

Creativity in 21st-century education

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Abstract The 2006 UNESCO conference *Building Creative Competencies for the 21st Century* had international participants and a global reach. The Director-General's proclamation that "Creativity is our hope" captured the essence of the proceedings and participants saw the focus on creativity as offering solutions to global problems. However, educators tend not to understand creativity appropriately or to value it strongly—and they tend to see it only through Western eyes. Only by considering other cultural views will we gain insights that can inform educational practice in the 21st-century global community. This article discusses some recent studies of creativity, reflecting the growing global interest in it and comparing that interest with established Western perspectives. A more comprehensive, international perspective might support a press for fostering creative thinking in schools and inform practices in our increasingly interconnected world; however, teacher training must introduce teachers to the diversity of views and the expectations of local people.

Keywords Creativity · Curriculum · Creative thinking and learning · 21st-century education · Skills · Competencies

Amy Azzam (2009) suggests that creativity has been "maligned, neglected, and misunderstood but is finally coming into its own" (p. 22). In a discussion with her, Sir Ken Robinson, chair of the UK government's National Advisory Committee on Creative and Cultural Education (NACCCE 1999), identifies creativity as *the* crucial 21st-century skill needed to solve pressing contemporary problems.

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Creativity is hardly new. At least 40,000 years ago, creative activity flourished as people, with the help of language, used the creative process in their art and technology, making it “one of the most striking features of the human species” (Carruthers 2002, p. 226). The evolution of humans through the various ages of stone, bronze and iron to the modern technological digital age rests on creative thinking and problem solving. These are highly valued processes, largely for material reasons (Beghetto 2007). At the personal level, creativity offers a kind of empowerment which may help people find satisfaction and lead fulfilling lives (Kind and Kind 2007; Newton 2014; Shaw 1989). Most of us can respond to needs with some degree of imagination and creativity (Boden 2004).

Creativity is complex, vague and elusive, evading definition and categorization (Burnard 2006; Pedersen and Burton 2009; Rowlands 2011). Yet, researchers have generated a plentiful supply of descriptions of creative thinking in different contexts. For example, Carruthers (2002) suggested that “anyone who is imagining how things could be other than they are will be thinking creatively” (p. 226). Compton (2007) identifies six components as essential for creativity: enquiry, evaluation, ideation, imagination, innovation and problem solving. Lin (2010) notes the use of imagination, independent thinking and risk taking. However, Runco (2008) argues persuasively that focusing on performance misleads us, and suggests that educators should define creativity literally as “thinking or problem solving that involves the construction of new meaning” (p. 96). For him, such construction is a creative process since understanding involves the construction of new ideas and explanations. A more consensual view is provided by NACCCE (1999): creativity is “imaginative activity fashioned so as to produce outcomes that are original and of value” (p. 29).

The problem is that cultures vary in the priority they place on novelty or originality, as opposed to usefulness or appropriateness. In the West, people look for novelty *and* appropriateness in solving problems, so they especially value novelty; in the East, they especially value appropriateness (Morris and Leung 2010). In Eastern contexts, Lin (2011) discusses the emphasis on product-oriented creativity, while Kimbell (2000) suggests that in the West the focus is on process-oriented creativity. Thus, we need to be open to other cultural perspectives when thinking about creativity and educational practice.

The press for creativity: Economic, cultural and personal perspectives

Craft (2006) describes how in the 1990s there was increasing interest from policy makers worldwide that shifted creativity as a topic from the periphery to the core of debate. Numerous research studies, official reports, government publications and reviews of policies and practices summarize thinking about creativity and promote it (Ferrari, Cachia, and Punie 2009; Loveless 2002; NACCCE 1999). Creativity is now a concern on the political, social and educational agendas of many countries. For example, in Europe and North America, “identity, society and culture [require] new types of teaching and learning... focused on fostering cultural identity, creativity and social cohesion” (UNESCO 2006, pp. 29, 39). In Asian and Pacific Rim countries, one of the challenges is the “need for imagination, creativity and collaboration as societies become more knowledge-based” (UNESCO 2006, p. 13).

Economic and cultural perspectives

The world population has more than doubled in the past 50 years, with no sign that the rate will slow down (Bandarin 2011). Rapid advances in technologies have changed both how

people work and their values and aspirations. These changes generate problems which will need “every ounce of ingenuity, imagination and creativity” (Ken Robinson, quoted in Azzam 2009, p. 22). Increasing pressures on limited world resources generate economic challenges, and this has stimulated interest in creativity worldwide (Shaheen 2010). The intellectual products of creativity are seen as a source of wealth and as a panacea for financial ills (Banaji 2008). Many countries now see the creative capacity of their workforce as critical for their economies, and they are encouraging its development through education. Among the writers describing this trend are Bell and Jayne (2010) in the United Kingdom; Faggian, Partridge, and Malecki (2010) in the United States; Ho (2009) in Singapore; McWilliam and Haukka (2008) in Australia; Oral (2006) in Turkey; and Phan, Zhou, and Abrahamson (2010) in China. Burnard (2006) describes what has resulted:

...an unprecedented resurgence of activity in the field of creativity in education as an area of scholarship, as a key element of the shifting policy context, and [as an] official agenda in relation to efforts to improve our schools. The creativity agenda is recognized in many countries—not as a transient fad, but as having an explicit role in the economy. (p. 313)

This instrumentalist view, with a political focus on the economy, is also stressed by Beghetto (2007), who argues that creativity is “the ultimate resource and an essential for addressing complex individual and societal issues” (p. 1).

Past studies of creativity were mainly Western in origin, coming particularly from the United States. More recently, researchers have taken a wider perspective. The notion that creativity is value-laden and culture-specific has been discussed by a number of researchers (Chiu and Kwan, 2010; Craft 2003; Erez and Nouri 2010). Having examined the effect of culture on national innovation and prosperity in 63 countries worldwide, Williams and McGuire (2010) noted that culture has a significant influence on economic creativity. Kharkhurin and Motelleebi (2005) compared the impact of culture on the creative potential of students from the United States, Russia and Iran. Using measures of how students used divergent thinking to make judgements, they found that while originality and innovation were valued as creative behaviours in the West, this was less the case in the East. They argue, however, that studies showing superior creative performance in Western students could be attributed to the differences in how the concept of creativity is perceived in East and West and to the fact that the tests, developed in the West, are culturally biased in favour of Western values and beliefs.

Recent work by Niu and Kaufman (2013) generates similar conclusions. They compared beliefs about creativity in Chinese and North American (US) cultures, describing these as the two most-studied cultural groups in the field of creativity. They looked particularly at how creativity is conceived, evaluated, and nurtured. They note the stereotype that Chinese cultures are less creative than American cultures but challenge this by arguing that the measurements and theories were developed in Western countries (mainly the United States) and are, therefore, culturally biased.

Fleith (2011) describes the press for creativity in South America (Brazil) as a socio-culturally and contextually embedded phenomenon, with the effects of cultural factors paralleling those manifested worldwide. In India, the potential of creativity to contribute to economic growth is increasingly being recognised, although schools still favour rote learning (M. Singh and V.J. Singh 2012). Yet, this occurs in a thriving culture of *jugaad*—the frugal, creative improvisation of solutions to practical problems (R. Singh 2012). For example, Radjou, Prabhu, and Ahuja (2012) describe an affordable refrigerator of fired clay, cooled by evaporating water, and invented for the poor living in hot climates.

Jugaad's six principles (find opportunities in difficult situations; do more with less; be flexible; keep things simple; include society's margins; use intuition) form a mind-set which has attracted attention elsewhere as an approach to the business of innovation (Bobel 2012; Radjou et al. 2012). Nevertheless, some Indian politicians are ambivalent about *jugaad*, doubting that its creativity can have economic value (Sheikh 2012). At the personal level, however, it offers self-reliance, aids survival and is finding favour in other parts of the world.

Social and personal perspectives

Collective and individual perspectives are both important. Robinson (in Azzam 2009) highlights the social dimension of creativity and the need for educators to take this into account when addressing the challenges of the 21st century. Schools are social experiences. We all draw upon the inherited cultures into which we were born and the social contexts in which we live. Some societies which value high levels of personal freedom see fostering creative thinking as a means of propagating their ideologies. This is particularly significant for educators, as their focus is on the value of creativity in supporting and fostering the well-being of individuals. Creativity can help people develop their problem-solving and other thinking skills, enrich their lives and engender a capacity to cope, develop and grow in response to change in their own society.

Fostering creativity: The education perspective

When thinking about creativity in classrooms, we must distinguish between teaching creatively and teaching for creativity (NACCCE 1999). The first term points to a teacher's ability to construct engaging lessons that interest and motivate the learners. While this is important, there is no guarantee that, amongst the many positive outcomes of such lessons, the students' creative thinking ability is in any way exercised. With teaching for creativity, the focus shifts to thinking about how to foster the learners' own creative thinking. Jeffrey and Craft (2004) suggest that the term "creative learning" is more appropriate than "teaching for creativity", since the former is wider than the latter, allowing for learning which necessarily employs creative thinking.

According to Walberg (1988), it is by developing students' creativity during their school years that teachers lay down the building blocks of creative capital. Yet, they seem to encounter problems in achieving this, resulting from widely held misconceptions about creativity (Boden 1994).

Creativity in all students

One problem is a popular view that creativity is the exclusive preserve of special people. Early research focused on the notion that only people with special abilities, gifts or talents could be creative, and researchers sought links between creativity and intelligence. In the case of creative products that change the world, this might be so—something which researchers like Gardner (1993) and Richards (1993) describe as "big C" creativity, which has historic or global consequences. However, everyone has the potential to be creative in the sense of creating something new to themselves and solving the problems of everyday life (Boden 2004; D.P. Newton 2012b; Runco 2008). This democratic, psychological, or "little c" creativity generates something new for the individual. The difference lies in

where the originality is valued: at the personal level or the historical? When an individual constructs an understanding for the first time or develops new ways of approaching a problem, she or he is being creative, usually in the sense of “little c” creativity. Runco (2008) argues that “[v]irtually every individual has the mental capacity to construct personal interpretations.... [C]reativity is something we can find in every child, not just the gifted or highly intelligent” (p. 96).

Glăveanu (2011) addresses the question of whether young children can be creative from four different perspectives:

- Product: the outcomes of creativity (e.g., paintings in art, inventions in technology);
- Process: the internal and external processes used to create the product (e.g., comprehension, exploration of ideas);
- Person: the extent to which creativity is personal (e.g., daydreaming, exploring ideas);
- Press: social or cultural influences (e.g., interaction with others, sharing ideas).

He concludes that young students are active, interactive and creative individuals whose creativity can be fostered, and she emphasises the importance of social contexts to stimulate goal-directed creative thinking.

Nor is there evidence of racial or gender differences in the potential to be creative (Baer and Kaufman 2008; Kaufman, Baer, Agars, and Loomis 2010). However, as Bowkett (2007) points out, although most of us have this mental capacity to be creative, many never realize it. Often this is because teachers have difficulty recognizing creativity and they miss classroom opportunities, what Chien and Hui (2010) call the “unexpected micro-moments of creativity”. A study by Kim (2008) in the United States showed that the worrying underachievement of gifted high school students was linked to their inherent yet unrecognised creativity, resulting in large numbers dropping out of school at an early stage.

More able learners are often identified by their ability to use higher-level thinking skills. These skills have usually been described using Bloom’s (1956) terms for higher levels—analysis, synthesis and evaluation—which are now replaced by three terms from Anderson and Krathwohl (2001): analyse, evaluate and create. But surely these kinds of thinking are not the preserve only of gifted or more able students? All learners can be encouraged to practise them. Teachers, therefore, need to provide opportunities for all students to develop and use creative thinking (e.g., adapting ideas, suggesting alternatives, using analogies), problem solving (e.g., raising questions, searching for solutions, generating ideas), and critical thinking (e.g., weighing evidence, justifying choices, challenging assumptions).

The need to think about both cognitive and affective dimensions when fostering creativity was considered by Eckhoff and Urbach (2008). Based on their work with very young children, they discuss the effect of informal and formal learning environments on the children’s creative thinking endeavours. They argue that while teachers are aware of the need to construct classroom environments and practices that reflect children’s physical, intellectual, social and emotional development needs, they are less aware of how to consider these when nurturing and supporting students’ creative thinking. The effect of moods and emotions on the creative process is an area that has tended to be neglected until relatively recently (D.P. Newton 2013). Feeling moderately happy signals that a situation is free from threat and it is safe to take risks without a concern for unwelcome consequences, which broadens thinking (Fredrickson 2004; Fredrickson and Branigan 2005). Feeling anxious, however, can make students cautious, curtail their wide-ranging thought and inhibit their generating of ideas. And tensions can arise during a task as the thinking needs move from idea generation to critical evaluation. Moods which foster one kind of thought are not always right for the other (D.P. Newton 2014).

Creativity in all subjects of the curriculum

A second problem is the tendency to associate creativity and the arts. Historically, creativity has regularly been discussed in the context of art, music and poetry, and described by referring to them. The archetypical creative person is an artist or dramatist or musician. When UNESCO launched its Creative Cities Network in 2004, it categorised creativity under seven headings: Literature; Film and Cinema; Music; Crafts and Folk Art; Design; Media Arts; and Gastronomy (Bandarin 2011). Just as with the Creative Partnerships (2004) initiative in the United Kingdom that encouraged artists (broadly defined) to collaborate with educational establishments to develop students' artistic creativity, the emphasis on the arts in such initiatives reinforces existing misconceptions that other knowledge domains do not involve or encourage creative thinking. Working in universities, McWilliam and Dawson (2008) point to the need to focus not only on the creative arts but also on creativity in the sciences and other disciplines.

Creativity is polymorphic: its form depends on the discipline and context, although these forms have some common attributes. Boden (1994) maintains that "Creativity surrounds us on all sides, from composers to chemists, cartoonists to choreographers" (p. 519). The NACCCE (1999) report argues (p. 76) for a balance between science and technology and the arts and humanities, a proposal reiterated by Robinson (in Azzam 2009). He describes creativity as a function of everything we do in schools, so fostering creativity is about the whole curriculum, not just part of it. Its attributes in different curricular areas have been explored (L.D. Newton 2012a, 2012b, 2012c). This situation leads to a further problem: teachers have a vital role in fostering creativity in particular subject areas, but if they are insecure in their own skills, knowledge and understanding of the subjects they teach and not clear about what counts as creative learning in that subject (Newton and Newton 2009; Newton and Newton 2010), they are likely to miss opportunities to promote creative thinking.

While teachers cannot order individuals to be creative, they can stimulate students' creative thinking. Fryer (1996) proposed teaching creative thinking skills by providing opportunities for learners to become problem solvers. Encouraging them to solve problems for themselves, rather than giving them the answers, fosters creative thought. Teachers can provide an environment in which they can encourage, nurture, support and value creativity, an environment that encourages students to think differently, explore alternative possibilities, use imagination, experiment, problem-solve, explain, be innovative and take risks, but at the same time feel secure. Such environments foster creativity, regardless of age, ability or subject.

Creativity in crisis?

Kimbell (2000) reviewed the literature on creativity in education from the 1960s to the 1990s and described how, at the start of the 21st century, creativity in the UK curriculum was in a state of deep crisis. Over a decade later, little seems to have changed (Newton and Newton 2010). Political rhetoric and classroom reality are very different. Nor is the problem restricted to Western contexts. In Asia, Chien and Hui (2010), Hui and Yuen (2010), and Lin (2011) identify a lack of consistent rhetoric and practice in fostering creativity. This failure to live up to one's rhetoric is a problem worldwide.

One reason for this problem is the pressure on teachers. Some education systems are dominated by a performance-oriented culture which, according to Craft (2010), generates real tensions and dilemmas for teachers. In England, teachers are constrained by

government-controlled curricula tied into centrally managed assessment mechanisms. Test results generate school rankings, and inspection regimes lead to performance management and target setting. Such pressures are not unique to teachers in England. Countries in Europe and further afield have prescribed curricula (e.g., France and New Zealand) and the United States has developed a core knowledge curriculum, encouraged in all states. Among the consequences so far are a press to raise standards in literacy, more testing of students and making teachers more accountable to their managers (school boards and senior staff) and their customers (students and their parents). Many teachers are unwilling to risk deviating from the expected, since it is possible to meet expectations without making the effort to exercise the students' creativity.

Troman, Jeffrey, and Raggl (2007) examined cultures with mechanisms and systems that require teachers to perform to expectations and hold them accountable for outcomes. They found that such cultures lead teachers to favour approaches that support rote learning, memorization and comprehension over those that foster creative and critical thinking and problem solving. Research by Besançon and Lubart (2008) in France noted that teachers affected by pressures of the kind described above often feel compelled to resort to traditional teaching methods and avoid the classroom situations that encourage creative thinking and problem solving.

Comparing the United Kingdom and Australia, Burnard and White (2008) see a real conflict between the demands of politicians and governments that teachers teach for high test scores and at the same time teach for creativity. Freedom and control generate insurmountable tensions and are antagonistic to the development of creative learning communities. Burnard and White describe situations in which teachers were unsuccessful and give a variety of reasons such as lack of time, poor student performance, tightly controlled curricula and lack of resources. They also identify discrepancies that must be addressed: between teachers fostering creativity and knowledge acquisition, between creativity culture and Chinese culture, and between creativity reformers and traditionalists. Cheng (2010) noted similar tensions and dilemmas in Asian efforts to introduce creative thinking into the curriculum.

Teacher perceptions of students' creativity

A starting point might be ensuring that all teachers, regardless of where they are in the world and what and whom they teach, understand what counts as creativity in different contexts. Studies of pre-service and experienced teachers' conceptions of creativity have generally shown that they see fostering creativity as worthwhile. Nevertheless, teachers worldwide tend to see it as being associated more with the arts than the sciences. Both trainee and experienced teachers lack confidence when thinking about creativity, confuse it with the reproduction of objects and ideas, have little confidence in their ability to assess it and feel a need for training in fostering it. Among the researchers describing such findings are Kamylyis, Berki, and Saarilouma (2009) in Greece; Newton and Newton (2009, 2010) in the United Kingdom; and Chien and Hui (2010) and Hui and Yuen (2010) in China. In Shanghai, Hong Kong and Taiwan, Chien and Hui (2010) note that preschool teachers, whom they see as crucial in fostering creative development, highlighted the importance of what they describe as ecological factors: parenting style, financial status, curriculum approaches, teaching methods, innate abilities and experience. From their research with Chinese students in different countries, Hui and Yuen (2010) note that educators believe creativity is beneficial to learning and recognise that it can be developed across various domains of knowledge, but are challenged by how to foster it.

Some principles put into practice

Lin (2011) argues that research has placed insufficient emphasis on the supportive ethos for nurturing creativity and suggests that this neglect contributes to difficulties in fostering creativity. If we want teachers to foster creativity routinely in their classrooms they will need not only to know what creativity means in different contexts but also how to foster it (L.D. Newton 2012a, 2012b, 2012c). Teachers need to stand back and create time and space, according to Cremin, Burnard, and Craft (2006). By doing so, they give students the opportunity to daydream, play, imagine, experiment, take risks and problem-solve. In addition, social interaction becomes a possible stimulant to creativity. In a study in Hong Kong, Cheng (2010) looked at how teachers of young children were attempting to incorporate creativity into their primary science classrooms. He found the approach mainly consisted of playful learning activities and noted that this produced improvements in students' attitudes, behaviours and abilities, a better understanding of science concepts and a more positive attitude towards learning science. However, Cheng also found that students were still weak in other higher-level attributes of creative thinking (such as meta-cognition, risk-taking and innovative thinking), perhaps reflecting cultural perceptions and values in some Eastern cultures.

In the United States, Maker, Sonmi, and Muammar (2008) describe the DISCOVER project, a cross-curricular approach which uses problem solving to support creativity. They provide problems with varying degrees of structure for learners in different school grades. Observing the pupils at work, they noted the lessons had a number of characteristics which seemed to encourage creative thinking and problem solving.

- Students had freedom of choice.
- They set their own goals and decided how to meet them.
- They had opportunities to openly discuss possibilities.
- They experienced the challenge of creating something.
- They had the opportunity to work alone or with peers.
- And they helped to define expectations of the outcome.

Throughout, teachers supported the creative thinking processes with probing questions, encouraging justification and explanation. When the students had completed their projects, they presented them to the class, interacting with each other. Although the approach is applied in elementary schools, it could also be used with older students.

Contexts and tasks are important elements in thinking about creativity. Erez and Nouri (2010), working in Israel but reviewing research from around the world, focused on what they describe as the two dimensions of creativity (novelty and usefulness) and the nature of the tasks used (tight or loose) for generating creative thinking; they concluded that context was the crucial component for success. However, Kimbell (2000) would disagree with this. Although he conducted his research in the context of design and technology, he suggests that the processes underpinning creativity can be translated into any classroom context. Students are engaged in some creative task (whether self-generated or generated by the teacher), and need support from someone they value (the teacher). The teacher then supports them through feedback in a learning environment that has engendered their trust so they feel confident and can take cognitive and emotional risks.

Haddon and Lytton (1968), in a study of preschools, discuss what they call the "school effect". They explored the effect of formal as opposed to informal contexts on convergent and divergent thinking (although, as Runco (2008) notes, divergent thinking is not the same as creative thinking). Informal contexts, with open tasks and freedom, resulted in

more divergent thinking. In the context of design work, Pedersen and Burton (2009) analysed the concept of creativity to determine its conceptual components. They offer the notion of creativity antecedents: What do students need to know, understand and be able to do before they can be asked to engage in a creative enterprise? They identify three elements: relevant prior knowledge, relevant prior experience and a readiness for new ideas. "Helping students learn to generate ideas is important, but equally important is preparing them to recognize ideas and use ideas from a variety of sources" (2009, p. 29).

At the very least, the features that emerge from such research include opportunities to play (encouraging curiosity and risk taking) and use imagination (to generate ideas and possibility thinking), both in a positive and supportive context. However, societal and cultural norms and expectations may inhibit these activities.

Much of the work on creativity in schools has been in the context of preschools and primary/elementary schools. Omenyi, Ngozi, and Odimegwu (2009) carried out a study of creativity in secondary schools in Nigeria where government perceptions of creativity as the driver for innovation and advancement in society lie behind a push for institutions at all levels to foster students' creative abilities. Their research shows that the secondary teachers, like those in elementary schools, were finding this goal a challenge. Providing experiences in which students can use their imaginations, play with and develop ideas, and reflect on the processes and outcomes is necessary but not always easy.

Recognizing creativity

Some deny that it is possible to assess creativity, although Treffinger (2009) dismisses this view as a myth. Others argue that assessing it threatens the exploratory and risk-taking nature of the creative process itself. However, teachers still need to recognise and evaluate their students' creativity in order to help them improve or, at least, make the most of their creative abilities. In some situations, teachers may also be required to make summative judgements of their students' work (Cowdroy and Williams 2007).

Seeking to identify general creative traits and tendencies, psychologists have devised tests for this purpose (Torrance 1966; Urban 2004), often measuring divergent thinking. Runco (2008) points out that measures of divergent thinking are not measures of creativity, and tests of general creative traits, if they indicate anything at all (Pffifer 2012), have little to say about the variability of students' creativity in diverse classroom contexts (Silvia et al. 2008). Nevertheless, some educators have attempted to adapt these to specific contexts (e.g., Haylock 1987, in mathematics) although their relevance in the classroom is not always clear. In the confusion, teachers feel a need for a simple and easy way to assess students' creativity (Hui and Yuen 2010; Wu and Albanese 2010). Generally, teachers are advised to consider what creativity means in particular contexts and judge how well students measure up to it, using diverse sources of evidence. For instance, a teacher might evaluate a student's product, performance or accomplishment, observe the processes which generated it and ask the student to comment on the product and how he or she arrived at it (D.P. Newton 2012a).

Thanks largely to the work of Teresa Amabile (1983, 1996), this approach has the potential for wide application in the classroom where two or more teachers can collaborate in their judgments of students' work. The teachers' expertise, however, must extend over both the subject and the kinds of creative product typical for the students concerned (D.P. Newton 2010). The approach rests on a shared, if implicit, understanding of creativity and of the aspects of it believed to be of particular value (Craft 2002; Hunsaker and Callahan 1995). In the absence of this understanding, teachers' evaluations reflect the diversity of

their conceptions (Eason, Giannangelo, and Franceshini 2009). Furthermore, students' performance on just one task may not provide conclusive evidence of their creative ability (Baer and McKool 2009). Training which addresses such matters and highlights components of creativity, like novelty and appropriateness (Besemer and O'Quin 1987; Pfiffer 2012), can improve a teacher's ability to recognize creativity in a particular subject (D.P. Newton 2010).

Other sources of information are the students' own thoughts about their endeavors to be creative (Silvia, Wigert, Reitner-Palmon, and Kaufman 2011). Some more or less observable behaviour, or self-report of it, may also correlate with ongoing, successful creative processes. For instance, a feeling of "flow"—an engrossed, productive engagement with a task, without self-consciousness—has been found to indicate engagement in productive thought and action (Byrne, MacDonald, and Carlton 2003; Csikszentmihalyi 1996). Such sources of information, however, seem more open to teachers of older or more articulate students. The sum of such information, accumulated over time, can suggest a student's level of subject-specific creativity. Treffinger, Young, Selby, and Shepardson (2002, p. 49) recommend a scale for creativity; its descriptors range from Not Yet Evident, through Emerging and Expressing, to Excelling. This scale can be applied to the components of creativity that are seen as important on a specific occasion, and recognises the uncertainties of assessment. This is not to say, however, that such an approach guarantees agreement in assessment everywhere. For instance, Paletz and Peng (2008) found that while novelty was valued equally in Japan and the United States, appropriateness seemed to be more highly valued in Japan. In addition, in the West, education systems have a culture of measurable outcomes: "If you can't count it, it doesn't count" (see Robinson, in Azzam 2009, p. 23). This is likely to be at variance with such an approach.

Conclusions

We had three goals for this article. We aimed, first, to explore current literature that shows creativity being considered from different cultural perspectives; second, to compare the messages from this research with existing established views, many of them Western in origin; and, finally, to consider the implications for fostering creativity in curricula of schools worldwide.

It is clear that a wide range of educators, and others, are interested in fostering creativity. In particular, governments generally recognise the value of creative abilities because of their economic potential. Also, deep and systematic studies have probed the way cultures express and value creativity (Niu and Kaufman 2013). Importantly, the dominant notion of creativity can vary from culture to culture. While the notion of creativity in most cultures probably includes some variety, governing notions vary and when they seem the same, different elements may be valued differently (Kimbell 2000; Lin 2011; Morris and Leung 2010).

As economies become internationalized and people become more mobile, variations in views of creativity need to be recognised, in businesses and, particularly relevant here, in education. In a highly interconnected 21st-century world, viewing creativity only from one perspective, conceivably Eastern or Western, is not enough. Amongst others, teachers will need to allow for variety in notions of creativity and the value placed on them (UNESCO 2006). They will need to know what counts as creativity, not only in their own culture, but also in the variety of cultures represented in their student population. They will be expected

to prepare their students to be creative in the society in which they will grow and live, but also to provide them with an awareness of other perspectives and values.

With increased mobility and access to digital information, it seems likely that ideas and values will change more quickly than before. Given widespread perceptions of the role novelty plays in supporting economic growth, prevailing Western notions directed at achieving novelty may spread, supported by attempts to foster Western ideologies because of the freedom and independence associated with being creative (Siegesmund 1998). When Western ideas of creativity are supported in schools, students are more motivated, have higher self-esteem and achieve more (Moore 2008; QCA 2004). While governments may see creativity as a means of achieving economic growth, the self-reliance and empowerment which creative skills may also bring could generate tensions. Such tensions—freedom versus control, or rote learning versus problem solving, for example—find their way into education systems and determine programmes of study. It cannot be routinely assumed, therefore, that the attendant benefits experienced in the West will always follow elsewhere.

More immediate, however, is the evidence from around the world which suggests that teachers need guidance on what counts as creativity and how to support and nurture the creative processes in their students. Cheng (2010) argues that teachers are caught in a causal loop in which systemic, cultural and individual barriers all inhibit the fostering of creativity. He argues that a top-down model for introducing creativity into the curriculum does not work; what is needed is to start with training the teachers, both in pre-service and continuing professional development courses. Training needs to cover the nature of creativity and how it varies with context, the idea that most students should practice and develop whatever creative abilities they have and strategies which foster creative thinking processes and problem solving. But how are teachers to acquire this knowledge and skill, given that training varies around the world from none to formally accredited courses? The provision of adequate training is an issue which will need to be addressed.

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