Tímarit um uppeldi og menntun / Icelandic Journal of Education | *25*(2), 2016, 183–196
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# Pedagogical entrepreneurship in teacher education – what and why?

This literature-based article is a contribution to the discussion of the concept pedagogical entrepreneurship in teacher education, what it is, and why it should be emphasised. This is done through a presentation of how the concept of entrepreneurship has been introduced to education, and challenges it has brought along. The case of school mathematics is used to examine ways in which pedagogical entrepreneurship can be developed and operationalized. The necessity for student teachers to learn through entrepreneurship is put forward as an important measure to achieve authenticity and for schools to pay attention to students' action competence and to develop their ability to self-regulate.

Keywords: pedagogical entrepreneurship, teacher education, problem solving, action competence

## INTRODUCTION

Historically, entrepreneurship is clearly anchored in economics, for which stimulation of economic growth and employment is an important goal. Over recent decades, entrepreneurship has been linked more closely to the education sector; for instance, it has been a central element of the EU since 2000, when the Lisbon Strategy was promulgated by the European Council. The arguments in the Lisbon Strategy were clearly based on socioeconomics:

> Unless Europe is prepared to invest in enterprise education at all ages, involve the private sector as a full partner in the learning process, and inspire its young people to think outside the box, Lisbon's vision of sustainable growth and more jobs will not be achieved. (European Council, 2000)

According to the EU, the purpose of entrepreneurship in education is to qualify and motivate students to achieve "economic growth" and "more jobs". In contrast, entrepreneurship in education is often referred to as *pedagogical entrepreneurship*, which distinguishes it from the traditional core economic and business aspects of entrepreneurship concepts. Pedagogical entrepreneurship can be understood as a composite of

two subject areas, each with its own traditions and mindset: on the one hand, pedagogy with its long scientific tradition of focusing on upbringing, socialization, knowledge, motivation, learning, and formation, and on the other, entrepreneurship, which has its roots in an economic tradition focusing on business development, individual initiative and risk-taking.

The economic aspect (The *E* in pedagogical entrepreneurship) has faced some resistance from teachers through its emphasis on economic wealth (Backström-Widjeskog, 2008; Komulainen, Naskali, Korhonen, & Keskitalo-Foley, 2011; Leffler, 2009; Røe Ødegård, 2014) and has been looked upon as a topic that has traditionally not been schools' responsibility to support or underpin. However, if the entrepreneurship component of pedagogical entrepreneurship is lacking or inadequate, only the pedagogy remains.

In recent decades, extensive political attention has been devoted to entrepreneurship in compulsory schooling at both national and international levels (European Commission, 2010, 2011, 2013; Lund, Lindfors, Dal, & Sjøvoll, 2011; OECD, 2009, 2010). This, in turn, affects teacher education. The issues of compulsory school affect the education of teachers, whose academic environment is supposed to meet the expectation that entrepreneurship will be included in the teaching of subjects and themes in teacher education. Student teachers are potentially important future change agents for school development (Borasi & Finnegan, 2010). This is the background for the question that we raise in this article: What is pedagogical entrepreneurship, and why should it be emphasised in teacher education? Our inquiry is twofold: First we explain what pedagogical entrepreneurship is, why it is a challenging concept, and how one has chosen to approach the concept in a pedagogical context. Secondly we apply a case from Norwegian teacher education to show an example of how an entrepreneurial approach can be emphasised in school mathematics.

## PEDAGOGICAL ENTREPRENEURSHIP

Early research on entrepreneurship sprang from the economic tradition, and the economist Joseph A. Schumpeter deserves a great deal of honour for the prevalence of the concept (Røe Ødegård, 2015). He emphasised that entrepreneurs were people who were especially able to take advantage of adversity or bad times by forging ahead with innovations. They dared to invest in new technology and knowledge, recognizing new products, production methods, distribution and marketing before others did. For entrepreneurs, economy and innovation work hand in hand. This duality is still attached to the concept of entrepreneurship in education. This is evident in the Lisbon Strategy (European Council, 2000), which encourages children and youngsters to think outside the box as a quality for economic growth and employment. Last but not least, the notion is to be found in the description given by the European Commission:

Entrepreneurship in education includes two elements: The specific concept of training people to create a business and "a broader concept of education for entrepreneurial attitudes and skills, which involves developing certain personal qualities and [which] is not directly focused on the creation of new businesses" (European Commission, 2004,

p. 11). This duality between a business training concept and a broader concept has contributed to the growth of various approaches to entrepreneurship. When entrepreneurship is attached to several disciplines, and when the concept is used with various prefixes, as it is in terms such as social entrepreneurship, cultural entrepreneurship, ecological entrepreneurship, indigenous entrepreneurship, and women's entrepreneurship, it has proved difficult to reach a clear and unambiguous definition of the concept. Initially, this seems somewhat baffling. What is the difference between the above-mentioned kinds of entrepreneurship, and "regular" entrepreneurship? In attempts to attach entrepreneurship to a discipline, there has arisen a tendency for researchers and professionals to ascribe to the entrepreneurial field concepts that best suit their disciplinary affiliation. Therefore, in attempts to find common definitions, it is easy to become bewildered, as Alex Stewart (1991) states after a review of a broad selection of literature. He concludes by expressing the manifold nature of these definitions by referring to the term as "a conceptual tower of Babel" (Stewart, 1991, p. 73).

## A challenging concept

A literature review on research on pedagogical entrepreneurship (Haara, Jenssen, Fossøy, & Røe Ødegård, 2016), concluded that entrepreneurship researchers themselves find the concept challenging to define, although several attempts have been made (e.g., Erkillä, 2000; Røe Ødegård, 2003). On the one hand, the concept seems vague (Cardow & Kirkley, 2011; Seikkula-Leino, Satuvuori, Ruskovaara, & Hannula, 2015). On the other, some researchers describe how entrepreneurship is recognized (e.g., Fagan, 2006; Garnett, 2013; Huber, Sloof, & Van Praag, 2014), and the ways in which the concept is understood and treated in compulsory school and in teacher education. Furthermore, research points to a divergence between the concepts of entrepreneurship and enterprise (e.g., Fagan, 2006; Garnett, 2013; Seikkula-Leino, 2011), whereby entrepreneurship involves the acquisition of the specific skills needed to start and develop a small business. The concept of enterprise concerns the personal skills, behaviours and attributes that characterize entrepreneurs.

A corresponding divergence is identified in the concepts of internal and external entrepreneurship (e.g., Backström-Widjeskog, 2008; Komulainen et al., 2011; Korhonen, Komulainen, & Räty, 2012; Leffler, 2006). External entrepreneurship is promoted as the knowledge and skills required for establishing businesses, while internal entrepreneurship is recognized through personal features and attitudes, and in the value of entrepreneurial methods and learning strategies. These researchers distinguish between the two concepts by emphasising that internal entrepreneurship is a precondition for external entrepreneurship success. In addition, Huber et al. (2014) emphasise three concepts: non-cognitive entrepreneurial skills, entrepreneurship knowledge, and intention to become an entrepreneur. Their study measured what they defined as nine non-cognitive entrepreneurial skills: risk-taking, creativity, need for achievement, self-efficacy, social orientation, proactivity, persistence, ability to analyse, and motivation. These skills coincide quite closely with the personal features that comprise the concept of pedagogical

entrepreneurship described by other researchers (e.g., do Paço & Palinhas, 2011; Leffler, 2009; Mahieu, 2006; Røe Ødegård, 2012; Sjøvoll & Pedersen, 2014).

As noted, the traditional view of entrepreneurship is often dominated by the economic perspective. This has given entrepreneurship a bumpy journey in education and school contexts. When the economic perspective overwhelms all other perspectives, it becomes more difficult to have a reasonable and valuable dialogue about the role of entrepreneurship in school and teacher education. The dominance of the economic perspective may lead to scepticism in these environments because their goals and assessments are not aimed explicitly at economic issues (Backström-Widjeskog, 2008; Komulainen et al., 2011; Leffler, 2009; Røe Ødegård, 2014). On the other hand, one should not be surprised by the persistence of the economic perspective, because it connects with organizations such as EU and OECD's recognition of education as central to economic and social policy development.

The vagueness and bewilderment regarding the concept is not the only cause of tension associated with pedagogical entrepreneurship. Haara et al. (2016) identified several causes of strain between the politically prescribed definition of pedagogical entrepreneurship and the common impression of what the term represents. They observed a lack of congruence between the intentions signalled by policymakers and implementation by educators in schools, as well as insufficient knowledge about entrepreneurship among teachers. The conceptual uncertainty surrounding pedagogical entrepreneurship makes the implementation of entrepreneurship education in teaching challenging because teachers are not sure what they are supposed to do, why they should do it, and how it can be implemented or recognized in their teaching.

## A pedagogical approach

International (European Commission, 2013; OECD, 2009) and national policy documents (e.g., KD, KRD, & NHD, 2006, 2009; Skolverket, 2015) have argued that entrepreneurship should be interpreted as a pedagogical approach, not as a topic that primarily offers specific knowledge about starting up and running a business. According to Haara et al. (2016), the research environment of pedagogical entrepreneurship supports this perspective and relates personal features and skills to the concept. It may be asked what separates these features and skills from those that schools have traditionally been expected to develop and enhance. It might be claimed that they are similar to features and skills that schools for some time have attempted to develop by emphasising, for example, problem solving, problem-based learning and Storyline.

More than ten years ago, Røe Ødegård (2003) attempted to define pedagogical entrepreneurship as action-oriented teaching and learning in a social context where the learner is active in his/her own learning, and where personal features, abilities, knowledge and skills provide the foundation and direction for the learning processes. Such features point to the development of inner qualities such as ability to analyse, flexibility, dynamism, creativity, cooperativeness and proactivity. In fact, these are features that to a considerable extent are recognized from self-regulated learning. Self-regulation implies

flexible goal-setting, planning, monitoring of progress and the ability to adapt learning strategies to task demands (Borkowski, Chan, & Muthukrishna, 2000; Schraw, 2001).

According to Barry J. Zimmerman (2000) self-regulation can be divided into three cyclic phases: 1) Forethought – influential processes that precede efforts to act and set the stage for action, 2) Performance or volitional control – processes that occur during motoric efforts, affecting attention and action, and 3) Self-reflection – processes that occur after performance efforts, influencing a person's responses to the experience. From a social-cognitive perspective, self-regulated learning occurs through an interactive process between individuals and the environment they are in. According to Zimmerman (2000) such social modelling is emphasised in four stages: 1) Observing competent models, 2) Emulation – mimicking observed skills, 3) Self-control of skills – practical testing of new skills during structured situations, 4) Self-regulation – the individual is able to adapt the skills to changing situations in a systematic and pragmatic way.

In addition, among these features, entrepreneurship emphasises action competence. Action competence is the ability to critically make value judgments about different alternative ways to act for a sustainable future, and includes knowledge about different action possibilities, skills to investigate and discuss the different action possibilities and confidence to perform the actions (Hedefalk, Almqvist, & Lidar, 2014). Perhaps to a greater extent than other learning strategies or methods, it emphasises the subsequent application of acquired knowledge and reinforces its relevance to the student's life and to the community. The distinctiveness of entrepreneurship mirrors the actual creation of something new, and in this process learning and social interaction are core (Johannisson, 2005). The definition of entrepreneurship used in the Norwegian discourse on education and similar contexts is that it concerns activity and social interaction in a broad sense (KD, KRD, & NHD, 2006, 2009). Its focus is primarily on the development of creativity, initiative, independence and practical reasoning, in co-operation with others to promote societal values beyond the economic ones.

Therefore, when the concept of pedagogical entrepreneurship is introduced in relation to a lifelong learning perspective, it needs to be understood as forming a lifecycle in which the creative and active aspects of learning are core. The students need to learn to accept the consequences of their choices, maintain their pace and stamina when faced with tasks and problems to solve, co-operate with others, and take responsibility for themselves and their community (European Commission, 2013; KD et al., 2006, 2009; Lund et al., 2011). On this basis, the school system is expected to contribute to development and qualifications that encourage students to use these resources in a productive and meaningful manner.

## PEDAGOGICAL ENTREPRENEURSHIP IN TEACHER EDUCATION – EXEMPLIFIED IN THE NORWEGIAN CONTEXT

In Norway, entrepreneurship was mentioned as one of the main learning strategies within higher education as early as 1995 (FTD, 1995) and, in Norwegian teacher education, this perspective was prolonged in relation to reforms to improve the quality of teacher

education (UFD, 2002). According to the European Commission (2002), Norway and other countries began, rather feebly, to incorporate entrepreneurship into their teacher education programmes. Once again, the global perspective on the need for change in education in response to societal changes and future prospects was emphasised, this time at the national level (European Commission, 2002). Based on this reminder from the European Commission, a new curriculum for Norwegian teacher education was released in 2003; a curriculum that focused on teacher competence in relation to change, and development became the basis upon which to revive pedagogical work. Teachers' ability to think about learning in a proactive manner was to be stimulated.

> The teachers must, individually and in teams, be able to analyse and evaluate plans for activity, plans for subjects, and organization of education. They must be able to see the students' development, learning and formation in relation to societal changes. This entails creativity and learning strategies that promote entrepreneurship … (UFD, 2003, p. 5–6)

After this initial phase, emphasis on pedagogical entrepreneurship has been progressively strengthened in Norwegian teacher education. In 2006, a strategic plan for entrepreneurship in teacher education was released, calling for courses or projects to introduce students to entrepreneurship (KD et al., 2006). In 2010, this was followed by the reform of the Norwegian teacher education (KD, 2009). The reform strengthened the emphasis on student teachers' development of knowledge and skills in co-operation with those in the local environment to make students' education more practical and relevant (KD, 2009). Hence, the providers of teacher education in Norway were encouraged to help student teachers develop action competence that would make them more capable of analysing, planning, organizing and teaching in accordance with future school curricula, while emphasising that they did not yet know what would be required (Engelsen, 2009). Furthermore, the curriculum for Norwegian teacher education for compulsory school teachers calls for attention to pedagogical entrepreneurship, both in the formulation of competence objectives and as a learning strategy in the subjects taught by higher education institutions that offer teacher education (KD, 2010). Those encouragements and expectations influence how instructors in teacher education programmes plan, organize and conduct their teaching, and require the student teachers to be prepared to analyse and question their own teaching.

Haara et al. (2016) refer to research on pedagogical entrepreneurship in teacher education which points to the necessity of exposing teacher education students to the entrepreneurship perspective, so that they can interpret, experiment with and reflect on such an approach to teaching and learning. This perspective is supported by research on the future necessity of looking at teachers as change agents rather than as defenders of tradition in their practices, innovations, and eagerness to learn (Borasi & Finnegan, 2010; Van der Heijden, Geldens, Beijaard, & Popeijus, 2015). Such a perspective will make the student teachers and teachers in compulsory schools who follow in-service courses on pedagogical entrepreneurship effective agents of change who will prioritize pedagogical entrepreneurship at compulsory level. This will require emphasis on action competence, problem solving and self-regulation, which are universal skills and part of pedagogical entrepreneurial thought and action. It will also entail an emphasis on pedagogical entrepreneurship both across the school curriculum and in specific school subjects.

According to Haara et al. (2016), teacher education programmes need to include, or even model, pedagogical entrepreneurship at both theoretical and practical levels in order to achieve this. They recommend that practical activities should operationalize entrepreneurial approaches in both teacher education and in students' experiences of such approaches in their practice periods in compulsory schooling. Relevant questions then concern what such a development in school would provide, and whether a pedagogical entrepreneurship approach is actually required to achieve this.

## Pedagogical entrepreneurship and problem solving

The Norwegian framework for teacher education emphasises the development of learning strategies to stimulate the pedagogical use of entrepreneurship in education. However, entrepreneurship is not recognized as a separate, mandatory subject in teacher education programmes, and its inclusion in teacher education varies widely throughout the country. A recent study reported that in most programmes, entrepreneurship is offered in the form of in-service courses and not as an integrated part of teacher education (Bjørnåli, Støren, & Henaug, 2011). To grant the entrepreneurship concept an accepted position in teacher education programmes, it is necessary, first of all, to operationalize the concept.

Problem solving is an important part of mathematics (e.g., KD, 2006; Mason & Davis, 1991; Schoenfeld, 1993) and is an area that can instantly be associated with certain elements of pedagogical entrepreneurship, through shared concepts such as analysis, creativity, planning, risk, co-operation and reflection. In mathematics, a problem is understood as a challenge when there is no immediately obvious strategy or method available for its solution. In 1945, the Hungarian mathematician George Pólya described four phases of mathematical problem solving (Pólya, 1990). This description has become a reference point for the theory of problem solving in mathematics. The different phases are described as follows.

1. Understand the problem (What is the unknown? What are the conditions? What kind of information do you have?)
2. Make a plan (Have you seen the problem before? Can you solve the entire problem, or parts of it? Develop a strategy for solving the problem.)
3. Carry out the plan you have made (Control the execution of the steps you go through in this process and ensure that you follow your plan.)
4. Look back and learn from what you have done (Can you check the result? Can you generalize it? Can you now see the solution right away?)

Including problem solving in mathematics teaching presents challenges (Schoenfeld, 1993). The typical challenges are that the teacher must make many quick decisions and that the students should suggest different solutions without the teacher revealing the mathematical reasoning to be used. In addition, the teacher may find it necessary to help impatient students by reducing the problem to an exercise. Research also shows that problem solving may rapidly end up as amusing moments detached from other activities in the mathematics classroom (Klette, Grøver Aukrust, Hagtvet, & Hertzberg, 2003).

Hence, to solve problems in a meaningful way, the students must be given the opportunity and time to think both creatively and systematically, and to apply reason to conceptual mathematical qualities. The teaching must strike a balance between using students' reasoning as a starting point and clarifying basic mathematical ideas (Smith & Stein, 2011). Practically, this implies a process that relates the problem to a familiar concept, and then developing new knowledge based on the solution reached. After the problem has been solved, students review what was done so they can solve similar problems in the same way in the future.

Through a small-scale research project (Haara & Jenssen, 2013), the characteristics of pedagogical entrepreneurship and mathematical problem solving, and the features that they may share, were examined and confirmed. The researchers first wanted to confirm that entrepreneurial principles are already included in the education of mathematics teachers and then to prepare for the operationalization of pedagogical entrepreneurship as a learning strategy in mathematics teaching that included the subject's terms. Finding and establishing connections between pedagogical entrepreneurship and problem solving will legitimize the inclusion of entrepreneurship in teacher education and help prevent mathematics teachers from feeling that currently accepted methods would be replaced by alternative methods and strategies without a valid reason. Research on pedagogical entrepreneurship emphasises problem-based learning and problem-solving approaches (e.g., Røe Ødegård, 2015) as we have already seen. Problem solving may then be a method to address many of the features that pedagogical entrepreneurship aims to develop in school mathematics.

## DISCUSSION

In this article we look into what pedagogical entrepreneurship is, and why it should be emphasised in teacher education. Research clearly shows the most commonly reported challenge to the implementation of pedagogical entrepreneurship in primary school, lower secondary school and teacher education. This relates to teachers' bewilderment about the concept of entrepreneurship (both internal and external), and reluctance to introduce an alternative educational approach that threatens teachers' established beliefs and teaching methods (Haara et al., 2016). Different understandings of what content pedagogical entrepreneurship ought to have are also part of this discourse, for instance with regard to the question of including thoughtfulness and care for others in the development of students' self-regulation. Hence, there seems to be an ongoing struggle to define the concept in the entrepreneurial field. Pedagogical entrepreneurship should not be about supporting or opposing economy and business, but about paving the way for human development and growth through emphasis on authenticity, action competence and students' ability to self-regulate. Perhaps it hinders the development and operationalization of entrepreneurial methods and approaches, if all effort is devoted to discussions of the principles of the concept. The key consideration here concerns creating citizens who together are expected to build a good society in the future. If discussions of principles about the concept remain as the main concern – for instance, whether it is

a new or old concept, whether it is based on old ideas, or whether it contradicts school values – the research field will get nowhere.

However, there seems to be a general understanding about the core elements of the content of pedagogical entrepreneurship. A sustained emphasis on entrepreneurship in school is created by a high-quality learning environment, authenticity, and activity (Backström-Widjeskog, 2008), where mutual trust and respect between students and teachers prevails. Authenticity means that the activity is anchored in reality and provides options regarding real and relevant action (Ruskovaara & Pihkala, 2013; Seikkula-Leino et al., 2015). Activities are a means to develop entrepreneurial features and skills, and entail that students must be given the responsibility to seek and develop solutions themselves, and be encouraged towards this through tutoring and responses from the teacher and each other. However, an activity must not turn into an instrumental exercise, but should emphasise the students' intentions and reflections (Wallentin, Madsèn, & Johannisson, 2000). Therefore, the development of students' entrepreneurial qualities and skills is based on constructivist and sociocultural theories on learning, and knowledge development is reckoned to be a continuous construction and reconstruction process in which the student is an active participant (Røe Ødegård, 2015).

The Norwegian government aims to develop competence in pedagogical entrepreneurship by emphasising entrepreneurship in the education of teachers, through both teacher education programmes and in-service courses for teachers. Developing a positive attitude towards entrepreneurship among students requires teachers to understand the concepts of entrepreneurship (KD et al., 2009). In addition, research on pedagogical entrepreneurship, and more importantly, research on pedagogical entrepreneurship research (Haara et al., 2016), points to the necessity of emphasising pedagogical entrepreneurship in teacher education and in-service education for teachers. This emphasis is crucial for justifying the content of pedagogical entrepreneurship – why teachers should know how to teach in accordance with such a perspective, and how they can do so within and across school subjects.

## CONCLUSION

In this article, we have pointed out that pedagogical entrepreneurship has in many ways experienced a rather bumpy journey from political documents to practice in compulsory school and teacher education. This is because of ambiguity and bewilderment in the understanding of the concept, and because discussions in the field have to a large extent failed to move beyond the level of principles. The discussions have involved arguments for and against business-related aspects (external entrepreneurship), or whether pedagogical entrepreneurship brings along something new in addition to what is already known and established. In many ways, there has been a question of how far the *E* in *P*edagogical *E*ntrepreneurship can be reduced, without being left with a *P* that equals what is already known and established. Instead it needs to be emphasised that pedagogical entrepreneurship concerns students' active learning methods and learning strategies, self-regulated students, and action competence developed in authentic situations. Teachers of every

subject in every school may emphasise entrepreneurial content, through concentration on these issues. This means that in compulsory school students must be offered features, skills, knowledge and values necessary to become a citizen, both in a holistic manner and through their work on each school subject. In teacher education, it means that student teachers must be offered the opportunity to develop competence in paving the way for teaching and learning that stimulates such formation processes. This ought to be done not by learning about entrepreneurship, but *through* entrepreneurship, in order to achieve authenticity and for schools to pay attention to students' action competence and to develop their ability to self-regulate.

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The article was received 5th November 2015 and was accepted 7th September 2016

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