

## Creativity assessment as intervention

The case of creative learning

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### Abstract

Creativity, innovation, and entrepreneurship are among the most celebrated concepts in today's world and this places them high on the agenda in the educational system. Everyone wants creativity, but few people have suggestions as to how to proceed developing or assessing it. This leaves educators around the world with the dilemma of how to integrate creativity, innovation and entrepreneurship into the curriculum. The present paper will discuss how current definitions of creativity and creativity assessment often stand in the way of working constructively towards this goal as they typically disconnect idea generation from idea evaluation and develop creativity measures that focus almost exclusively on divergent thinking. We will argue for a dynamic type of creativity assessment that considers it a developmental rather than purely diagnostic tool. Practical concerns regarding the assessment of creative learning will support these theoretical and methodological reflections.

**Keywords** creativity, definition, assessment, intervention, cultural psychology, education

Creativity, innovation, and entrepreneurship are among the most celebrated concepts today, globally, and are high on the agenda in the educational system. Everyone wants creativity, but few people have suggestions as to how to proceed when it comes to explaining or enhancing creative expression. While psychological research into creativity increased considerably in the past decades (Hennessey & Amabile, 2010), there is still much to be understood in relation to the nature of creative work and our possibilities to assess and foster it. At a societal level, these concerns are reflected in the explicit, collective effort to find new ways of using creativity as a resource for growth and social transformation.

Many politicians, civil servants, and policy makers see creativity as the key to commercial success and education is supposed “to produce the kinds of individuals who will go on to succeed in a knowledge-based economy” (Moeran & Christensen, 2013, p. 2). Within the management literature, researchers strive to define the necessary skills of the future leader and many point towards the need to foster creative, design-thinking among employees in organizations striving to become more innovative. Design-thinking is here addressed as a particular kind of thinking often employed by designers, defined by user-orientation when designing new products and services and an abductive, constraints-driven thinking (Dunne & Martin, 2006). The basic point is that these skills are seen as relevant for all employees today, and not only for designers. All of this means that educators around the world are currently trying to find ways to integrate creativity, innovation and entrepreneurial skills into the curriculum.

However, our current definitions of creativity and innovation often stand in the way of working consistently towards this aim. For example, in the psychology of creativity, there has been a long tradition of contrasting idea generation (divergent thinking) and idea evaluation (convergent thinking), and many people believe that evaluation and judgment act as eradicators of creativity (Sawyer, 2013). However, we know from studies on design thinking that innovators often employ both abstract and concrete as well as analytic and synthetic thinking (Beckman & Berry, 2007) and assessment studies show that evaluation and learning are closely connected because evaluative practices inform and structure what is learned by students (Tanggaard & Elmholdt, 2008); moreover, a great number

of different evaluative processes are necessary for good creative work (Sawyer, 2013). Accordingly, it is timely to reflect on the evaluation of creativity and how this can be seen as integrative to creative learning processes within the educational environment in order to coordinate our theoretical efforts of defining creativity and fostering in within learning communities. We take as a starting point in this article the broad definition of creativity elaborated, within the educational setting, by Plucker, Beghetto and Dow:

“Creativity is the interaction among aptitude, process, and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context” (Plucker, Beghetto and Dow, 2004, p. 90).

In the following, we will proceed by introducing a story of the lack of assessment of creative learning told by the participants at a workshop conducted by the first author. The story concerns the difficulties faced by teachers who would like to recognize creative learning while experiencing that standardized curriculum goals often work against this. Thereafter, examples of assessment of creativity in psychology, mainly in the form of tests of divergent thinking, are presented. In the final part of the paper, our model of dynamic assessment of creative learning is introduced and discussed as one way forward in the attempt to reconcile dilemmas related to the assessment of creative learning in teaching situations. The sociocultural framework of creativity assessment we advance in this paper moves beyond an exclusive focus on the individual being tested or the test itself to account for the role of others in the testing situation. This perspective challenges the existing separation between assessment and intervention and considers them inter-related in an ever-advancing cycle of observation, evaluation, and enhancement.

**“We would so much like to change the standards....”**

The above sentence is a direct quote from a teacher telling the first author about real-life challenges related to the assessment of creative learning in a higher education context. Having done more than 100 workshops during the last years with practitioners on the topic of creative learning, one controversial and difficult aspect tends to

come up again and again: the assessment of creativity. How to measure creativity, what to look for and what to do as a teacher? Indeed, teachers do engage in a wide variety of evaluative practices when they strive to recognize and understand what students do. The main trouble with assessing creative learning is that this is a process that generates something new which can therefore be difficult to assess by using existing standards. At a recent workshop with teachers at a Nursing College in Denmark, the above issue came across as highly topical. A group of teachers said that they had begun experimenting along the lines of inquiry learning often described as facilitating creative learning (Tanggaard, 2014), but they felt the existing curriculum standards worked against this. As they explained it:

“During the last few years, our curriculum has become more academic. Our students are expected to gain competence in using scientific methodology. They are supposed to write about this very close to the style used in academic journals. However, our feeling is that it is sometimes very hard for the students to actually meet these demands. The quite strict requirements related to the justification of methodological approaches applied in their projects sometimes hinder students in approaching their project topic in more creative ways. Also, we fear that the practice field does not really gain anything from this. We are currently widening up the gap between school and the field of practice rather than creating the kind of boundary crossing and mutual connections we are also aiming for. We would therefore very much like to change this, to open up for less restrictive and more open approaches to methodology. In our opinion, this would allow for better relations to the field of practice and more open and improvisational projects. Furthermore, this can actually be part of ensuring that the students gain competences within creativity and innovation which are highly relevant for a constantly changing practice. But how may we do this?”

This dilemma voiced by the teachers in the workshop was connected to the increasingly academic profile of nursing education in Denmark. The teachers related creative learning very much to student

projects creating something new, often in collaboration with practitioners, while the official curriculum goals tend to focus on students' ability to work with research methods in an academic fashion.

The author's response to the dilemma posed by the teachers was actually twofold. First of all: Is it a real problem? Would it not be possible to interpret curriculum goals related to research methods so that they fit the goal of creative learning? Indeed, researchers often creatively change their research design in response to the requirements of the tasks encountered, so creative work is very often closely intertwined with research. And secondly: What can be done to change the curriculum goals so that they fit the ambition of promoting students' creative work? However, while driving home, I (the first author) began to reflect on the story told by the teachers. Is the whole act of setting goals or striving towards more academic standards in the curriculum actually detrimental to promoting creativity? Can teachers do more to dynamically access the potential of students' creativity as an integrated aspect of learning as such? Would it actually be beneficial for the teachers and the students to work with an explicit kind of goal-setting and testing for creativity? Do they have, in methodology projects, to work within the boundaries set by a competence-oriented curriculum or are there other ways forward? In essence, many shortcomings associated with the evaluation of creativity come from a strong association with testing or from a disconnection between disciplinary subjects within a given curriculum, on the one hand, and creativity understood as a general psychological cognitive process on the other. It is therefore important, before questioning current forms of assessment, to understand better the logic of psychometric evaluations and their use by psychologists as this lays the ground for the above-mentioned problematic in education.

### **Creativity assessment in psychology**

Any effort to assess or measure creativity should necessarily begin with observing and understanding the everyday activities and discourses that are shaping this practice and, in turn, are shaped by it. In our case, we should start from an in-depth exploration of the particular educational contexts and what is specific for them, for the students involved and for their learning activity. In contrast, most widely used creativity tests are usually built based on a gen-

eral conceptual model of what creativity is (e.g., Guilford's model of the intellect), rather than take a bottom-up, practice based approach. This leads to the easy assumption that creativity tests assess something 'universal', in contrast to a contextual, situated perspective that would direct researchers towards what children and students 'do in context' and how their activity is 'seen' by others (Tanggaard, 2014; Glăveanu, 2014).

There is a great consensus among scholars that creative products are described by both novelty and value (Sternberg & Lubart, 1995). The exact nature of the process leading to such outcomes is however less clear, and a long tradition points towards divergent thinking (DT) as a key factor of creative potential (Guilford, 1950; Runco, 2010). Paper and pencil tests of divergent thinking are extremely common in the psychology of creativity and in educational settings (Zeng, Proctor & Salvendy, 2011) and they typically invite participants to generate as many ideas as they can in response to verbal or figural prompts. Responses are subsequently scored for fluency (number of ideas), flexibility (number of categories of ideas), originality (rarity of ideas), and elaboration (completeness). This kind of practices are becoming more and more common in educational environments, including in Denmark, although access to actual testing instruments – and especially batteries that have been validated for the local population – is rare and often teachers are left to create their own tasks or apply the testing criteria to whatever product the students are working on. This is not an advisable practice for several reasons, most of all the fact that the logic of psychometric measurement, with its strengths and limitations, should be well understood by the teacher before being used as part of any assessment.

For example, the best known instrument in this regard is Torrance (1966)'s Tests of Creative Thinking (TTCT). The TTCT has two forms (A and B), both including verbal (ask-and-guess, product improvement, unusual uses, unusual questions, and just suppose) and figural tasks (picture construction, picture completion, and repeated figures of lines or circles). It is, by far, the most popular instrument for assessing creativity (Davis, 1997), particularly in educational settings. The TTCT can be administered as an individual or group test, from kindergarten up to graduate level (and beyond). Despite ongoing discussions concerning its validity, reviewers tend to agree that this is "a good measure" for both discovering and encouraging crea-

tivity (Kim, 2006, p. 11). While a central feature of the TTCT relies on asking participants to generate ideas and solve problems, it is not just divergent but also convergent/evaluative capacities that are important for a comprehensive study of creativity (Rickards, 1994) and, as mentioned earlier, both divergent and convergent skills appear to be necessary in almost every innovation process (Beckman & Barry, 2007). This double focus is what distinguishes the Evaluation of Potential for Creativity (EPoC; Lubart, Besançon & Barbot, 2011) from other creativity measures. In the words of the authors, this is a “multifaceted, domain-specific, modular test battery that allows evaluators to capture the multidimensionality of the creative potential and to derive profiles of potential for creativity” (Barbot, Besançon & Lubart, 2011, p. 58). With tasks covering the graphic/artistic and the verbal/literary domains (soon to be joined by the musical and social domain), EPoC can be used with children in elementary and middle-school – kindergarten to 6th grade.

What teachers should know is that divergent thinking tests, for as popular as they are, have been also subjected to repeated criticism in psychology (see Simonton, 2003). Zeng, Proctor and Salvendy (2011) listed in this regard six major limitations, namely: lack of construct validity; not testing the integrated general creative process; neglect of domain specificity and expertise; and poor predictive, ecological, and discriminant validities. Nevertheless, other scholars responded to these claims (see, for instance, Plucker and Runco’s, 1998, article ‘The death of creativity measurement has been greatly exaggerated’) by showing that, although not perfect, creativity tests are actually valid, reliable, and practical. For Runco (2010, p. 414), “the research on DT is one of the more useful ways to study ideas, and therefore creative potential, as well as our more general everyday problem solving”. And yet, if we are to connect to the concerns expressed by teachers during creative learning workshops we still need to ask a fundamental question: how can psychological assessment be used practically to help students? How can it be used to tell us something meaningful about their capacity to create, innovate, or be good entrepreneurs? Moreover, how can this be done in the context of a rather rigid curriculum constraining what activities teachers can integrate or evaluate? Our answer to this pressing question is that it is possible to use assessment as a form of intervention but, in order to do this, we would first need to reflect

on the principles behind traditional creativity measurement and re-think them.

### **A new look on creativity assessment in education and beyond**

Studies of the learning processes involved in innovation (Beckman & Barry, 2007) point towards the need to give consideration to the very diverse set of skills necessary to succeed and to teach teams to pay due attention to both divergent and convergent, analytic and synthetic skills. The key is to develop teams willing to learn and collaborate in the complex, real tasks required by producing new and valuable products and services. This means that they must constantly be willing to assess their own work processes and change them in a dynamic manner, according to the given task. But how can we teach students to acquire this kind of adaptive, creative and flexible thinking?

Focused on dynamic models, cultural psychology, as well as situated accounts of learning, is highly concerned by traditional practices of assessment and their decontextualized approach to individual performance. For example, Cole (1996) challenged the mainstream psychometric tradition with the means of ethnography, showing that the instruments we use to assess intelligence propose a definition that is foreign to non-Western populations. For a psychologist, working in educational settings, assessment is or should be closely related to learning, not only as a 'measure' of its performance, but used as an opportunity for its development (Black, Harrison, Lee, Marshall & Wiliam, 2002; Shepard, 2000). The novelty of this approach resides in the fact that, on the one hand, it expands the traditional focus of assessment from student to 'learner in context' (a context that includes students, teachers, parents, as well as the institutional and cultural frames of education) and, on the other, it proposes to integrate assessment activities within the teaching and learning process in ways that make evaluation not a separate activity in school but an integral part of educational practices aimed towards understanding and fostering creativity.

### **How is this possible at a practical level?**

In building a sociocultural psychological approach to creativity assessment we could start from a similar premise as Moss, Pullin, Paul



Gee & Haertel (2005, p. 77) who eloquently argued that “testing shapes people’s actions and understandings about what counts as trustworthy evidence, as learning or educational progress, as fairness or social justice, and as appropriate aims for an educational system”. From this position, unpacking creativity assessment requires an in-depth exploration of its premises and implications. The test itself is part of a wider network of ‘actors’, including psychologists, teachers, parents, etc., as well as lay and scientific representations of what creativity (or the ‘creative person’) is. Moreover, the activity of testing (creativity evaluation) represents only one moment within a cycle that reunites observation (of current creativity practices) and enhancement (of creative potential and expression). In agreement with Houtz and Krug (1995), we share the view that creativity tests “might best be used to help ‘awaken’ creative thinking in individuals” (p. 290). Figure 1 below captures this intrinsic relationship that points to the intricate and continuous inter-relation between processes of observation, evaluation and enhancement of creativity in educational practice. In addition, it shares some of the basic premises of design thinking (Dunne & Martin, 2007), in which the ability to work with ill-defined problems by way of abductive reasoning is seen as one of the most important skills in the future and, therefore, of utmost importance for the educational system to consider developing. Rather than trying to find the ‘creative child or

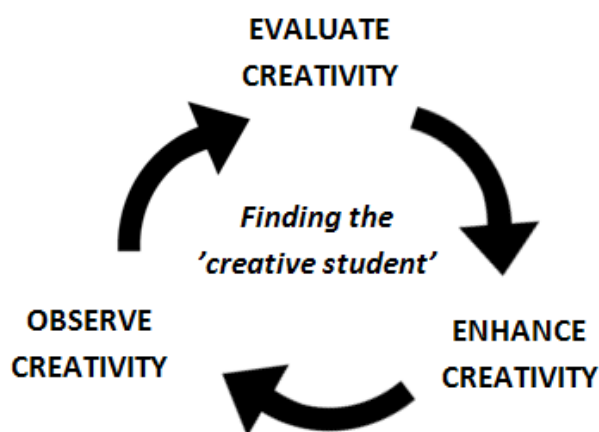


Figure 1. A framework for creativity assessment as intervention in educational settings

student' as a static one-moment-in-time process, the development of creative capabilities is considered here a dynamic, on-going process in which any form of assessment becomes an integral aspect of the learning process rather than a separate activity.

### **Towards the future of creativity assessment: Dynamic and formative testing**

We started this paper by outlining the importance of creativity and innovation in educational systems that strive to develop active and creative students, capable of taking initiatives and seeing them through (thus having strong entrepreneurial skills as well). However, as we have seen from a brief case of encountering educators during creative learning workshops, these efforts are constantly challenged by different features of testing, of the curriculum, and by the way some teachers tend to interpret new curricular standards. We then proceeded to a close analysis of how creativity is being assessed in psychology as it is primarily this professional groups teachers look to in search of advice on these issues, in general. And yet, divergent thinking tests, the 'golden standard' of creativity assessment, rarely live up to their promises. First of all, they tend to disconnect idea generation from idea implementation and focus largely on the latter which is a major problem considering the evidence that these skills are integrated in concrete innovation work. Second, there are many individual and cultural factors that are not taken into account by these tests, which make them too general to be useful in many concrete settings.

In this context, a new look at measurement, informed by cultural psychology and learning theory, was advocated for, one that considered the inter-relation between observing, assessing, and enhancing creativity in the school context. How can creativity tasks be used as intervention and not only for purposes of assessment? There is a strong line of thinking pointing towards this direction, again in psychology. It goes back to the scholarship of Lev Vygotsky (van der Veer & Valsiner, 1991; Cole, 1996), and is reflected in recent efforts made to formulate and apply 'dynamic assessment' (see Lidz, 1987; Tzuriel, 2001; Haywood & Lidz, 2006) and 'formative interventions' (Engeström, 2011). In essence, dynamic assessment involves adapting the tasks presented to children or students to their level, interest and needs, and both identifying and expanding their potential by

facilitating interaction with others. While this type of evaluation exists for intelligence testing, there are virtually no studies of dynamic creativity assessment which is not only a theoretical gap but one with very serious practical consequences<sup>1</sup>. Dynamic assessment promotes collaboration in working together on a creativity task and this is what students do most of the time in class. By not paying sufficient attention to these moments, or not structuring them in such ways that students get the most out of their activity (in line with the aim of enhancing creative expression) and teachers become capable of observing and assessing their work as it unfolds, we are missing valuable teaching and learning opportunities. In the end, it is the artificial separation between divergent thinking (ideation) and convergent thinking (evaluation) that we are reinforcing when detaching assessment from intervention. A more holistic way of looking at educational practices is required in order to transcend such divisions for the benefit of all those involved.

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### Notes

- 1 We are grateful to Todd Lubart for suggesting this new line of theory and investigation.