial culture of a school it is important to take into account the overall learning objectives and the school's vision to identify most appropriate actions in terms of resources and stakeholder buy-in. Each school will have a unique entrepreneurial culture. According to Toutain and Mueller (2015) schools may emphasise one or several of the following:

- Construction of an individualistic world view and the awareness of personal resources to transform the world (e.g. artistic expression of entrepreneurial ideas as in Scherdin and Zander, 2011).

- Focus on the creation of social and/or societal values. Projects of learners are oriented towards social rather than economic issues (e.g., development and environmental challenges, intergenerational fairness, gender equality, etc.).

- Promoting an entrepreneurial culture that is defined by action, decision making and performance – usually with a focus on tangible outputs, such as the number of objects sold, number of networks created, ideas implemented, etc.

Certain pedagogies enhance the concept of an outward looking school more than others. For example, experiential learning can be used as a bridge between external partners, teachers and learners, and encourage learners to take actions based on their own interests, values and ideas. Toutain and Mueller (2015) identified two main commonalities. Firstly, the systematic use of collaborative approaches. In learning, collaboration between students is a priority in reflecting upon the educational experiences learners make outside the classroom. Collaboration with externals in education can range from a one-time company visit to full integration into learning outcome definition and assessment, and can be initiated either by the teacher or by the students. The second recurrent issue is the anchoring of learning in real-world situations, that is, immersing students into the socio-economic reality outside the classroom. From a pedagogical point of view, selling a product or service outside the protecting walls of a school building can be a highly stimulating learning experience that can also help to alleviate fear of social connections and failure.

Krueger (2015) concluded from a review of several entrepreneurship-specific education activities, that the highly experiential ones are remarkably embedded, even immersed, in the local entrepreneurial community. This immersion facilitates deep learning on multiple fronts and generates entrepreneurial competences and skills for entrepreneurship at the same time. Moreover, the best programmes exhibit co-immersion, that is, the entrepreneurial community is embedded in the programme. See Krueger (2015) for a detailed discussion.

Summary of key issues, further readings and examples

With the aim of making education more relevant and effective, the entire school gets connected with its surrounding world. Every school has a unique ecosystem, which involves different actors with their expectations and resources. Bringing all this together into an effective education system, which reflects issues of societal and local relevance, requires a concerted approach of school management, teachers, parents and partners, and the involvement of students to make education relevant.
Table 2 provides an overview of key issues, which emerged from the discussion in this chapter, suggestions of who could take a leading role amongst teachers and school management, and further readings and case studies.

<table>
<thead>
<tr>
<th>Key issues</th>
<th>School management</th>
<th>Teachers</th>
<th>Further readings</th>
<th>RESOURCES FOR ENTREPRENEURIAL EDUCATION</th>
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<tbody>
<tr>
<td>The school knows the actors of its local environment, their respective roles, interactions and potentials for collaboration.</td>
<td></td>
<td>Toutain &amp; Mueller (2015)</td>
<td>San Jose de Calasanz Ikastetxea (Basque/Spain)</td>
<td>A common understanding of what entrepreneurship means for a specific school will be the result of a long-term process that involves debate, trial and error approaches, and a strong partnership with</td>
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<td>The school actively shapes a positive image towards its local environment and seeks regular feedback about how this image is perceived.</td>
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<td>Toutain &amp; Mueller (2015)</td>
<td>Highburlong (UK/England)</td>
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<td>The school has established relationships with a variety of external actors that provide useful and valuable contributions to education. Teachers take a leading role in this.</td>
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<td>Toutain &amp; Mueller (2015)</td>
<td>Veljko Drobnjaković (Montenegro)</td>
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<td>Partners are involved in the design and delivery of entrepreneurial education activities, in the definition of learning outcomes and in assessment.</td>
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<td>Sagar (2015)</td>
<td>Alakylän Koulu (Finland)</td>
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<tr>
<td>Learning spaces are available for collaborative activities of learners, teachers and partners.</td>
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<td>Lenné Gesamtschule Potsdam (Germany)</td>
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<td>Drivkraft Söderhamn (Sweden)</td>
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<td>Alakylän Koulu (Finland)</td>
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</table>
parents, business partners and the local community. Entrepreneurial education can be organised in single activities, which may or may not be linked with each other and it can be a teaching principle throughout the curriculum. The bandwidth between single activities and curriculum integration may vary from school to school and also amongst teachers within the same school.

Once a common understanding is in place or in its formation, resources will need to be allocated in a sustainable way and capacities developed across all subjects. Pedagogic discussions and collaborative teacher development can help steering entrepreneurial education away from single, unconnected activities towards greater curriculum integration. School management can facilitate this by enhancing synergies between different education activities, and facilitating collaboration with the surrounding world. Often neglected, but a key element of effective capacity building, is the sharing of expertise across traditional boundaries (e.g., economics and arts). Stakeholder mapping and network charts, which evolve and develop over time, are good examples of how the iterative building of relationships can be evidenced and monitored. Read more about capacity building across traditional boundaries in Penaluna and Penaluna (2015).

Additional time, peer support and other resources

As we discussed in the previous chapter, collaboration with the surrounding world is a key component of entrepreneurial education. Establishing and maintaining contacts and embedding them in the education process is, however, not easy and often teachers express the need for (more) support from school management. Sagar (2015) concluded from an empirical study of primary, secondary and VET school teachers in Sweden that the main concerns include the need for more time, the role of teachers' attitudes towards collaboration with external actors, the influence of colleagues, the expectations of external actors, the general social-economic situation, transportation issues, and the role of training and continuing professional development. Table 3 presents for each of these the main issues stated by the surveyed teachers.

Table 3. Requirements for collaboration with externals in education

<table>
<thead>
<tr>
<th>Main concern…</th>
<th>… which includes issues around:</th>
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| **School management** | • Student group size  
| | • Students with 'special needs'  
| | • General organisation  
| | • General flexibility  
| | • Scheduling of optional education activities  
| | • Decision making  
| | • Clarity of objectives and goals  
| **Time** | • For planning individually and together with colleagues  
| | • For carrying out the plan  
| | • To reflect and adjust to new approaches  
| | • To make contacts with the surrounding world  
| **Teacher’s personal character traits and disposition** | • Courage to:  
| | – Try out something new  
| | – Break norms and traditions  
| | – Let go of control  
| | – “Fail”/“Trial and Error” approaches  
| | • Engagement, curiosity and interest  
| | • Will to change things  
| | • Ability to take initiative/to recognize possibilities  
| | • Self-confidence and Pro-activeness  
| | • Creativity and Imagination |
• Empathy
• Being a positive role model

**Colleagues**
• Joint participation and decision making
• Coherent views on teaching and education
• Positive attitude in general and towards changes specifically
• Ability to listen to and understand each other’s different situations
• Support and generosity

**Actors in the surrounding world**
• Positive attitude
• Win-win collaborations
• In close vicinity
• Network of contacts
• Administrative simplicity

**Conditions of the surrounding world**
• General socio-economic conditions
• Transportation

**Continuing Professional Development**
• Inspiration
• Change in attitudes and approaches

Source: Adapted from Sagar, Pendrill and Wallin (2011).

Time is a key resource for entrepreneurial education. It takes time to adjust to new ways of thinking and teaching and to build more cross-subject synergies. It also takes time for teachers and school managers to change professionally related perceptions and attitudes. In particular, for teachers not having enough time to try out new teaching styles and education designs, to evaluate and re-design them before they are formally added to the teaching requirements is a common concern.

This does not necessarily mean the need for extra time. As Sagar (2015) pointed out, what counts is to have the flexibility to prioritise the time given both individually as well as collectively. Here, organisational changes can facilitate synergies across different subjects and cohorts and with the surrounding world. Time, in this sense, together with pedagogical discussions, peer learning and teacher collaboration can enhance curriculum integration of entrepreneurial education. Read Sagar (2015) for examples from different countries.

**Continuing professional development to sustain a changed role for teachers**

The professional knowledge base of teachers includes a specific set of knowledge and skills. Shulman (1987) differentiates seven types of knowledge: (i) content knowledge; (ii) general pedagogical knowledge (including classroom management); (iii) curriculum knowledge; (iv) pedagogical content knowledge; (v) knowledge of learners and their characteristics; (vi) knowledge of educational contexts, ranging from the workings of the group or classroom, the governance and financing of school districts, to the character of communities and cultures; and (vii) knowledge of educational ends, purposes and values. Knowledge structures are anchored in our deep beliefs that are usually well below the surface. Changing knowledge structures thus requires changing those deep beliefs, often in discontinuous fashion. In education, this is constructivistic learning as opposed to the traditional behaviouristic learning model that emphasises knowledge content (Löbler 2006; Krueger 2009, Neergaard, et al. 2012). See Krueger (2015) for a detailed discussion.

Adopting an entrepreneurial education design will require teachers to change some of the above mentioned knowledge bases, such as for example, classroom management, pedagogical content knowledge, which brings together content and pedagogy, and the knowledge of the philosophical and historical grounds of educational ends, purposes and values. To this end, the WEF Global Education Initiative report (Volkmann et al., 2009) suggested that multidisciplinary business content and
experiential approaches should become an integral part of teacher training in order to build a good understanding of the changing needs of businesses and society. For example, having done an internship in a firm, will make it easier for teachers to use real-life experiences and engage entrepreneurs and industry people in education (European Commission, 2009).

In entrepreneurial education, teachers act more as facilitators and coaches, guiding the student rather than giving instructions. Penaluna and Penaluna (2015) described the successful entrepreneurial teacher as one who can facilitate authentic and context learning by breaking down barriers, acting as a catalyst for ideas, and who can spot the ‘pain points’, i.e., where significant problems are apparent, and act upon them, if needed also by mobilising a team of facilitators and coaches.

As Penaluna and Penaluna (2015) reminded us, new insights will not evolve from doing the same things in the same way, but can only be generated by change and adaptation, and the understanding that more problems are equal to more opportunities for innovative responses. For a content-driven approach to education, which foresees that the teacher is evaluated on what content h/she has created and delivery was managed, this can, however, be a significant challenge. Read more about this and an introductory overview of a developmental approach to education from pedagogy, which is teacher-centred and teacher oriented, to andragogy, which is centred on the learner, and heutogogy, in which objective setting is student-determined, in Penaluna and Penaluna (2015).

Teachers, who show resistance or hesitation towards entrepreneurial education, may change perceptions and attitudes more easily with the help of open discussions of what entrepreneurship means and what the aims of entrepreneurial education are. As Sagar (2015) reckoned, the political and economic connotations of entrepreneurship, and "the entrepreneur" (as the heroic and innovative male, who prefers to act in solitude for monetary profits, i.e., "the capitalist") are often causing resistance of teachers. These connotations should be addressed through open pedagogic discussions and professional development so as to provide wide access to information and knowledge that will allow teachers to make a more balanced and context-related judgement. Backström-Widjeskog (2008) found from a study of secondary school teachers in Finland that the exposure to a wide range of information about entrepreneurship and entrepreneurial education resulted in teachers seeing also the latter's relevance for the development of non-cognitive skills and occupational orientation.

A real change in the teaching will, however, only occur only after the teacher has observed and experienced the benefits of a different educational design on the students' learning outcome (Guskey, 2002). Central elements for professional development for teachers are therefore "what to teach", "how to teach", and "what changes in students' learning outcomes can be achieved". According to empirical research (e.g., Clarke and Hollingsworth, 2002), teacher's growth occurs through the mediating processes of reflection and enactment involving four domains of change (Figure 3), which include the personal domain of change, based on the teacher's knowledge, beliefs, attitudes and perceptions, the external domain, including the variety of sources from outside the classroom, the domain of teaching practice, and the domain of consequence, that is, the outcomes of changes on student's learning, intrinsic motivation and interests.

Teacher's growth is a long-term and multi-dimensional process. To be effective, changes will need to happen in several domains. Teacher change is highly individual and should thus have individually tailored objectives. Effectiveness as well as the pace and paths of growth will vary amongst trained teachers, even when the external domain of change for them is the same or very similar. Feedback by peers, in a secure and trust-based environment and following specific aims, can be a powerful tool for professional growth (William, 2012). As Sagar (2015) found, supportive peers and colleagues may also compensate the lack of support from school management. However, since forces in the learning community can be both enabling and inhibiting individual teacher growth,
awareness and caution are needed when building learning communities to ensure, as Elmore (1996) suggested, a mixture of sceptical and committed teachers. Read Sagar (2015) for a detailed discussion and a list of critical success factors for continuous professional development.

**Figure 3. Interconnected domains of teacher’s growth**

Source: Adapted from Clarke and Hollingsworth (2002).

**Summary of key issues, further readings and examples**

What entrepreneurship means for a specific school will be the result of a long-term process that involves debate, trial and error approaches, and a strong partnership with parents, business partners and the local community. The next step will be to allocate resources in a sustainable way and to develop capacities across all subjects.

In entrepreneurial education, teachers are facilitators and coaches, who guide the student rather than giving instructions. This may require teachers to change some of their professional knowledge base. A real change in teaching will be only subsequent to an observed positive change in the students' learning outcome, which the teacher attributes to a changed educational design. Continued professional training is thus a very important resource for entrepreneurial education. It should be taken into consideration that teacher change is highly individual and that tailored training might be needed to introduce a broad change in educational design.

Table 4 provides an overview of key issues, which emerged from the discussion in this chapter, suggestions of who could take a leading role amongst teachers and school management, and further readings and case studies.
<table>
<thead>
<tr>
<th>Key issues</th>
<th>School management</th>
<th>Teachers</th>
<th>Further readings</th>
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<tr>
<td>The school manager has created an atmosphere, in which teachers feel</td>
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<td></td>
<td>• Sagar (2015)</td>
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<td>confident to experiment and develop own projects.</td>
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<td>• Veljko Drobnjaković (Montenegro)</td>
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<td>• Internatsschule Schloss Hansenberg (Germany)</td>
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<td>• Alakylän Koulu (Finland)</td>
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<td>Sufficient and stable financial and human resources are available for</td>
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<td>• Sagar (2015)</td>
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<td>entrepreneurial education.</td>
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<td>There is flexibility to allow for extra time for pedagogical discussions</td>
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<td>dedicated to entrepreneurial education.</td>
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<td>Modern technology resources are used in education. The school supports</td>
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<td>teachers to use digital learning materials and open educational resources.</td>
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<td>Professional development and training are available for teachers who are</td>
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<td>interested in entrepreneurial education</td>
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<td>Good quality teaching and learning materials are available for entrepreneurial education.</td>
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<td>Collaboration for teachers across subject and education levels is</td>
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<td>facilitated to teacher peer learning.</td>
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<td>Team building of committed and skeptical teachers is facilitated.</td>
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<td>• Sagar (2015)</td>
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<td>• Veljko Drobnjaković (Montenegro)</td>
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<td>• San Jose de Calasanz Ikastetxea (Basque/Spain)</td>
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ENTREPRENEURIAL EDUCATION IN PRACTICE

Entrepreneurial education is student- and process- oriented, and assignments and assessments are designed in such a way that students are able to acquire, understand and reflect upon knowledge, which they can then apply in different contexts and situations. From an educational perspective there is general consensus with the recommendation of the Oslo Agenda to "embed elements of entrepreneurial behaviour (curiosity, creativity, autonomy, initiative, team spirit) already in primary school education". But, how can this be translated into daily education practice? Are teachers developing curricula that genuinely put the learner in the driver’s seat, enabling students to make mistakes and to learn from them, and encourage creativity, also through an understanding of the role of emotion in learning? Are school managers embracing and supporting the implied shift in the role of the teacher in applying new teaching methods and shaping contextualised learning environments?

As Penaluna and Penaluna (2015) pointed out, if students always have a set target with a clearly defined pathway through which to achieve it, they do not have the opportunity to respond in a flexible and adaptable way, because the situation has not demanded such behaviour. Instead, the entrepreneurial student is a "reasonable adventurer", who is able to demonstrate the ability to act on the information at hand, and to articulate the reasoning behind his/her actions, irrespective of success or failure. This is closely linked to the notion of creative thinking. Knowledge retention is based on what the student already knows through prior work or experience and, importantly, what they can call to mind when needed. For this to happen, the student has engaged with prior learning and found it useful enough to retain – usually through some kind of emotional engagement (Blakemore and Frith, 2005).

Fun, relevance and, above all, creative role-playing, as Penaluna and Penaluna (2015) argued, enhance creative thinking and allows students to be quick and efficient "knowledge harvesters", not only in order to respond to fast changing environments, but also in order to take on board new facts and factors that had not previously been considered. It takes approximately ten years, as Simonton (1999) estimated, to learn the ideas and skills that one needs to think of creative ideas. Hence, infrequent brainstorming, and similar "creativity exercises" may be misdirected approaches that do not take into account that frequency and progressive continuity are as important as the exercise itself. Entrepreneurial education has thus more in common with the continuous and developmental coaching of an athlete than a periodic attempt to practice something. Whereas it is well accepted that any formula or routine may have to change due to evolving circumstances, it is often overlooked that also students may have to "unlearn" things that were previously valid, and that unlearning is often a prerequisite to seeing things in new ways (McWilliam, 2008). Similarly, also teachers and school managers may have to see things in new ways, and dare to discard thinking and behaviour that is no longer useful. See a detailed discussion of this in Penaluna and Penaluna (2015).

About, through and for entrepreneurship: learning by creating value

Promoting entrepreneurship through education is commonly understood as three interlinked approaches – "about", "through", and "for" entrepreneurship (See Lackéus (2015) for an introduction). Teaching "about" entrepreneurship implies a content-laden and theory-based approach about the entrepreneur and entrepreneurship. Instead, teaching "through" entrepreneurship is an experiential

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9 For a copy of the Oslo Agenda for Entrepreneurship Education in Europe, see http://ec.europa.eu/enterprise/policies/sme/files/support_measures/training_education/doc/oslo_agenda_final_en.pdf
process, which aims at building entrepreneurial competencies referring to the wider understanding of entrepreneurship and the sense of initiative. Narrowing these down to the actual behaviour of firm creation is the aim of teaching "for" entrepreneurship, which is an occupation-oriented approach that seeks to develop the knowledge and skills for entrepreneurship, that is, the attitudes, skills and knowledge to start or take over, run and grow a firm.

Figure 4. Overview of terms and definitions currently used in entrepreneurial education

As it was mentioned earlier in this paper, there is a striking similarity between entrepreneurial education and authentic learning (See Sagar (2015), for an overview of authentic learning). Common is the understanding that intrinsic motivation drives the learning process and enhances learning outcomes. Students are considered as self-directed learners and efforts are focused to encourage inquiry, exploration and reflection. Assignments and projects are interdisciplinary, often have close links with the surrounding world, and are curriculum-based but flexible enough to resemble real-life situations. They are meaningful, purposeful and have personal relevance to the student.

The variety of concepts and teaching practices which are associated with entrepreneurial education can, however, be confusing for teachers and may cause or add to existing scepticism. When a new teaching practice is presented to teachers, they may not perceive it as entirely new but as a "popular trend" or something that needs a new name in order to be added to an already crowded curriculum. To avoid such reactions, it is, therefore, important to meaningfully distinguish entrepreneurial education from other concepts.

Following a growing trend in research (e.g., Lackéus 2015) and practice (e.g., Danish Foundation for Entrepreneurship), we suggest to focus on the purpose of entrepreneurial learning, which is "learning-by-creating-value". Students perceive assignments and the knowledge and skills generated
through them as creating value in personal, social, ecological, cultural or economic contexts. Value can be associated to one-self and/or to others. Whereas creating "value-to-others" applies readily to secondary, vocational education and training and higher education, it may be cumbersome for teachers in earlier levels of education to create such assignments on a regular basis. Here, the focus is on making the students feel "value-to-themselves", which has a positive impact on the student’s inner drive and h/er motivation to learn. See Lackéus (2015) for a detailed discussion.

Narratives are an often used and effective means to build entrepreneurial role models and to explain what creating "value-to-others" means in real-life. Interestingly, success and morality are two recurring themes (Smith, 2002; Vaidya, 2014). Komulainen et al. (2013) analysed 219 narratives of 15-16 year-old students of Finish comprehensive schools, who participated in the annual writing competition "Good Enterprise!", and explored the types of representations of space, place and possible self, which students produced in their narratives. Common were representations of entrepreneurship as a familiar, domestic, rural and local activity rather than narratives of the global self. Students prefer "next-door examples", to which they can connect through personal networks and not the "icon entrepreneurs", as shown on mass media (Bosma et al., 2012).

Research on how real-life entrepreneurs learn is still largely disconnected from the educational domain and thus offers, as Lackéus (2015) pointed out, little advice for teachers. However, since the commonly presented argument, also backed by empirical evidence, is that learning through own experience is crucial entrepreneurship-specific education activities (as well as for entrepreneurial education in general), Lackéus advice for teachers is to give students assignments to create value (preferably innovative) to external stakeholders. In this, the students themselves identify the underlying problems and take full responsibility for how they approach the assignment. This will lead to repeated interactions with the outside world, which may also trigger uncertainty, ambiguity and confusion. Nevertheless, this can be a salient source of deep learning, if the levels of difficulty and uncertainty, resulting from the exposure to external actors and their expectations, are encountered by team work, peer learning, assertive feedback, and a protected framework, which allows students to learn from eventual failures and mistakes. As we argued earlier in this paper, it needs time and continuity, preferably months or years, to build this kind of relationships with external stakeholders.

**Conventional versus entrepreneurial teaching approaches**

Also Gibb and Cotton (1998) emphasised that students should "feel" and experience entrepreneurship in their learning environment rather than just learn about in a conventional manner. Table 5 provides a dichotomous overview of different approaches to education. This is not to say that alternative teaching approaches, in this case entrepreneurial education, are the most effective approaches in all circumstances. The different task descriptions, listed below, help teachers to make an informed decision about which approach to choose in which situation.

<table>
<thead>
<tr>
<th>CONTENT-ORIENTED</th>
<th>PROCESS-ORIENTED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Know &quot;what&quot;</strong></td>
<td><strong>Know &quot;how and who&quot;</strong></td>
</tr>
<tr>
<td>Tasks and examinations are designed for students to re-/produce de-contextualised content.</td>
<td>Tasks and examinations are designed in a way that students apply prior gained knowledge to various relevant contexts.</td>
</tr>
<tr>
<td>Tasks and examinations focus on answers, which explain/re-produce the concepts.</td>
<td>Tasks and examinations focus on answers which require the students to use the knowledge with understanding and in an appropriate manner.</td>
</tr>
</tbody>
</table>

28
relevance of the knowledge and to whom it is relevant is an important aspect of the tasks.

Practical relevance of theory
Problem/multi-disciplinary focus
- The students are exposed to real-life context, which is multidisciplinary, in which various theoretical concepts can be used.

Learn from mistakes
- The learning and assessment activities include student debates in which students have to take standpoints based on the concepts which they are studying. The examination is to actually write a debate article which is to be submitted for publication in a local newspaper. As in real life, there are several ways in which to write an article of high quality. The article may include several different perspectives on the issue and relates to the content to be learned.

TEACHER-ORIENTED

Teacher is the expert
- The teachers instructs in a direct manner guided by h/er lesson plan.

Teacher is infallible (one-sided learning)
- The teacher presents facts and know-how and does so in a ‘right-or-wrong’ manner.

Passive student (receiving knowledge)
- The teacher presents knowledge and know-how to what he/she perceives as passive learners.

Imposed learning objectives
- The teacher decides the knowledge and skills which constitute the learning, justified by h/er interpretation of the curriculum and national tests.

Emotional detachment
- The content and methods for learning leave students emotionally detached.

Limited exchange
- The teacher has rigid lesson plans and focuses on executing them on time.

Programmed sessions
- The teacher sticks to h/er lesson plans, which are constructed in alignment with the content of school text books and national tests.

STUDENT-ORIENTED

Teacher is the facilitator
- The teacher allows for and encourages student-directed learning, based on their curiosity and on what is relevant and valuable to them.

Teacher learns (two-sided learning)
- The teacher encourages the student to find facts from a variety of sources, to reflect on how to use it and also provides support and appropriate challenge in the student’s process of learning the new knowledge and skills. The teacher is open to the students’ novel solutions and recognises h/er own learning from this.

Active student (generating knowledge)
- The teacher expects the students to have to work with the new knowledge for deep-learning and concept change to occur. The teacher tries to find out about each individual student’s ‘alternative’ conceptions.

Negotiated learning objectives
- To some extent, the teacher engages the students in defining the learning objectives (what) and how, when, where and with whom this is to be learned. The discussion is focused on the creation of value for the student in the learning process.

Emotional involvement
- The content and methods for learning are such that the students easily can relate to them and the students get emotionally involved in solving the task.

Interactive learning
- The teacher has a flexible lesson plan which allows h/er to be guided by the students’ curiosity, motivation and needs, also on individual levels. The focus is on deep-learning rather making sure that there is time to go through everything in the plan.

Flexible sessions
- The teacher proposes lesson plans, on which the students’ interest, needs, suggestions and ‘alternative’ conceptions have influence. The teacher makes use of regular formative assessment to guide his/her lesson plans. The teacher recognize the students as resources
in their own and their class-mates' learning. The students may work with different assignments and in different ways to reach the learning objectives.


**Understanding how emotion impacts on learning and performance**

Emotion plays a key role in entrepreneurial learning. Penaluna and Penaluna (2015) provided useful advice to teachers how to manage learning processes. Learners working on team projects, where they are evaluated for their individual contributions, for example, through personal auditing of team member contributions or group contributions to bigger picture scenarios (or a combination of the two) can act as both trust building experiences and reflective learning through personal monitoring. This needs to take place in an environment where learners are encouraged to both challenge and be challenged on their ideas, ideally through concepts akin to prototyping – where the process of learning is considered as important as the final outcomes.

This is also relevant for entrepreneurship-specific education activities. Today, the majority of new ventures are created in teams (Klotz et al., 2014). This requires teachers and school management to develop opportunities that engender knowledge and behaviours associated with team work, conflict resolution, flexibility, communication and leadership. Teams can also extend beyond student cohorts and involve externals. Practical experience of team working can be gained also from being responsible for the running of a shop or café in the school, being involved in or in charge of fund raising activities, working with local charities, and the organisation of an event.

Young learners, predominantly because of their lack of concern over failure, are more creative, whereas post-puberty students are more conservative in their thinking styles and unless creativity exercises are regular and enjoyable, their creative capacity will decline. As children get older, fear of failure can also demotivate learning in general (Ordonez et al., 2009). This is because our brain is inherently designed to resist change. If learning is not rewarded, for example by being told that something is wrong as opposed to being told that it "is a useful alternative that requires further consideration", the student is likely to stop an activity. If not used the neural networks that support creative thinking which embraces uncertainty and change simply die off.\(^{10}\)

Positive experiences and reward mechanisms can help to counteract this reaction. Providing constructive and forward-leading feedback that informs progress, takes into account multiple answers and solutions and responds to changing circumstances creates conducive learning environments. An example is Greenhill Primary, Sheffield, UK where feedback takes the form of "two stars and a wish". Students get two positive comments on what has been done well (two stars) and one comment on what can be improved (a wish). In this approach, the negative aspect of a "right or wrong" evaluation is turned around to be an overall positive evaluation for the students to learn from. See Penaluna and Penaluna (2015) for a detailed discussion.

To read more about how to organise this kind of learning activities and appropriate assessment strategies, and for brief introduction to various teaching approaches and pedagogies, such as effectuation, service learning and design thinking, see Lackeus (2015).

\(^{10}\) For a detailed discussion see Penaluna et al. (2010).
Assessment in entrepreneurial education

Basing the assessment of learning outcomes of entrepreneurial education solely on "norm referencing" that compares student performance within standardised tests, which are designed to facilitate comparison to standards or averages, and "criterion referencing"11 that compares student performance against specific requirements or criteria, can be major barriers to effective assessment as Penaluna and Penaluna (2015) pointed out. Instead "constructive alignment" (Biggs, 1996) is important here as we need to think more broadly and consider "fit for purpose" assessment as opposed to, for example, questions that merely revolve around what the learner can remember. Assessment of learning within entrepreneurial education needs to rely on context, alignment to the learning tasks, harvesting expertise, self-direction and relevance in the eyes of the learners.

Penaluna and Penaluna (2015) argued for the need to distinguish assessing something known, for which reference values exist from assessing something novel and unknown. A new idea or new initiative, which was generated in or emerged from complex or confusing environments, will be unpredictable, and thus very likely juxtapose the view that all learning should be measured by "known knowns", that is, through a series of learning outcomes that predict student performance. Instead, learning outcomes associated with innovative ideas and initiatives need to take into account the contemporaneous or sequential generation of alternative ideas and the ability to see multiple solutions, in addition to the ability to acquire and reproduce knowledge that is measurable against accepted norms and knowns.

Consequently, they propose a distinction between learning for "Innovation" and learning for "Implementation" to define and assess dissimilar learning outcomes. Implementation" (of predictable outcomes) and "Innovation" (of the process of being innovative) relate to two different thinking styles: that of divergent thinking – where the thinker is encouraged to think broadly and widely, and that of convergent thinking – where the thinker is more concerned about eliminating aspects that are unhelpful and focuses deeply on management of existing knowledge. Table 6 below offers insights into the alternative methods of evaluating student performance.

Table 6. Implementation versus innovation assessment issues

<table>
<thead>
<tr>
<th>Implementation – assessment types</th>
<th>Innovation – assessment types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can the student write and follow a business plan?</td>
<td>Can the student respond positively to short term and ever changing venture environments</td>
</tr>
<tr>
<td>Can the student come up with a good idea?</td>
<td>Can the student come up with multiple ideas that respond to changing circumstances?</td>
</tr>
<tr>
<td>Does the student's solution match the expectation of the test or exam?</td>
<td>Does the student's solution surprise through new insights and alternatives?</td>
</tr>
<tr>
<td>Does the student respond to the problem identified by the educator?</td>
<td>Does the student identify new problems and opportunities for themselves?</td>
</tr>
<tr>
<td>Is the solution correct, finite and complete in the view of the educator / evaluator?</td>
<td>Is the solution part of an ongoing process of prototyping that responds to stakeholder feedback?</td>
</tr>
<tr>
<td>Can the solution be easily compared and contrasted to previous work and understandings?</td>
<td>Does the solution offer new insights and potentially challenge accepted understandings?</td>
</tr>
<tr>
<td>Can the student adhere to the use of accepted theories and practices when undertaking an assignment?</td>
<td>Can the student experiment and self-define a range of theories that support or argue against their findings?</td>
</tr>
</tbody>
</table>

11 The glossary of education reform makes useful distinctions between norm and criterion referencing here: 
<table>
<thead>
<tr>
<th>Question</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the student follow the rules carefully when developing a solution?</td>
<td>Does the student compare their solutions to rules and adapt accordingly?</td>
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<tr>
<td>Does the solution require significant resource?</td>
<td>Is the solution testable in a lean environment, and is it potentially scalable?</td>
</tr>
<tr>
<td>Does the assessment look to past understandings?</td>
<td>Does the assessment look to support new understandings?</td>
</tr>
<tr>
<td>Does the assessment look to past contexts?</td>
<td>Does the assessment consider future and unknown contexts?</td>
</tr>
<tr>
<td>Does the leadership style in the task (teamwork) require decision-making by the principal?</td>
<td>Does the leadership style in the task (teamwork) require the management of an inclusive decision making process?</td>
</tr>
</tbody>
</table>


A simple question can assist the teacher: Is the assessment based on consistent criteria that are well defined and stable (i.e., implementation of the known), or does the assessment look to evaluate performance within uncertain environments (i.e., innovation)? For example, the task for the student could be to assist the hard of hearing and come up with a few contextual links such as hearing aids and written instruction, things that are already common place and hence not very innovative. Another student might block up their ears for a day and come to realise through direct experience that enhanced visual skills are needed, or that other senses such as smell become more pronounced.

Through thinking further and wider, the student exhibits a greater innovation capacity and when it comes to the divergent stage of thinking, will have many more ideas and thoughts to eliminate or consider. This type of thinking develops skills to see things in new ways, in order to develop new products, services or even new and unresolved problems for a business. Once this is undertaken and the learner’s mind is full of opportunities, without great concern for perfection or exactness, then the convergent style of thinking is required. Here the full range of ideas can be evaluated against, for example, situations, rules, social norms, ethical considerations etc., etc. It is important to note that the more divergent the ideas, the more opportunity there is for more novel solutions to assess and evaluate.

As Penaluna and Penaluna pointed out, there is a dominant tendency to focus on getting an idea quickly through a short brainstorming session or two, then focussing deeply on the convergent type of analytical thinking that tests the ideas, and report on them for assessment purposes. In this way lots of good ideas might get lost, as– to paraphrase the late Steve Jobs, co-founder and CEO of Apple – the students start to join up the dots before they have seen all the dots that are available. In entrepreneurship-centred education activities, business plans are often central elements of assessment strategies although it is widely accepted they are not best suited to break down the cycle of thinking that turns innovation into processes and products.

**Summary of key issues, further readings and examples**

Entrepreneurial education is student- and process- oriented, and assignments and assessments should be designed in such a way that students are able to acquire, understand and reflect upon knowledge, which they can then apply to different situations and contexts. At the same time, sufficient space is needed in the curriculum to accommodate the two overarching and co-existing learning objectives, which are "being entrepreneurial" and "becoming an entrepreneur". Closely linked to the notion of creative thinking, students will become able to demonstrate the ability to act on the information at hand, and to articulate the reasoning behind their actions, irrespective of success or failure. This also applies to entrepreneurship-specific education activities.
Basing learning outcomes assessment of entrepreneurial education solely on norm and criterion referencing is likely to miss out important learning outcomes, such as non-cognitive skills and divergent thinking. Learning outcomes associated with innovative ideas and the novel/unknown need to take into account the contemporaneous or sequential generation of alternative ideas and the student's ability to take into account multiple solutions, in addition to the ability to acquire and reproduce knowledge that is measurable against accepted norms and knowns.

Table 7 provides an overview of key issues, which emerged from the discussion in this chapter, suggestions of who could take a leading role amongst teachers and school management, and further readings and case studies.

Table 7. Entrepreneurial education in practice: issues, readings, examples

<table>
<thead>
<tr>
<th>Key issues</th>
<th>Teachers</th>
<th>School management</th>
<th>Further readings</th>
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</thead>
<tbody>
<tr>
<td>The objective of entrepreneurial education is to develop the ability and willingness of learners to create value for themselves and others. This includes:</td>
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<tr>
<td>– Personal development, through non-cognitive and meta-cognitive skills.</td>
<td></td>
<td></td>
<td>• Lackéus (2015)</td>
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<td></td>
<td></td>
<td></td>
<td>• Sagar (2015)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Krueger (2015)</td>
</tr>
<tr>
<td>– Building an awareness of the importance of entrepreneurship (either for the purpose of profit or not) and the role of entrepreneur in society.</td>
<td></td>
<td></td>
<td>• Alakylän Koulu (Finland)</td>
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<td></td>
<td></td>
<td></td>
<td>• Drivkraft Söderhamn (Sweden)</td>
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<td></td>
<td></td>
<td></td>
<td>• Lackéus (2015)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Penaluna &amp; Penaluna (2015)</td>
</tr>
<tr>
<td>– Building the knowledge and skills to start or take over, run and grow a firm.</td>
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<td></td>
<td>• Anatolia College IBDP (Greece)</td>
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<td></td>
<td></td>
<td></td>
<td>• Koninklijk Technisch Ateneum (Netherlands)</td>
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<td></td>
<td>• Academy of Lilles (France)</td>
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<td></td>
<td></td>
<td></td>
<td>• VET school Murau (Austria)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Transport Academy (Slovak Republic)</td>
</tr>
<tr>
<td>Core elements of entrepreneurial education are:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Experiential learning and learning in context</td>
<td></td>
<td></td>
<td>• Lackéus (2015)</td>
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<td></td>
<td></td>
<td></td>
<td>• Sagar (2015)</td>
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<td></td>
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<td></td>
<td>• Penaluna &amp; Penaluna (2015)</td>
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<td>• Krueger (2015)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Toutain &amp; Mueller (2015)</td>
</tr>
<tr>
<td>– Collaborative work and open-ended project assignments</td>
<td></td>
<td></td>
<td>• Alakylän Koulu (Finland)</td>
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<td></td>
<td></td>
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<td>• Academy of</td>
</tr>
</tbody>
</table>
– Authentic or similar to authentic assignments

– Autonomous learning outside classroom (e.g. in leisure time, during internships)

– Learners are encouraged to see failure as constructive learning experience

Learning outcomes of entrepreneurship education are regularly assessed. Assessment takes in consideration collective, social and emotional aspects of the learning process.

Learner:

– Are involved in the establishment of learning objectives, teaching and the assessment of learning outcomes

– Have the possibility to engage in long-term projects that can run over several academic years

– Are encouraged and supported to take action in addressing societal challenges based on their own interests, values and ideas

– Have a central role in "learning-by-creating-value" (identification of needs, process and project implementation)

Ideas generation activities are organised to assist learners in making productive and innovative use of what


Lilles (France) • Lenné Gesamtschule Potsdam (Germany)

• Lackéus (2015) • Sagar (2015)

• Evangelisches Ratsgymnasium (Germany)

• Penaluna & Penaluna (2015)

• VET school Murau (Austria)

• Lackéus (2015) • Sagar (2015)

• Landesgymnasium für Hochbegabte Schwäbisch Gmünd

• Penaluna & Penaluna (2015)

• Anatolia College IBDP (Greece)

• Lackéus (2015) • Sagar (2015)

• Evangelisches Ratsgymnasium (Germany)

• Penaluna & Penaluna (2015)

• Highfurlong (UK/England)

• Krueger (2015)

• Alakylän Koulu (Finland)

• Lackéus (2015) • Sagar (2015)

• Highfurlong (UK/England)

• Penaluna & Penaluna (2015)

• Evangelisches Ratsgymnasium (Germany)

• Krueger (2015)

• Anatolia College IBDP (Greece)

• Veljko Drobnjaković (Montenegro)

• Lackéus (2015) • Sagar (2015)

• Anatolia College IBDP (Greece)

• Penaluna & Penaluna (2015)

• Veljko Drobnjaković (Montenegro)

• Lackéus (2015) • Sagar (2015)

• Veljko Drobnjaković (Montenegro)

The local economy offers.

The school supports the creation of firms either directly or through referral to specialised organisations.

There is a school club or network that brings together learners who are interested in starting a firm and entrepreneurs.

The school actively involves local entrepreneurs and/or entrepreneur-alumni as role models for learners.

- Penaluna & Penaluna (2015)
- Lackéus (2015)

- Penaluna & Penaluna (2015)
- Lackéus (2015)

- Penaluna & Penaluna (2015)
- Lackéus (2015)
- Sagar (2015)

- Transport Academy (Slovak Republic)
- San Jose de Calasanz Ikastetxea (Basque/Spain)
- Anatolia College IBDP (Greece)
- Internatschule Schloss Hansenberg (Germany)
- Lenné Gesamtschule Potsdam (Germany)
- Transport Academy (Slovak Republic)

CONCLUSIONS

Numerous activities are underway to build effective learning environments for entrepreneurial competencies in general, and skills for entrepreneurship in particular. In this guidance note, we have focused on the common success factors, such as a shared understanding of what entrepreneurship means for the school and its cultural and socio-economic context, student- and process-centred teaching, in which students are central actors of education – within a framework adapted to the students’ age and abilities, they are encouraged and supported to co-design, co-educate and co-assess education activities. We have focused on those factors that can be shaped by the school manager and/or the teacher, that is, educational design, learning environments, the role of the teacher, and the school's collaboration with its surrounding environment.

Promoting entrepreneurial competencies and skills for entrepreneurship through education requires sufficient space in the curriculum to accommodate the two overarching and co-existing learning objectives, which are "being entrepreneurial" and "becoming an entrepreneur". School managers and teachers play crucial roles in building learning environments that nurture these in an integral, transversal and progressive way across all aspects of education. To achieve this, systemic changes may be needed to delegate greater decision-making power to individual schools in the organisation of education, and to create incentives for effective local partnerships, which build on the resources, interests and activities of different actors.
REFERENCES


Eurydice (2012) Entrepreneurship Education at School in Europe: National Strategies, Curricular and Learning Outcomes available online at

36


**Case studies**

Alakylän Koulu (Finland), Entrepreneurship360 case study, http://www.oecd.org/site/entrepreneurship360/home/.

Anatolia College IBDP (Greece), Entrepreneurship360 case study, http://www.oecd.org/site/entrepreneurship360/home/.


Internatsschule Schloss Hansenberg (Germany), Entrepreneurship360 case study, http://www.oecd.org/site/entrepreneurship360/home/.


Landesgymnasium für Hochbegabte Schwäbisch Gmünd (Germany), Entrepreneurship360 case study, http://www.oecd.org/site/entrepreneurship360/home/.


Lenné Gesamtschule Potsdam (Germany), Entrepreneurship360 case study, http://www.oecd.org/site/entrepreneurship360/home/.

San Jose de Calasanz Ikastetxea (Spain), Entrepreneurship360 case study, http://www.oecd.org/site/entrepreneurship360/home/.


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