

# HOW DO INNOVATIVE STUDENTS FIT INTO EVIDENCE-BASED EDUCATION?

Birthe Lund  
Aalborg University  
Department of Learning and Philosophy  
Denmark

## Abstract

The state has been known as the major socio-political attribute of the Nordic model. Nordic pedagogic progressiveness has been internationally inspired which can be seen in the student centred learning tradition, the prevailing professional autonomy for educators and in democratic values as important parts of Nordic education.

This paper analyses the pedagogical implications of globalization, evidence based practice and the entrepreneurial discourse from a Nordic Didaktik perspective – a perspective of “Bildung”. It identifies how global actors as well as political discourses are striving to influence the conceptual understanding and application of innovation and creativity within education. The purpose of this paper is consequently to discuss the pedagogical implications of current aims towards the development of “innovative students” within two dominating and potentially contradicting global discourses:

The innovation discourse on the one hand, which stresses the importance of idea-creation, creativity, innovation, and the overall ability to bring something new into existence. And the evidence discourse on the other hand, stressing the importance of basic skill, competences and the measuring of learning outcomes, based on the assumption, that assessment and testing of students’ learning will improve academic outcomes.

## Introduction

During the last two decades, government educational policies worldwide have articulated initiatives to encourage creativity and innovation by incorporating entrepreneurial competences and aptitude into curricula, and at the same time we experience a rise in the level of international educational competition and comparison, based on the PISA testing by OECD (Organisation for Economic Cooperation and Development), which marked an ongoing shift in European and global educational policy and a rise in interest in the measurement of educational outcome (Grek, 2014). The measurement of outcomes and correlation with the “input” is central to educational research which aims to provide an evidence base for practice in education. This transnational evaluation procedure is following one single measurement standard which is common for all, and which does not reflect cultural differences and pedagogical opinions.

The purpose of this paper is to discuss the pedagogical implications for “Bildung” as these dominating – and potentially contradicting – global educational discourses have a growing impact on the educational policy and practice in the Nordic Countries (in this case: Denmark, Norway and Sweden). The term “Bildung” refers to self-cultivation – a process of transformation, both personal and cultural, through education. In order to analyze the general educational aims and conditions for formatting or cultivating the innovative student it is then important bearing in mind that education from this perspective is not just about *what* students learn, but also what they learn it *for*<sup>1</sup>.

The innovation discourse on the one hand, stresses the importance of idea-creation, creativity and innovation. The evidence discourse, on the other hand, tends to stress the importance of basic skills, competences and learning outcomes, based on the assumption that assessment and testing of students’ learning as the measuring of input-output data will improve learning and effectiveness of education<sup>2</sup>.

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<sup>1</sup> These questions are inspired by Gerd Biesta reclaiming a new language for education in an age of learning. (Biesta, 2005)

<sup>2</sup> This is depending on the concept of Evidence Based Practice (Kvernbekk, 2014) as EBP has become a buzzword in contemporary educational debates. The critique here is that this might imply a growing interest in testing efficiency within education

Both the innovation culture and the measurement culture may have a profound impact on educational practices from the highest level of educational policy to the practices of local schools.

The perspectives on pedagogy and innovation in this paper are based on the Didaktik tradition initiated by the German scholar Klafki, who formed the critical constructive tradition within Didaktik - mainly in order to analyze the educational conditions for “Bildung”, stressing the importance of developing the students’ ability to be critical and reflective in order to reason and qualify beliefs. Thus, education is regarded as an intentional act – linked to formation – it is expected to influence the development of character. Within this tradition, teaching becomes more than an instrumental activity – it is about the cultivation of the inner life: it includes social pedagogy<sup>3</sup> by being concerned with students’ collaboration and communication.

Inspired by the critical constructive didaktik-position, this paper is posing the following questions: “Which agents and stakeholders influence the concepts of innovative and entrepreneurial students?” “Why are innovative skills and creativity to be developed within education?” “What characterizes the dominating concepts of the innovative, creative and entrepreneurial students?”

## Local Context: The Nordic Schools

While we may globally be using the same languages, we must be aware of different interpretations and meanings depending on culture and context; consequently it is relevant to introduce pedagogical concepts in the Nordic countries by describing the contexts for pedagogical innovation.

In the Nordic countries, the states have been known as major socio-political attributes of the Nordic model, and earlier Nordic pedagogic progressiveness was borrowing elements of international influences, at least from John Dewey (1920) to Paulo Freire (1970) but especially from the German tradition of “Bildung”<sup>4</sup>.

Education in the Nordic countries is characterized by free public access to schools and universities, little grading, and a welfare-state in which education is seen as fundamental for social progress and equality. Every citizen should have the same opportunity to learn, regardless of socio-cultural background. Education is seen as an instrument to even out social inequality. Most schools are publicly financed, there are no private universities, and no one is allowed to charge tuition. Until recent years, the Nordic schools in general had few national tests, and they developed a self-understanding of educating creative students. Since social learning and democracy in general are reflected in the instructional processes at Nordic schools<sup>5</sup>, students as well as teachers influence their lessons by setting objectives and defining the course content and the appropriate teaching methods.

Both the need for innovative entrepreneurial students and international comparisons may challenge the dominating concept of pedagogy as the new policy implies that the Nordic countries must improve their scores in PISA testing and be innovative and creative in order to be competitive. Collaboration and partnerships between private and public actors as well as specific funding to enhance innovation are relatively new phenomena, as is the growing interest among the Nordic Schools for evidence of “what works best”. This movement is further stimulated by ongoing PISA comparisons and OECD-rankings, which place the Nordic countries (except Finland) below the “expected score”, according to previously made investments.

Along this line, the department for culture and education of The Nordic Council<sup>5</sup> discussed the challenges in trying to fulfil demands from a “test-culture” while they also emphasized the importance of a liberated and free problem-oriented and creative approach to learning. An Icelandic member of the Council concluded that the fostering of creativity and entrepreneurship must be considered in order to

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<sup>3</sup> Pedagogy is not to be understood in the notion of schooling, as in the English language, but in a wider understanding linked to Bildung- to the cultivation of the inner life, of the human mind or human soul.

<sup>4</sup> In the Danish Primary and Lower Secondary School, pupils are not divided and segregated, and they are not to be graded before the 8th grade, as it is assumed that grading might have a negative influence on students’ self-perception as well as the learning climate in schools

<sup>5</sup> The Council has 87 elected members from Denmark, Finland, Iceland, Norway, Sweden, the Faroe Islands, Greenland and Åland (only Norway and Iceland are not EU member states)

keep a balance in education. The factual knowledge, tested by PISA, shall leave room for innovations and creative thinking (Norden, 2012; Nordisk Ministerråd 2011 ). The Council does not problematize international evaluations but claims that PISA must improve the way it evaluates in order not to underestimate the importance of creativity.

There are several important stakeholders influencing the concepts of innovation and entrepreneurship in education besides national governments, the European Union (EU) and its 28 member states. In Spring 2008, the European Council stated that European citizens' potential for creativity and innovation is essential for future growth. Member States and the Commission were requested to develop evidence-based education policy, relating to creative and innovative skills and to support research on the promotion of those skills, fostering creativity and innovation at all levels of education (Ferrari et al. 2009; Den Europæiske Unions Tidende, 2008).

After reviewing the development of political and policy-related claims around the issue of comparative testing and the parallel request to foster creativity and entrepreneurship in teaching for the Nordic countries, I will continue to present significant global actors campaigns and movements aiming to set the agenda in education in order to create a competitive economy.

## How to build the human capacity for innovation through education?

Educational politics seem to reflect the neoclassic economic-orientation endeavours to understand the economic aspect of creativity through its contributions to entrepreneurship, and the way in which it may foster innovation, enhance productivity and promote economic growth (Peters, 2013). Creativity, knowledge and access to information are recognized as powerful engines to drive economic growth and promote development in a globalizing world.. This may imply cultivation and development of new labouring subjectivities (Peters, 2013) caused by the radical transformation of the production processes in order to facilitate the “immaterial labour” of the knowledge society. The need for creative and innovative subjects is reflected in the policies of both the European Commission (EC) and the Organization for Economic Co-operation and Development (OECD). Both encourage enterprise in schools, colleges and universities as a means of “boosting” innovation to ensure economic growth and global competition. The Nordic educational system seems to be influenced by the Nordic Council, the OECD, and the EC, as well as by private sector investments and non-governmental organizations (NGOs) which are addressing needs and barriers to education by stressing the need for new teacher recruitment and training strategies. Among these NGOs are the global companies Cisco and Young Enterprise, who have shown a great interest in promoting innovation and the profiling of educational entrepreneurship in education.

### Cisco

International organization and companies are striving for making an impact on education in collaboration with national authorities. One example is the ITC company Cisco<sup>6</sup>, who is member of the strategic Council for the Partnership for 21st Century Skill. The consortium includes representatives from companies such as Intel, Microsoft, Adobe, Apple and Dell as well as companies like Lego and Walt Disney. This consortium has developed a curriculum framework for American education. It is used to lobby US state and federal departments of education to adopt their framework. (Cisco, 2008). They are suggesting more project-based and cross-disciplinary tasks to encourage innovation and cross-cultural collaboration. In the report: “Equipping Every Learner for the 21st Century” Cisco is stressing the importance of creativity and innovation and the need to rethink teaching, curriculum, assessment, and accountability, in order to develop new skills and pedagogy worldwide. Technology plays an important role in the development of “21st century skills” combined with a more project-based education and cross-disciplinary tasks in order to encourage innovation and cross-cultural collaboration. Students’ knowledge must develop in such a way that they can solve real-world problems. Here, elements of a progressive pedagogy are recognized, but the report also refers to (new) performance measures, and accountability for outcomes. Teachers, pedagogy, digital resources,

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<sup>6</sup> Cisco was founded in 1984, it has a revenue: \$12.4 billion and employs 75,049 people (Cisco, 2014).

and measurements are to be changed, but still accountability is mentioned as an important aspect of “the 21st century skills” in education:

- Teachers: Great teaching is at the heart of successful learning. Great 21st century teachers will weave 21st century skills into core subjects through new pedagogy, enlivened by collaborative technologies. New and proven instructional approaches and digital resources will become a core toolkit for 21st century teachers. This transformation will require new forms of teacher training and professional development.
- Curriculum and assessment: In the future, curricular reform will most likely be required to balance core subjects and new 21st century skills. This will also require fresh thinking about performance measures to overcome legitimate concerns that there has been limited progress toward recognizing and rewarding skill development that cannot be detected in an end-of-term assessment.
- Accountability for outcomes: Accountability will be more essential than ever in 21st century education systems. School leaders will be accountable to students; questioning if school is staying relevant to their lives. Policy leaders will be accountable to employers and citizens; questioning if the system is effectively preparing young people to help meet national aspirations. It will also be important to measure accurately the impact of new skills and pedagogy in the classroom to bring about new and improved outcomes. (Cisco, 2008; p.15)

## Young Enterprise (Y.E.)

Another significant and influential actor in the Nordic schools and education system is the non-profit American organization Young Enterprise, Y.E. The trust is promoting a more practical and energetic result-orient attitude towards entrepreneurship education and is trying to create a close cooperation between education, society, and industry in order to create a working-life orientated learning environment in education. Young Enterprise is involved in strong and influential partnership at all level with politicians, educational authorities as well as teachers. According to Young Enterprise (Young Enterprise, 2014) in total, 3.8 million young people aged 4 to 25 have taken part in Young Enterprise programs over the last 50 years worldwide, which indicates that governments around the world have increased investment in enterprise education.

Young Enterprise is a founding member of Junior Achievement Europe which began work in 1977. It has expanded to include organization's spreading across 39 member countries.

Y.E. provides grants and pedagogical support to schools and students at all levels in the Nordic Countries, as well as in Great Britain, New Zealand, and Australia. In Denmark, the organization is handling the funds for entrepreneurship education in primary, lower and upper secondary school, in close cooperation with the Ministry of Innovation and the Ministry of Education. Young Enterprise Trust offers ready-made entrepreneurial programs, including competitions, talent programmes, etc. to schools and high schools in order to stimulate the interest in new business and innovation.

Young Enterprise in Denmark aims at defining entrepreneurship from a wider understanding of the concept, pointing out that its aim would be the transformation of ideas and opportunities into value for others, while this value may be of financial, cultural or social origin. Y.E. indicates that entrepreneurs may be motivated both by money, altruism and idealism.

## The Applied Concept of Entrepreneurship

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The pedagogy stimulated by Y.E. stresses the importance of creative action as well as entrepreneurial thinking and acting. Collaboration with the business world is highlighted as important and the attitude of teachers as essential. Since the teacher is expected to act as a role model – she/he has to be entrepreneurial in order to inspire students to think and act entrepreneurially. But what does it mean to be an entrepreneurial student?

A semi-systematic literature review of entrepreneurship education (Mwasalwiba, 2010) found a variety of understandings of the concepts of entrepreneurship from ability to business formation, opportunity recognition and managing existing small firms as well as transforming student's attitudes

and values to being more positive towards entrepreneurship. The majority of included literature related entrepreneurship education to educational processes that aimed at influencing attitudes and their values. The review showed, that

[...] 32% of the reviewed articles related entrepreneurship education to some kind of educational (or training) process that is aimed at influencing individual's attitudes, behavior, values or intentions towards entrepreneurship either as a possible career or to enhance among them an appreciation's of its role in the community (i.e. creating an entrepreneurial society). This educational view is an exhibition of scholars partial convergence towards a behavioral view of an entrepreneur, but at the same time being skeptical to strictly associate it with new venture creation as a sole educational object. 32 % related entrepreneurship education with acquisition of person skills in entrepreneurship, while others related it to new business formations (18 %), opportunity recognition (19%) and managing of existing small firms (9%). (Mwasalwiba, 2010; p. 3)

A study in the U.K found that Y.E. courses (which in this study is an optional activity) foster positive attitudes towards self-employment and greater enterprise potential than can be observed in non-participants (Athayde, 2009; Jones and Colwill, 2013). As entrepreneurial potential is different from actual entrepreneurship, it is difficult to measure and document effects of entrepreneurship education.

The review by Mwasalwiba concluded that the majority related entrepreneurship education with acquisition of personal skills, without discussing what it actually means to be entrepreneurial and what might be the cultural, ethical and environmental etc. consequences of fostering an entrepreneurial mindset. Such educational issues are essential to deal with within the frame of a Bildung tradition as it is dealing with the question, what students are learning for.

Y.E. thus represents an interpretation of educational goals, which might differ from some teachers' concept of entrepreneurship. To capture teachers' perceptions in order to see how entrepreneurship is interpreted in the school culture, a Finnish Ph.D. research shows that teachers tend to focus on other goals within entrepreneurship rather than economic ones. They stress, for example, that entrepreneurship education pertains to spurring students to personal and social development. Students should, through activity, authenticity and an auspicious atmosphere be enticed to take the initiative and be creative, and to develop self-confidence and self-reliance and interdependence (Backström-Widjeskog, 2008; 2010).

Interestingly, the different actors and policymakers do not seem to share the same concept of innovation or entrepreneurship – there are different understandings of the concept of being entrepreneurial among teachers and scholars. Y.E. stresses the influence on the individual's attitudes, behavior, values, or intentions towards entrepreneurship, while the ICT company Cisco emphasizes the importance of ICT, collaboration, internationalization, cultural knowledge, and cross-disciplinary project work in order to meet the 21st Century skills. To Cisco, the innovative students are self-directed, collaborative and prepared to operate on a global labour market.

## Entrepreneurial formation and Bildung

Historical formation ("Bildung") is the dealing with "self-creation" and cultivation of human minds which includes cognitive aspects (understandings and beliefs) and affective elements (emotions) as well as behaviour (actions). Education strives for influencing students' understanding and belief systems as education is expected to develop human values to support social and ethical judgments in order to be educated. Consequently it is relevant to include cultural ethical and democratic consequences when fostering an entrepreneurial mindset within education.

Klafki describes formation as the opening of a physical and mental reality to students of the objective or material aspect (content) and at the same time the creation of a developmental opening for the student of the object - her reality – in order to unite the subjective and formal aspect. "Bildung" then has to occur when content and students meet, depending on how the students react to the content and their perception of its relevance. Students have to be engaged in the learning process in order to be educated, which implies that it needs to be relevant for the student. Didaktik then has to relate content (objects of learning) to students (subject of learning), and within the Nordic tradition it is the teacher's role to arrange this encounter. The "how" is then primarily to be decided by the teacher as there is a

long tradition for accepting the teacher's freedom of methods choice in order to arrange this encounter.

The pedagogy may then respond to the needs of society as well as what students bring into schools. Since the concept of Bildung refers to the transformational potential in education, teachers are dealing with questions like, "what should students know" as well as "what should they become"? (Though such questions are not only to be answered by the teacher). This is different from an Anglo-Saxon curriculum tradition due to the focus on curriculum and application of educational goals and pedagogical methods with preference for observable output in the former and formation in the latter (Klafki 1996).

According to Klafki, the main attributes of the didaktik-tradition are as follows:

1. Clarification of the preconditions, opportunities and limits of the pedagogical practice
2. Emphasis on the relative autonomy of educational theory and practice in relation to all other political, social, and cultural influences. The claim to relative autonomy was understood as relative independence, following the tradition back to Rousseau and the Enlightenment, and deriving from the responsibility of pedagogical theory and practice to provide opportunities for human beings to develop towards a state of independence and responsibility for their own actions ("The Kantian concept of Mündigkeit").
3. Fundamentally, Didaktik is a discipline within the humanities. Therefore, educational theory and practice is to be understood in a historical context". (Klafki, 2002; p.318)

Later, inspired by critical theory/the Frankfurt School, Klafki revised his theory of "Didaktik" into critical-constructive didactics, which means that educational theorists and practitioners have the task and the opportunity not only to respond to social conditions and processes, but also to judge and influence social conditions in order to attain the best for young people by providing opportunities for self-determination, co-determination, and solidarity:

By self-determination and co-determination I mean the development of individual responsibility and independence and the development of corresponding economic, social, political and cultural conditions. The subject, the individual as a person is always influenced by history and society, is 'mediated', yet is never completely absorbed by his social role, is never determined by society alone, but in principle always has opportunity to criticize society, to take action with a view to change, and to make independent decisions.(Klafki, 2002;p.311)

Klafki stresses that the term 'constructive' should not be misunderstood in a technological sense, "didactical theory cannot provide the practitioner with rules etc (...) which guarantee that instruction will produce these abilities" (Klafki, 2002; p. 312). Following Klafki's conceptions, the professional autonomy of educators is essential, as the teacher has a great responsibility to ensure the development of students – based on both objects to study and the student's development as a subject.

Politicians as well as international operating "significant actors" (Philips, 2005) show a growing interest in how the professionals manage this autonomy, indicating the recognition of teachers influence on students development (Ottesen, et al., 2013). Global political initiatives to promote entrepreneurial behaviour in education tend to affect operations on minds, thoughts, conducts and ways of being; this formation process may be regarded as an example of governing the "self-government" in which students shape and reform to satisfy the demands of the modern society by changing the way in which they will govern themselves. So how is the global need for innovative and creative students reflected in the national legislations - what does it imply to be an innovative and creative student in a Danish context?

In Denmark, the innovation discourse is formulated as a need for "stimulating students' ability to think in new ways, observe new possibilities and to transform ideas to value". [Students must] "be able to think on their own, to handle insecurity and to set ambitious goals and reach these" (Ministeriet for Videnskab, Teknologi og Udvikling, Danmark.,Forsknings- og Innovationsstyrelsen,. 2009;. p. 4). But also the student's "desire for being entrepreneurial" must be stimulated. This policy is now reflected in the legislation for teacher training programs, which says that teacher students must develop the students' innovative and entrepreneurial competences, and strengthen students' "desire to learn and motivation for acting" (Læreruddannelsen,2013) From this perspective it is relevant to discuss how the formation and creation of the innovative student should be carried out, since this educational discourse deliberately intends to influence the student's interpretation, construction of meaning, and actions, in order to secure the nation's position in the global economy as being very

innovative and creative. In other words - creativity has to be found and to be nurtured, stimulated and encouraged in education, in order for us to be able to compete and to secure welfare.

Danish educators are hence expected to stimulate their students' ability to think in new ways, observe new possibilities, in order to transform ideas to value. The students must learn to set goals and reach these, and they must be able to handle insecurity while being stimulated to becoming entrepreneurial within an interdisciplinary context. The student is expected to develop an "enterprising self" and a desire and will to be innovative. Consequently, the innovative student must be able to think on his own in order to fulfil educational goals and expectations. But how is the student supposed to create both will and desire – since "will" pertains to intentional and voluntarily committed action. A student's will must be present in order to act deliberately and it pre-describes personal, deliberate decisions and freedom of choice – if the politics imply students must have the will to innovate, then this is no longer a decision of the student's which violates *Bildung* as it means to educate the will as a will to do the right things as well as the will to choose, which implies the freedom of choice (Uljens, 2006). From Klafki's point of view it is essential to involve the students in the setting of objectives and instructional themes by encouraging students to participate in the educational planning process and hereby provide opportunities for self-determination by adding co-determination and solidarity as formation ideals to strive for in order to create a democratic society.

This implies that the educational political goals have to be accepted by the student and reflected in the pedagogical process in order to fulfil these ambitions. It needs considerations about the concept of society, creativity and innovations in order to become aware of what it implies "to think creatively", "be flexible", "take initiatives" and find "solutions", and how it might be appropriately expressed in a given educational context.

## How to support innovative learning and creativity?

On the micro level, the Nordic schools reflect different ways of supporting innovative learning. Either it is integrated into curricula or through extra-curricular activities, or through the use of both strategies. We have noticed different interpretations of how to develop the students' innovative skills and how to define which skills are needed. Within entrepreneurship education, enterprises articulate the need for the development of skills for entrepreneurship aiming at creating more entrepreneurs. This education emphasizes the market and the economic aspects of being entrepreneurial related to a real business context by establishing own enterprises through practical enterprise initiatives in a commercial environment. The other discourse is oriented towards entrepreneurial and innovative learning by being student-directed, aiming at stimulating the students' involvement, curiosity and action by being problem-oriented, collaborative and dealing with authentic problems within education. Both trends are regarded as a challenge in some educational cultures, since it may also imply a change in school culture. Whether one prefers one or the other of the pedagogical approaches seems to be dependent on how one regards the connection and link between creativity and the fostering of an entrepreneurial mindset.

By aiming at creating more entrepreneurs, competition is introduced as a pedagogical method. Students are being nominated and rewarded as being more or less entrepreneurial (or talented) due to the products/solutions to a problem they have invented. These competitions create the possibility for students to experience and format themselves as being entrepreneurial (or the opposite) since the concept of being entrepreneurial tends to be related to personal skills and attitudes.

But by focusing on the development of entrepreneurship and the entrepreneurial mindset it might be overlooked that innovation is strongly associated with the development of physical products and technology, while creativity on the other hand seems to be associated with mental aspects, such as the ability to come up with new ideas. This is different from the development of personal skills and attitudes. While innovation then is linked to invention and problem-solving, this does not seem to be the case when it comes to creativity, although innovation and creativity are linked as Innovation processes involves the utilization of ideas in solving problems and improving the way we do things in creating new products and services (Andriopoulos and Dawson, 2009).

The concept of creativity itself is not new to schools and education as it linked to artistic subjects. Creativity is also related to cognition: problem-solving and creative thinking, which imply the ability

to free oneself from conventional thinking. Creative thinking shows in the ability to solve complicated problems as well as the ability to define problems in real life, which are often ill-defined or vague (Amabile, 1996; 1998; 2001; Sawyer, 2006). In order to solve such (self-defined) problems, re-framing during the problem solving process is needed. Besides knowledge, creative processes activate emotions and attitudes like persistence and motivation and may create flow when the right balance between challenge and skills is met. If the challenge is too big, there is a risk that the students give up too easily; if the challenge is too small, it prevents the students from being involved (Csikszentmihalyie, 1996; 1997).

Creativity seems to be linked to personality, domain, cognition, problem-solving and problem finding, as well as idea-creation and idea-evaluation and selection within the context in which the problem is to be defined, solved or expressed. It is a challenge to create authentic learning situations and creative processes that offer the students the ability to identify a problem and come up with new solutions – in other words – they need some kind of engagement if creativity is to be developed. Creative thinking may include both critical thinking and imagination, besides skills and knowledge, consequently students must experience situations in which they are given the opportunity to explore their world as problem-oriented learning implies.

In order to evaluate creativity the creative product and its value is to be judged, as the product must have value for someone. It seems to be a complex matter to define and compare creative products in order to judge and document students' creativity due to value. How is the educator to assess and compare the best solution to different problems? In other words: how to define general criteria for measuring and evaluating and grading creativity? Creativity is not to be measured without being subjective, as the value of the innovation is a parameter for being labelled "innovative". Which elements may be valued when attitude is to be measured?

- time spent on the process,
- effort (although the project was not successful – indicating risk taking)
- collaboration,
- persistence,
- originality - or critical thinking?

In other words, is creativity to be measured by the product itself, by personal skills, personality etc. Is this measurement to be performed out of context or does it have to reflect the local culture and context in order to be recognized?

These pedagogical questions emphasize the complexity of organizing learning processes to form creative as well as innovative and entrepreneurial students within a frame of measuring students' outcome. Furthermore, this implies that students, (as well as educators) in order to reach the educational goals, must have the liberty to explore and to choose different means in order to participate in, and create creativity-enhancing learning processes. The same liberty is required for them to learn how to set their own goals, take risks and make mistakes in order to experience consequences of different actions as well as interactions.

The need for creativity development then challenges educational traditions for comparison and assessment of students by pre-set goals, which in turn emphasize output evaluation and clear prescriptions for the students' delivery and performance due to practicalities.

## Conclusion

In order to stimulate innovation and entrepreneurship globally, education seems to be regarded as an investment and students as important and valued human capital. This paper has presented global visions for the development of innovation, creativity, and entrepreneurship by significant actors in order to stimulate the student's creativity and innovative skills. The intended transformation process is heavily supported by specific funding and powerful actors operating internationally. Especially the non-profit American organization Young Enterprise seems to gain pedagogical influence in the Nordic countries as it is handling the funding of specific programs in which innovation is expressed by emphasizing the importance of an entrepreneurial mindset and it supports competition-oriented cooperation within and between students in close cooperation with state and industry (Ministeriet for videnskab, teknologi og udvikling, 2009; Globaliseringsrådet, 2006).

Educational documents and international policy documents imply that creativity can be learned and developed over the lifespan (Cachia et al. 2010; European Commission, 2004; Ferrari et al., 2009) as well as it is stated that especially talented and gifted students should be nursed by being offered specific programs, in order to take advantage of their creativity.

Since the Nordic school has a strong emphasis on equality as well as a long tradition for being opposed to competitions as a pedagogical methodology, this educational mentality meets some resistance as schools are striving for inclusion and trying to avoid segregation; and programs for gifted children are rare.

The educational mentality in Europe has also reflected a discourse on competition, internationalization and efficiency promoted by PISA evaluations in which students, schools and nations compete. This may in the end lead to an increased homogeneity in pedagogical practice and maybe less creativity an innovative learning. Hence, the innovation discourse may challenge the evidence discourse which stresses the importance of basic skills, competences and measurement of learning outcomes. In order to control the educational practice by aiming at measuring output, students as well as educators may perform within an educational system dominated by pre-defined subjects, goals and methods which might reduce the students' ability to choose, to handle insecurity, to take risks, and limit the possibilities for defining and setting personal goals. At the same time it is expected that education develops innovative skills and creativity and students deal actively with the world.

As innovation implies change, the ability to manage and participate in change processes – as an individual or as part of a community – should be developed as one aspect of being innovative. Economic crises and sustainability etc. indicate the future need for “participatory” skills to enable students to participate in collaborative problem-solving in order to develop more creative solutions. This may challenge the focus on the talented individual as an engine for change and innovation processes, since collaboration may be as important as competition to enhance innovation (Sawyer, 2006).

An educational culture to improve innovation and creativity may consequently allow students to be a part of a democratic culture allowing them to participate in educational processes in order to identify goals, to choose methods, in order words – be part of a learning culture which creates a space for different opinions, negotiations and collaboration. A democratic educational culture may approve of critical reflection in order to welcome responsible action and global perspectives and foster imagination which might be a central aspect of being innovative and creative in a modern and complex world. Critical thinking is a necessary step on the way towards creative thinking and innovation.

This innovation discourse stresses the importance of idea-creation, creativity, innovation, and in general, the ability to bring something new into existence – a new solution to a problem, a new artistic object or form, new methods or devices. If educators are expected to operate strictly based on methods that have proven to work elsewhere, it will be difficult to develop innovative and creative learning as it seems to be complicated to measure both creativity and the will to innovate, as innovation and creativity in essence are not to be foreseen and students as well as teachers must learn to deal with the unexpected.

This stresses the importance of the freedom of students as well as teachers to explore and set new objectives. The participants' freedom and autonomy seems to be limited by a school system aiming at ranking and testing, in securing competitiveness and leading students as well as teachers to focus on teaching the right answer to predefined problems – which may harm the development of creativity as well as critical reflection. If this is the case, then innovative students do not fit into evidence-based education.

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