



INTRODUCTION

1. Is it really possible to measure creativity?

A first proposal for debate

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THERE IS NOTHING LIKE A DREAM TO CREATE A FUTURE.
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Introduction

This chapter summarises the main points considered at the conference 'Can creativity be measured?' organised by the Directorate-General for Education and Culture (Education and Culture DG) together with the Centre for Research on Lifelong Learning (CRELL) of the Directorate-General Joint Research Centre of the European Commission (JRC) that took place in Brussels on 28 and 29 May 2009. The conference was organised within the activities of the 2009 European Year of Creativity and Innovation. The Year aims to raise awareness of the importance of creativity and innovation for personal, social and economic development; to disseminate good practices; to stimulate education and research, and to promote policy debate on related issues. Within this framework, the conference was set up to stimulate debate around the scientific measurement of creativity. The conference had around 200 participants and almost 40 speakers and panellists.

The aim of the conference was to advance the understanding of different ways of measuring creativity and to assess the feasibility of measuring creativity in an international, comparative manner. The intended outcomes of the conference were twofold: firstly, a short-term objective was to provide a list of a limited number of indicators, at national or regional level, covering the various dimensions of creativity (derived from

existing statistical sources); secondly, in a more long-term perspective, the conference aimed to identify the available tools and necessary steps to be made to conduct a large-scale survey to measure individual creativity.

Towards a working definition of creativity

The conference purposefully did not provide a definition of creativity. Since the ultimate objective of the conference was to study the possibilities available for measuring creativity, providing a definition of the phenomena would have restricted the views and approaches. By trying to look at a plethora of approaches to creativity and extracting common elements in all of them, it should be possible to establish a preliminary, working definition of creativity that will permit to go forward and that will describe the essential elements of a measurement model. The approach is 'inductive' in the sense that it is expected that a definition will 'emerge' from the different approaches.

The focus here is on creativity as a human and social characteristic. It occurs in all the different areas of human activity, and across content domains, that is to say it is not restricted to arts but occurs in all domains of human activity. This is, thus, a universal, democratic understanding of creativity. It is universal because it maintains that there are some necessary characteristics in creativity common across all creative actions and democratic because it maintains that everyone has the potential to be creative.

The definition points towards an everyday or 'little c' creativity. The type of creativity that makes people adapt to the constantly changing environment, reformulate problems, and take risks to try new approaches to problems. The defining characteristics of originality and adequacy to the situation require a point of reference. Csikszentmihalyi (1996, 27) has shown that 'big C' creativity, 'the kind that changes some aspects of the culture, is never only in the mind of a person'. For him, creativity can be observed only in the 'interrelations of a system made up of three main parts': domain, field and person (ibid). The domain refers to the cultural system, which consists of a system of symbolic rules and procedures. The field includes all the gatekeepers of a given domain. The field determines what products are regarded as creative. Finally, the person is the actor in the system that actually uses the symbols in a giving domain and which ideas and products are chosen as innovative.

The application of Csikszentmihalyi's thesis to a working definition of 'little "c" creativity' is not straight forward. But it is clear that creativity, even the 'little "c"', requires a complex combination of factors to appear that relate to the field, the domain and the person. Originality and adequacy will depend on the reference taken (the person, the peers in a domain, the whole history of a field ...).

Can creativity be measured?

Aggregate and individual level approaches

Thus, the question 'Can creativity be measured?' purposefully general, is instrumental in looking for a common understanding of what creativity is, what components and aspects of it can be measured and how. This question constitutes a first step, and needs the political will and adequate infrastructure to be taken further.

In terms of creativity measurement, one can distinguish between two general and rather different approaches: psychological and aggregate-level approaches (see Villalba, 2008 for further explanation). While the psychological approach is based in the, more or less, traditional psychometric models interested in individual level characteristics, the aggregate approach comes from a different set of disciplines interested in creative aspects of society. This paper will briefly discuss the two approaches: at aggregate and individual levels. Before looking into how to measure creativity, it is necessary to touch upon the reasons on the relevance of measuring creativity for policy purposes

Why should creativity be measured?

At least since the relaunch of the Lisbon strategy in 2005, innovation has been one of the main pillars of cooperation in Europe. The Communication of March 2008 (European Commission, 2008a, 2) puts it simply: 'Europe needs to boost its capacity for creativity and innovation for both social and economic reasons.' The decision of the European Council in establishing 2009 as the European Year of Creativity and Innovation put the emphasis to the fore.

Innovation is defined by the Oslo manual as: 'The implementation of a new significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations' (OECD and Eurostat 2005, 146). As such, any innovation requires of some sort of creativity. There can be creativity without innovation, but innovation cannot appear if there is no creative generation at some point. In general terms, creativity is seen as a precondition to innovation. The first step into any innovation is a creative idea, even if the idea is to copy someone's idea into your organisation.

Another reason for the importance of creativity comes from education. It is usually argued that educational systems are not providing young people with the tools to adapt adequately to the knowledge-based economy. As Sir Ken Robinson (June, 2006) has pointed out, "We are educating children for jobs that do not exist yet, using

technologies that have not been invented yet, in order to solve problems that haven't even been identified yet." He maintains that creativity is as important in education as literacy and should be treated with the same status. As Sternberg (2006), Robinson expressed that creative potentials might be suppressed in children, because of society and educational systems that tend to encourage conformity.

Thus, educational systems have to change in order to be more proactive in the promotion of creativity. Education needs to accommodate to the new demands of a society that requires flexible workers, lifelong learners ready to adapt to a constantly changing environment. It is not only necessary to discover the talents of each individual and to get each individual to the maximum of his or her capacity, it is also necessary to give young people the adequate set of tools to exercise creativity.

In addition, R. Florida (2002a) has postulated that creativity is the new source of wealth. He has been instrumental in the promotion of creativity. For him, there is a paradigm shift in lifestyle from the old economy to a new economy driven by creative individuals. For him, economic growth is determined by the capacity of an area to attract talented individuals. "Places," he says, "create the ecosystem for creativity to be nurtured; such places are characterised by three Ts: Technology, Tolerance and Talent" (Florida, 2002a, 2002b, 2002c, 2004).

The importance of measuring comes from the necessity to provide adequate policies for the promotion of creativity for the reasons stated above. The challenge of measuring creativity adequately is at the core of being able to take adequate decisions and propose initiatives. It is not enough to put in place policies for the promotion of creativity, it is also necessary to monitor if the policies in place are or not being effective.

The following section will explore the measurement of creativity at an aggregate level. That is to say, the characteristics of society associated with creativity. Later on, the focus will be in measurement approaches that point out to individual level creativity.

How to measure creativity in society: measuring creativity at the aggregate level

The different initiatives that exist to measure creativity at the aggregate level are, indeed, not measuring creativity levels per se. They are measuring the contextual characteristics that could be associated with creativity, or the different aspects in society that can be regarded as the output of a creative process (such an innovation). The different sets of indicators, therefore, constitute pointers of aspects that can be related to creativity.

Different existing initiatives related to different measurements, such as innovation or entrepreneurship, have several indicators in common, and could be unified into a composite index on creativity. To find the most adequate set of indicators for creativity will require further analysis of the relationships between variables and a wide debate on the importance of each indicator for the relevant stakeholders.

One clear agreement in terms of pointers of creativity refers to innovation. Innovation is without doubt connected to creativity. Indicators on innovation can be regarded as pointers to assess the capacity of a region or a nation to deliver creative products. In this way, determinants associated with innovation (such as the European Innovation Scoreboard (EIS) enablers or firm activities) could be seen as contributors to the creative capacity of a place. The different indicators on innovation show the tendency of a place to produce valuable economic outcomes derived from its creative capacity. From EIS, mainly the 'throughputs', innovators and some of the indicators of economic effects could be regarded as those specifically pointing to the creative products (See Chapters 4 and 13).

This could be regarded as a set of indicators pointing to creative performance of a region. It refers to the indicators that are showing evidence of creative behaviour. At the moment, it is mainly possible to find indicators used in innovation indexes that pertain to creative products, processes or organisational innovations (see Chapters 3 and 4). In addition, entrepreneurship performance could be used as an extra pointer of the creative capacity of a region or a nation (see Chapter 9). Inclusion of measures on knowledge capital outcomes (See Chapter 5) and of cultural production (see Chapter 12) might provide also alternative, valuable measures. The Hong Kong creativity Index (see Chapter 6), for example, uses among others, the per capita production of newspapers, books, music and films. Other important creative outcomes that could be possible to grasp refer to the number of publications or the 'normalised citation impact' that have been used to measure quality of research activities in university (see Chapter 7). In addition, ideally, the set of indicators on products would also have aspects related to social innovation and innovation in the public sector. In these areas, however, there is a need to further develop an adequate set of indicators and methodologies to collect them.

The output indicators referred above are the consequence of a milieu that encourages and enables creativity. This environment that encourages creativity requires of tolerance (Florida, 2002a, 2002b), heterogeneity (see Chapter 11), having adequate cultural amenities (Chapter 12) and should provide a good array of leisure possibilities (see Chapter 14). In addition, technology plays a crucial role as a tool to improve creative performance (see Chapter 23). Relating specifically to science and technology indicators, the web-based hyperlinks between universities, and the share of doctoral

candidates with citizenship from another country, might provide useful measures of heterogeneity (see Chapter 7). The so-called creative industries, might play a crucial role, not only in producing creative outputs, but in acting as a catalysts for creativity in the economy, and hence, innovation, in a region or nation (see Chapter 13). The chapters referred above, provide different sets of interesting indicators to use in the development of indexes to capture the creative environment.

A different set of indicators would refer to the people and mainly to those who are participating in jobs that allows them to use their creative potential. Florida uses the creative class indicator (see, for example, Chapter 8) to capture the 'talent' of a region. Within the creative class, human resource in science and technology indicators could be included (see Chapter 7). Considering only the percentage of the population in the creative class, however, might be misleading and not adequate for cross-national comparisons, as Lorenz and Lundval have shown in Chapter 10. Measurements more specifically related to work organisation and tasks at work might prove more adequate to capture actual possibilities to perform creative activities at work.

In addition, in close connection to indicators on people are indicators referring to the level of education of a population. These measures, traditionally associated with human capital, show the level of skills of the population, but would have to be developed further if we want to really assess creative capacity. It is, thus, interesting to explore further the role of education in creativity.

The role of education

Education plays a crucial role in relation to creativity. Firstly, education gives the opportunity to discover and enhance people's talents. It should also provide the basis to place the seed in individuals that will encourage them to be more creative, take risk and be lifelong learners, constantly updating their knowledge and skills. Education plays also an important role in the update and maintenance of adequate levels of skills and knowledge in the workforce.

Indicators that can point to the enhancing capacity of education and training systems towards creativity, however, might not be easy to find. So far, the indicators referred to above on 'people', such as the creative class, only provide complementary information to the traditional human capital indicators (e.g. educational attainment of the population). At regional and national levels, it is difficult to find indicators that say more about the creative capacity of a country than the educational attainment of a population. A focus on artistic education might be a possible approach (see Chapters 4 and 12) but this will provide only a partial view of creativity associated with the arts.

The Program for International Student Assessment (PISA) of the OECD could also provide some information on the creative capacity of 14-year olds. At high levels of performance (levels 5 or 6 in PISA), the test items usually require sophisticated ways of providing an adequate answer to complex problems. Some of these items might require high levels of creativity. However, this sort of indicators will provide similar results that PISA, providing only the amount of high performing individuals in maths, science and literacy, but it would not provide an account of the most highly creative (Villalba, 2008). Further, a measure of this type might provide an elitist view of creativity, where only few can be seen as creative.

Despite these difficulties, it would be beneficial to search for information in the educational systems that will tell us how much creativity is being enhanced. Preliminary analysis (as shown in Chapter 4) shows that creative education will enhance creative performance. However, as the authors point out: 'For truly understanding the linkages between creativity, design and innovation new data are needed to construct more precise and direct indicators'. Without a survey specifically designed to capture aspects associated with the enhancement of creativity, such as the possibility of students to take risks, entrepreneurial education or teacher's attitudes towards creativity, it would be difficult to achieve adequate indicators.

Measuring creativity at the individual level

The previous sections have shown different sets of possible indicators for the creation of a composite indicator that would address aspects associated with creativity. However, these are only features of society that are associated with creativity. We would need actual evidence on the creativity levels in the population to know if, in fact, these aspects that seem to be incrementing people's creative capacity are actually doing so. This is, of course, a very complicated challenge and there might be several reasons not to pursue such a project. But, specifically in education, such a project might be worthwhile. Assessment of creativity in education might be beneficial in providing an adequate incentive to the system to actually promote creativity, and to be able to monitor progress.

Creativity needs to be measured taking into account its complexity and multidimensionality. Certain indicators at the aggregate level presented above can be seen as proxies of domain and field aspects. For example, cultures that are more heterogeneous and that permit the creative actor to be exposed to a major number of ideas will more likely foster creativity.

One lesson to be learned from the system theory of creativity is that a creative product appears always associated with a specific domain and field. This does not

imply that the creative process or the creative person cannot have some universal characteristics, but that the manifestation of it is necessarily associated with a field and a domain; that is to say, its manifestation is in a specific time, in a specific field. It is needed, thus, to identify certain aspects of the person and the process that are universal and common to all creative actions or as Runco puts it in this volume (see Chapter 25), to determine a parsimonious definition of creativity.

First, certain measures would necessary refer to the creative person. That is to say, what personality traits are necessary in a universal definition of creativity? As in the case of a composite indicator, there is a need to build consensus around these characteristics. Rosa Aurora Chavez-Eakle (see Chapter 16) shows an overview of different methods to assess personality traits on creativity. Research seems to show that creative personality encompasses: autonomy, flexibility, preference for complexity, openness to experience, sensitivity, playfulness, tolerance of ambiguity, risk-taking and risk tolerance, intrinsic motivation, self-efficacy and wide interest and curiosity (see also Runco 2007). To what extent all these characteristics are necessary is a matter of debate and further research is probably needed, but there is enough information available to build consensus on some specific characteristics as a starting point for measuring.

Secondly, since creativity is a capacity to produce, it would be necessary to look at the creative process. Some necessary characteristics of the process seem to be an adequate problem identification and specification, together with the capacity to recognise what ideas are worth. In addition, certain styles of thinking are most likely to be creative: tolerance to ambiguity and openness are also important in the creative process. Perez Alonso-Geta (see Chapter 19) concludes from its meta-analysis of creative literature that the creative process involves: divergent thinking, analytical skills and critical thinking.

Thirdly, the most crucial characteristic of any definition of creativity presented above is that it involves something original and adequate. That something is original involves that it is different from the norm, it can be original in relation to the person, the peer group, the domain, etc. (see e.g. NACCCE, 1999). The problem of determining the originality could be dealt with by fixing the reference level of what constitutes 'new' or 'original'. Does it have to be considered new-to-the-person, to-the-field, to-the-domain? In a large, international survey, because of the large number of respondents, it would be possible to establish measures of 'originality' in some of the responses to items, since one can get an estimate of the average responses. Techniques developed in developments of divergent thinking (see Runco, 2009). In the case of adequacy, the other crucial aspect of creativity, it would be necessary to have a reference to the problems presented when measuring creativity, that is to say, the items constructed through consensus.

This approach to creativity measurement, compartmentalising its different aspects, is in line with the approaches marked by Sternberg and Lubart (1999) as 'confluence approaches'. The main idea consists in being able to use multiple views on creativity together where different components must converge for creativity to occur. What a measurement model would do is, in fact, to search for what components are strictly necessary and which are not. In this sense, Runco's (see Chapter 25) proposal of a parsimonious approach to creativity might be valuable. Runco proposes a hierarchical framework for the study of creativity dividing the different aspects of creativity into creative potential and creative performance. The former refers to the person, process and press (pressure of the environment), while the latter to the products and persuasion. For him, creative potential would be much more worthy to study, since it would provide the highest returns on investment.

Lubart (May, 2009) showed at the conference a multivariate approach to creativity. He considers cognitive, personal/motivational, affective and environmental aspects to study creativity in organisations. These different aspects constitute a profile that can be contrasted to the tasks (creative tasks) that the individual has to pursue. In this sense, it is not only necessary to create an environment that promotes creativity and that people become more creative, it is also important that the task matches the creative profile of the individual, otherwise, there will not be a creative output.

Csikszentmihalyi's (see Chapter 26) concerns on the theoretical bases of a measure for creativity are also noteworthy in this introduction. It is necessary to decide if creativity is an individual characteristic or it is necessarily the 'post hoc social attribution to new ideas and objects that find favour in the marketplace of ideas or of commodities'. Assuming the latter, it would require measurement models that would include both, individual and aggregate level measurements. That is to say, we would have to assess individuals in specific aspects of creativity and the environment in how inductive to creativity it is.

Steps towards a large-scale survey

The previous sections have shown that there are ways for measuring specific aspects of creativity, both at individual and aggregate levels. Now, it is important to ask how would it be possible to assess creativity in a large, cross-national survey? What would be the necessary steps? The complexity of creativity certainly makes it an enormous challenge, and it would be difficult to predict the actual outcome of such project. However, there are certain reasons for optimism in pursuing such a challenge measurement task.

First, the field shows a certain degree of convergence towards a systemic approach to creativity, where different aspects must coexist for creativity to occur. This

is important because, as Csikzentmihalyi points out (see Chapter 26), it will be a task of agreeing in a specific approach to creativity and what aspects are essential and necessary.

In this way, the very first step for creating a measurement of creativity is in agreeing in its definition. A definition that involves the aspects presented above would have to be discussed in depth by the relevant stakeholders that would be interested in using the measure for decision-making.

The next step would be the definition of a framework. A framework will determine what is and what is not considered creative. In this way, it might be more practical to focus at the beginning on one specific domain to launch a survey on creativity, or to focus on a specific aspect of it. To measure universal creativity might require too long a process of determining the specific aspects that are actually necessary. But this might be achievable in a given field and domain. The main challenge, from a confluent approach point of view, would be that there are several aspects that have to be measured at the same time, and this might be extremely costly. It might be adequate to focus in a specific aspect of creativity, such as the creative potential, or the creative personality traits. Several contributions in this book show specific examples of how creativity has been measured in specific contexts (see Chapters 17, 20, 21). They might provide preliminary insights in the ways to go further.

With a reference framework well defined and built on consensus, it should be possible to create items to measure the agree characteristics of creativity. The instrument would have to be tested and adapted to the national contexts in the European Union. The tool would have to be pretested as a pilot study in as many different countries as possible. If the results of these pilot tests were satisfactory and the tool is good enough, it would be possible to start a full-scale process that would provide a picture of creative levels in society, or in the target population.

A project of these characteristics would require strong leadership and a clear vision and structure in terms of resources. The potential of such a survey is enormous, since it would provide a picture of one of the most important aspects of human nature. If we can understand how to nurture it and improve it, using a value-loaded reference framework, it is clear that it will lead to positive outcomes for society in general.

The need of debate and consensus

It is important to insist on the importance of a wide debate about the framework, both for aggregate and individual level measures. As stipulated in the handbook of composite indicators (Nardo et al., 2008), the first step in the creation of a complex measure is always determining what is to be measured and create consensus on how.

The different stakeholders interested in using the measure have to be active in determining its most important aspects. In addition, the measurements derived from this framework, would have to be contrasted with other approaches referring mainly to innovation, and demonstrate a value added in terms of allowing for more informed political actions.

One aspect that would most likely benefit from a composite indicator on 'creativity' would be social innovation. Social innovation is not usually considered in traditional innovation indexes. It is, however, of crucial importance, especially for policy-makers. An index on creativity would be necessarily closer to social innovation, since it would have to widen the scope of creative products, or innovations, to include outputs that are not associated with market and production. In addition, an index related to creativity might provide a way to research into innovation in the public sector, and specifically in education.

In terms of creativity measurement at the individual level, the study of the creativity of students will surely provide important insights in how to improve the quality of education and training systems. It would help to adapt the education and training systems to provide the adequate skills for the 21st century.

This book aims at being a concrete point of departure for the debate.

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