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What is the relationship between knowledge and creativity in a technological youth cultural context?

Introduction

In educational theory and practice it is a widespread belief that children and adults must acquire some basic knowledge and skills in order to be creative. The idea is that creative work must be based on a knowledge area's rules, meanings, and techniques and that the creative individual must master these rules and techniques. One must for example master some technical skills in order to work creatively with painting, and one must have a basic knowledge of literature in order to work creatively with poems and storytelling. Such traditional pedagogical conceptions, however, is challenged by a number of parallel trends in late modern society:

First is seen an increasing focus on creativity and innovation in education and in working life. By that follows that originality are valued more than tradition and reproduction. Children must learn to be original rather than "just" reproducing traditional rules and meanings.

Second, the global community is in constant development. Traditional fields of knowledge are no longer homogenous and static platforms. In this view traditional didactic dispositions loses legitimacy. What knowledge and skills can be presented as central and essential, if knowledge areas are in fast development? Should children read for instance great Danish classical authors, or is such literature outdated and a waste of time? At the same time the individual must continually evolve in a changing world, which problematizes a generalized link between creativity and specific static professional skills.

Thirdly, there has been a shift in educational theory and practice from a teaching discourse to a learning discourse. Individual learning is in focus rather than the teacher and the teaching itself. In connection to this, there is an increasing interest in learning processes outside institutionalized and formal educational settings, which at the same time makes didactic, based on a static curriculum, problematic.

Fourthly, the potential of modern technology means, that basic knowledge and skills is no longer an obvious necessity. What's the point for instance to learn to write by hand, if the computer keyboard can be used? What's the point of learning drawing techniques, if the computer drawing programs can be used to create art of high quality?

Fifth, the individual copyright monopoly today is less definite. In a youth cultural technological context products is not necessarily created "from scratch" but delivered through a combination of already existing material (e.g. through copy-paste techniques). Who should be credited as the creator of a creative product, is therefore a very complex issue. Similar questions could be posed by the types of knowledge and skills such creative work must require.

Sixth, new research suggests that professional knowledge and skills is not necessarily stimulating the creative process, especially within a technological framework. Training can also maintain the individual in traditional working patterns and ways of thinking, which can hinder creative thinking.

It is therefore an unresolved issue, in what way professional skills affect the creative process, in a technological, modern and youth cultural context. A little rhetorical, one can ask, "do you have to know anything, to be able to be creative?"

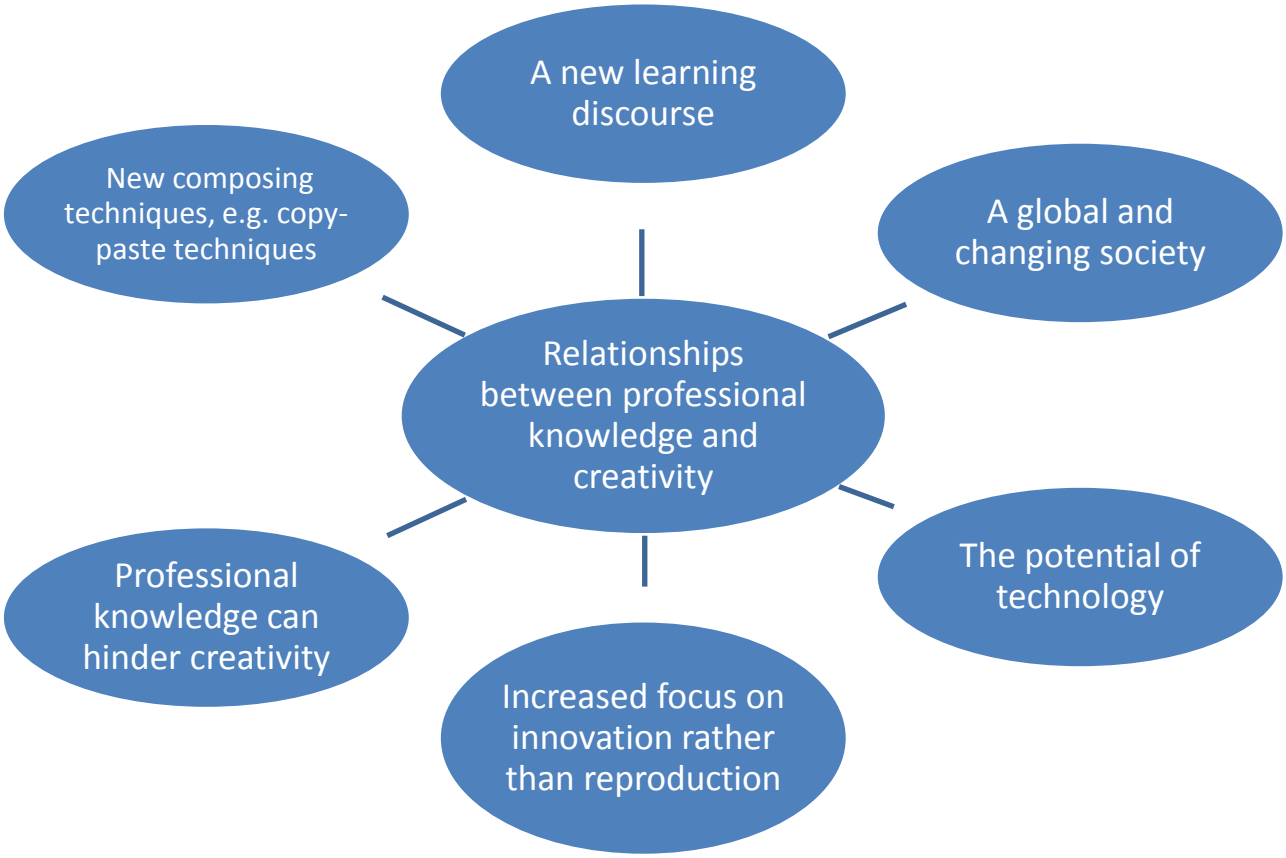

Figure 1: Traditional ideas about relationships between professional knowledge and creativity are challenged by a series of parallel tendencies in modern society.

Basic ideas about relationships between professional knowledge and creativity are in this way challenged by a reality characterized by technological innovation, a new learning discourse and a general focus on originality and innovation. Simultaneously general educative virtues and values are challenged. E.g. a pedagogical slogan such as "practice makes perfect" loses authority and must be discussed and rethought in a new perspective.

In the Danish educational environment is an intense focus on creative skills. From daycare to university creativity is highlighted. But our knowledge of the anatomy of creativity in a reality dominated by technology, globality and development is limited and filled with paradoxes. There is a need to refine our understanding of the relationship between creativity and professional knowledge

within a technological contemporary youth cultural framework. The important and general question is: How can creativity be understood and facilitated in a changing world characterized by progress and technology?

The project's main question

What is the relationship between knowledge and creativity in a technological youth cultural context? How can creativity be facilitated through technology?

The project in short

In the project students with and without instrumental skills are compared. Students compose music by computers and the work is video filmed. Twelve students from University College Sealand and twelve students from a traditional public school participate in the study. The finished compositions are evaluated in a number of social forums.

Theoretical framework - what is creativity?

In the study the concept of creativity is understood on the basis of a range of commonly accepted criteria that form the basis for the project's methodological dispositions. First and foremost creativity is defined as originality + value. A creative product must, therefore, on the one hand, be different, new and original and on the other hand, have value. Value and originality can not be examined objectively. However value and originality can be determined in a social field and/or by the creative individual. A product can then be creative in the sense, that the creative individual finds it original and valuable (also called P-Creativity). The product may also qualify as creative beyond an individual level if it receives positive assessment in a social context (also called H-Creativity). For example, a new collection of poetry judged positive in social fields, consisting of general readers, literary critics, etc.

Creative processes can’t be analyzed meaningfully in isolation as process always stands in relation to the product in progress. However, there are a number of typical procedural features of creative activity - such as experimental work, synthesis thinking, flexibility, etc. Thus, in the analysis process and product are continuously and simultaneously in focus.

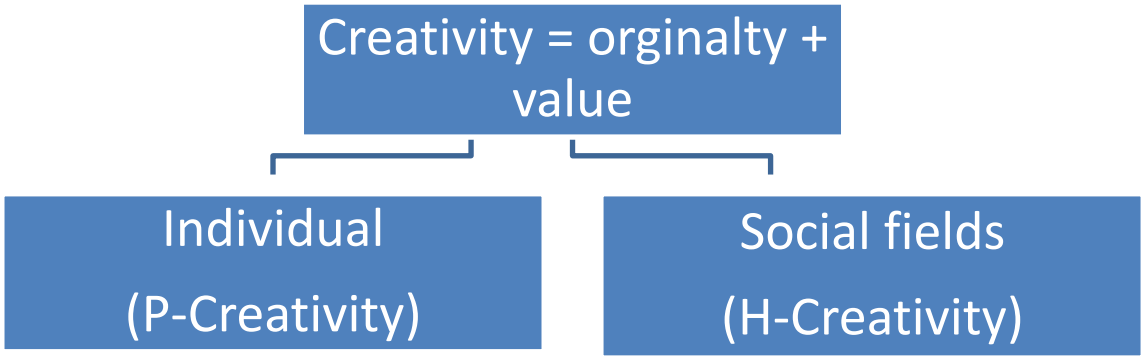

Figure 2: Creativity can be understood as originality + value and appear as the result of an assessment by the creative individual and/or the assessment in social fields

The outlined theoretical framework implies that the study focus on:

1. Processes – i.e. procedural characteristics of the participants' creative work
2. Products – the participants' products evaluated in various types of social fields (H-Creativity)
3. The creative subjects (i.e. the participants) own experiences and evaluations of process and product (P-Creativity)

The relationship between knowledge and creativity

"A person cannot be creative in a domain to which he or she is not exposed. No matter how enormous mathematical gifts a child may have, he or she will not be able to contribute to mathematics without learning its rule" (Csikszentmihalyi 1996: 29).

According to the main part of creative theorists, skills are regarded as a precondition for creativity (e.g. Csikszentmihalyi 1999, Gardner 1993, Sternberg 1999). The idea is that the creative individual must know a knowledge domain in order to create something new. Empirical evidence supporting this thesis can e.g. be found in Howard Gardner's biographical study of recognized creative individuals, such as Freud, Einstein, Picasso, Stravinsky etc. (Gardner 1993). It concludes further that the individual at the earliest can produce something original and valuable after at least 10 years of training in the domain. "Mozart, for example, who was a child prodigy from an early age, had been composing for at least a decade before he could regularly produce works that are considered worthy of inclusion in the repertoire" (Gardner og Policastro 1999: 216). A similar conclusion is found in Robert W. Weisbergs biographical study of Mozart, the Beatles, jazz musicians ect (Weisberg 1999).

This viewpoint is however challenged in different ways. Knowledge can also be viewed as somehow destructive to the creative process. Robert Sternberg describes it as follows: “Concerning knowledge, on the one hand, one needs to know enough about a field to move it forward […]. On the other hand, knowledge about a field can result in a closed and entrenched perspective, confining a person to the way in which he or she has seen problems in the past.” (Sternberg 2003: 107). Several studies support this view. In a research project by Simonton, he examines approx. 300 creative people - born between 1450 and 1850 - and their formal education (Simonton 1984). He concludes that the correlation between education and creativity graphic can be designed as a normal distribution – i.e. that the people regarded as creative, neither have much education or very little education, but rather something in between.

The theory of negative transfer is another attempt to nuance the described relationship between knowledge and creativity. Negative transfer is to be understood in the sense, that the individual reuses solutions in new situations and thus do not develop new working methods. In an experiment with playing cards made by Frensch and Sternberg, it is shown how novices are far easier to adapt to new rules than experts (Frensch and Sternberg 1989).

A number of studies of composition by computers suggest that non instrumental skills can be an advantage in a creative process (Folkestad 1996, Scripp et al. 1988, Webster 1990, Seddon et al. 2003, Hickey 2003, Hickey 1995a, Hickey 1995b).

The relationship between knowledge and creativity in a musical technological context

In the past 500 years, composing in the Western world was rooted in the musical instrument. With the spread of the computer and the increasing democratization of music programs are given a opportunity to work without instrumental skills. Today much of popular music, art music, club music, etc. is created by artists without a musical education and without traditional instrumental skills. Creativity appears in these contexts, relatively detached from a physical and cognitive rooting in the instrument. This provides a unique opportunity to study creativity from a new angle.

The theory about negative transfer is therefore highly relevant to creativity research in the IT field, since it is precisely in these contexts that traditional practice and training can be minimized. In most studies of creativity and IT is noted, however, only that the individual can "get by" without extensive skills and knowledge (e.g. see Manovich 2001, Buhl 2004, Sefton-Green 1999 and Folkestad 1996). These studies overlook in my opinion that the absent of bodily and cognitive-rooted knowledge creates a completely different foundation in relation to the creative process. A foundation that can be viewed as an advantage as well as a disadvantage.

Methodological approach

The study is balanced between deductive research logics inspired by experimental studies and inductive research approaches with an emphasis on qualitative and explorative methodologies. Thus the study attempts to answer a number of specific questions and at the same time maintain an open approach. A schematic presentation and elaboration of this approach is done in the following:

Research logics inspired by experimental studies	Research logics inspired by qualitative and explorative methodologies.
In the study is presented a series of theses, which are tested systematical – this is a hypothetical-deductive approach.	The deductive approach is combined with inductive strategies, which maintain an explorative approach to the produced data.
Participants are given specific tasks.	The specific tasks, is supplemented by tasks that are more triggered by the participants motivations and visions.
By comparing different groups of people the goal is to isolate specific factors - namely the instrumental skills and their implications.	The idea of isolating "knowledge" as a determinant factor is obviously problematic and must therefore be combined with an open qualitative approach to the participants and their competencies.

The balance between inductive and deductive approaches is inspired by Grounded Theory (as formulated by Strauss & Corbin 1994). First of all, one must mention the circular nature of research in which empirical data are analyzed along the way, then new hypotheses are generated and new empiri constructed (Boolsen 2010: 209). This approach is used in relation to the study's exploratory phase and is reflected in the design, allowing modulations of hypotheses underway. However the present study is generally more deductively based, because of the main question in the project, namely the relations between knowledge and creativity.

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