



Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:

de Bruin, L;Harris, A

Title:

Training teachers for 21st century creative and critical thinking: Australian implications from an international study of creativity in secondary schools.

Date:

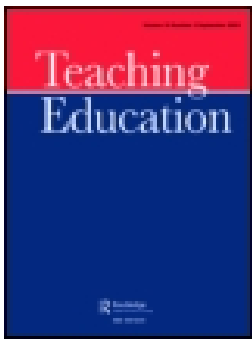
2018

Citation:

de Bruin, L. & Harris, A. (2018). Training teachers for 21st century creative and critical thinking: Australian implications from an international study of creativity in secondary schools.. *Teaching Education*, 29 (3), pp.234-250. <https://doi.org/10.1080/10476210.2017.1384802>.

Persistent Link:

<https://hdl.handle.net/11343/311552>



# Training teachers for twenty-first century creative and critical thinking: Australian implications from an international study

Anne Harris & Leon R. de Bruin

To cite this article: Anne Harris & Leon R. de Bruin (2017): Training teachers for twenty-first century creative and critical thinking: Australian implications from an international study, Teaching Education, DOI: [10.1080/10476210.2017.1384802](https://doi.org/10.1080/10476210.2017.1384802)

To link to this article: <http://dx.doi.org/10.1080/10476210.2017.1384802>



Published online: 07 Oct 2017.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



# Training teachers for twenty-first century creative and critical thinking: Australian implications from an international study

Anne Harris<sup>a</sup> and Leon R. de Bruin<sup>b</sup>

<sup>a</sup>School of Education, Design and Social Context, RMIT University, Melbourne, Australia; <sup>b</sup>Faculty of Education, Monash University, Melbourne, Australia

## ABSTRACT

Creativity in education is currently dominated by discourses pertaining to both a neo-liberalisation of arts education and a more widespread attention to the economic potential of diverse creativities. This study applies new thinking regarding creative educational advancement that is adaptive and critically reflexive to the tasks of reconciling the need for safe, ethical and empathetic learning environments and the production of adaptive and innovative twenty-first century workforces. This study of Australian secondary schools analyses perceptions, understandings and actions, and impediments to creativity in classrooms. This study asserts significant implications for the need to foster effective environmental and ecological approaches to engaging in creative practices in Australian secondary schools. It establishes a creativity index through which school leaders and teachers can routinely measure, develop and adjust their school environment's, students' and teachers' creative skills and capacities, pedagogic practices and assessment of creativity across the education lifespan.

## ARTICLE HISTORY

Received 29 April 2017  
Accepted 15 September 2017

## KEYWORDS

Creativity; creative and critical thinking; teacher education; Australian curriculum; general capabilities

## Introduction

A major challenge for teaching in the present climate of global education, curricular organisation, delivery, and the changing standards concerning ranking and assessability, is in the way teaching practice reflects desirable social, cultural and economic needs of the twenty-first century. In an education era dominated by a discourse of transferability, scalability and innovation, teaching approaches to creativity continue to represent both a standardisation and reduction of discipline-specific arts education and a more widespread attention and emphasis regarding creative industries and economic potential.

Desire for greater creativity and innovation is now a widespread mandate across education, industry and government sectors (Cho et al., 2011; Craft, 2005; Flew, 2012; Taddei, 2009). However, Australia is already falling behind in training our young people for these emerging 'creative economies' that will be required as we move into a globally networked future. The new Australian Curriculum (ACARA 2016b implementation of Arts) has put special emphasis on promoting integrated creativity development across a range of learning areas, rather than

discipline-based arts training. Whilst primary education has long boasted a strong cross-curricular creativity focus, the siloed nature of secondary education has made this more challenging. In Australia, creative industries are seen as the crucial twenty-first century economic replacement for mining and other export drivers, yet creativity continues to be under-represented and misunderstood by teachers, especially in secondary schools (Harris, 2014).

Creativity in Australia has moved to the centre of necessary educational skills and capacities through inclusion in the Australian Curriculum's General Capability of *Critical and Creative Thinking* (ACARA 2016b), whilst school leaders and educators still lack a clear and consistent approach to its training, implementation or assessment (ACARA, 2016a; AITSL, 2011b). The Australian Institute for Teaching and School Leadership (AITSL 2011b) and Graduate Teacher Professional Standards emphasise the growing complexity and responsibilities for professional and pre-service teachers, neither of which recognise the centrality of creative skills and capacities within education (Harris & Ammermann, 2016; Simon, 2013). Australian national and state governments (Australian Government, 2016; MCEECDYA, 2008) and national education bodies (ACARA 2016a; AITSL, 2011a) have expressed concern regarding the dramatic emergence and concern towards creativity, asserting the need for programmes of study that equip our teachers with the skills necessary to strengthen twenty-first century student outcomes socially, educationally and economically.

The essential need of inculcating and developing creativities across the curriculum in the Australian Curriculum (ACARA 2016b) (including, importantly, secondary education) positions creativity as a cornerstone of teacher education. This emphasises the need to address teachers' pervasive fear and discomfort regarding mandatory creativity skills demanded by the national curriculum, offering teachers better training in the development, recognition and assessment of students' creative and critical thinking skills (Harris, 2016). By understanding what creativity is and how it manifests in classrooms, better and more effective modes of teaching and learning can affect the educational intervention and improvement of creative and critical thinking in our students. Research shows that the main impediment to implementing creative pedagogies in classrooms is teachers' fear or unfamiliarity with creative approaches and skills (Flew, 2012; Harris, 2016; Burnard, 2006). Curriculum guidelines such as the UK's Qualifications and Curriculum Authority (2004) suggest how teachers can 'spot' and act upon creativity and further posits five creative behaviours: 'questioning and challenging', 'making connections and seeing relationships', 'envisioning what might be', 'exploring ideas, keeping options open' and 'reflecting critically on ideas, actions and outcomes', as broad general pedagogic approaches to promoting creativity. How teachers instigate, develop and nurture this in their classrooms are aspects of creativity research in education that require significant further exploration.

This study addresses a major gap in creativities education, exploring consistent and measurable definitions of creativity, appropriate methods to develop creativity, and approaches to developing pedagogical and transdisciplinary understandings of creativity's role in education (Harris, 2014). This Australia-centred, mixed-method investigation offers adaptive and critically reflexive implications to the tasks of reconciling the need for safe, ethical, empathetic, creative learning environments within secondary schooling. Identifying and enhancing the transferability of creative dispositions and skills in learners is confluent with the determining of the Melbourne Declaration on Educational Goals for Young Australians (MCEECDYA, 2008) articulating a shift from arts-based definitions of creativity towards internationalisation, inter-disciplinarity and implicit skills-bases that can be availed to support

creative industries. International evidence suggests that schools need help to better identify and develop practical tools for fostering creativity, and urges the need to re-examine risk-averse secondary school environments and practices in compulsory years' schooling (Arts Council Wales, 2015; House of Commons, Education & Skills Committee [HCEC], 2007; Lucas, Claxton & Spencer 2013a; OECD, 2012).

## Overview of study

Creativity has been identified as one of the three most significant skills across all subject curricula, spanning from pre-primary education to lifelong learning (Curriculum Development Council, 2001; National Staff Development Council, 2001). Creativity within Australian schools is shaped by the Australian Curriculum (ACARA 2016b), that places an emphasis on promoting integrated creativity development across a range of learning areas, rather than discipline-based 'creative arts' training. That is, whilst primary education has long boasted a strong cross-curricular creativity focus, the siloed nature of secondary education has made integrated and interdisciplinary focus and organisation of teaching and learning more challenging. Analysing the interrelationship between innovation, critical and creative thinking in secondary classrooms, this study investigates how schools can, and in some cases are, nurturing creative dispositions, skills, and knowledge and utilising frameworks for sustainable approaches to teacher-education in creativity.

## Methodology

This mixed method study reports from a statistically valid, large quantitative and qualitative data-set. Mixed methodology enabled both quantitative statistical analysis of a survey administered to students, as well as qualitative analysis that captured a narrative richness of experiential, environmental and personal expressions of teacher and administrator perceptions of creativity within their school. This phenomenological approach explored teachers' reflections of their practice and the way they perceived students' understandings of creativity. This aspect of the study realised rich, thick description of the participants' beliefs, experiences and reflections that enabled a focus on the personal lived experience, perspective and interpretation of the participants (Creswell, 2008; Smith, 2015).

## Quantitative data

Surveys of 30-min duration were administered to 681 year 8 and 9 (13–14 years) Australian students from Queensland, Victoria, New South Wales, Tasmania, Western Australia and the Northern Territory that allowed students to confirm creative spaces, climates, experiences and teacher practices perceived as promoting creativity in their schools. This survey, drawing on the Lucas 'Five dispositions Framework' outlined in Lucas et al. (2013) Creative Partnerships UK, responded to reflections about their current school environment. Students were asked to respond to a Likert type scale (1–5) questions such as,

To what extent:

Creative achievements are recognised and celebrated at my school?

The teachers encourage me to personalise aspects of learning so it's more meaningful to me?

I get the chance to do a project or activity that cuts across subjects?

### **Quantitative data analysis**

Statistical and survey data were coded and analysed using Dedoose software. Of the Australian student participants in the survey, 64.9% considered that 'creative achievements are recognised and celebrated at my school'. Student respondents replied that 62.6% of 'teachers encourage me to personalise aspects of my learning so it's more meaningful to me'. A scant 55.5% said that 'the school listens to the students'. Only 48.7% felt that 'every year I get the chance to do a project or activity that cuts across subjects'. These results from student perspectives contrast with what teachers and leaders aspired to offer in terms of creativity skills enhancement. Student reality conveyed by the quantitative data offered very different perspectives to how teachers and school leaders expressed their perception of student experiences in the qualitative data analysis. The stark absence of interdisciplinary approaches within schools eschews research that indicates such practices provide the conditions for creativity more than any other single factor (Harris, 2016). This indicates a clear dissonance between creativity literature and the practices of the schools, which will now be investigated further via the qualitative investigation.

### **Qualitative data**

The qualitative data gathering process included interviews with two teachers and one school leader/administrator from an extensive sample set of schools containing 24 groups from the sample set across Australia. The qualitative investigation engaged a two-pronged approach to data collection. In this first gathering, two teachers and one administrator were interviewed. Participants responded to questions such as;

- Give a description of a creative example in your classroom
- Is creativity emergent in your classes by you alone, or with others?
- Describe what chances you give students to be 'imaginative and develop their own ideas'?
- What do you think being creative means?
- What skills and effort were involved in nurturing creativity?
- How could my school environment be more creative?
- Describe the most creative teacher at the school.
- Do you believe creativity is measurable in the work you do (if so, in what way?)
- How could creativity be measurable and enhanced in high school contexts or practices?

The teachers were asked to identify creative experiences within their classrooms and opportunities for their creative approaches, their own professional creativity education development, and 'hot spots' (classes, extracurricular groups and activities, spaces) in which creativity thrived in their schools, or in which they as teachers and leaders felt they could experience or lead creative pursuits. This initial interview allowed administration and staff to identify signifiers of creativity, and informed their judgements on the selection of student cohorts who could take part in the second phase of data collection.

Secondly, focus groups comprising 7–10 teachers/administrators and students were asked to creatively develop visions of an ideal creative school. These groups were given 30 min to

collaborate via writing, speech, song, act or drawing, and this rich contextualising data was recorded and analysed. The focus groups, a mixed blend of students and teachers comprising 52% female and 48% male participants, discussed reflections that were 'embedded and immersed in a world of objects and relationships, language and culture, projects and concerns' (Smith, Flowers, & Larkin, 2009, p. 21) and articulated the shaping of creative experiences, creative processes, collaborations, and the affordances and constraints to creativity.

### ***Qualitative data analysis***

Participant interviews were transcribed, coded and analysed by the lead researcher. The transcripts were firstly open-coded through an 'immersion approach' that established preliminary interpretations (Pothoulaki, MacDonald, & Flowers, 2012; Robson, 2002). Multiple readings accompanied by general note taking summarised chunks of data into initial groupings of nine emergent themes (Charmaz, 2003). These interpretations were grouped together, revealing distinctive categories of thematically separated experiences in which qualitative data are represented from both teacher and student participants: creative facilitators, creative environments, curriculum and pedagogy, school leadership/policy visions, and impediments to creativity.

### **Findings**

The study reports on a wide and holistic appraisal of creative people, environments, visions and indeed restrictions to creativity experienced in secondary schools by the participants, revealing a dynamic interplay between teachers' personalised strategies and creative effort, strategies and creativity constructed interpersonally through peer/teacher communications and interplay.

#### ***Teachers as creative facilitators***

Effective dynamic interpersonal connections between teacher and student engaged in appropriate activities can nurture problem solving, divergent thinking and the nurturing of flexible, imaginative 'possibility thinking' (Craft, 2005) involving the developing of conceptualisations which are new to the person having them (not necessarily new in themselves). Educating for creativity involves space: in the curriculum, and the class, to take risks, to learn and move forward (de Bruin, 2016; Harris, 2016). Teacher practice that elicits and promotes creativity emerges as a consequence of a teacher's 'schemes of action and perception ... that may be necessarily imperfect but also a little miraculous' (Bourdieu, 1990, p. 130). Teachers are at the forefront of making the conditions for creativity within a safe environment so that the students feel comfortable to fail, learn and move forward. Whilst high stakes summative assessment tends to deter risk taking: in both students and school staff, formative approaches encourage dialogue, iteration of inquiry and perseverance.

Teacher respondents articulated differences and similarities in the way they understood creativity, and the way it appeared in their classrooms. Teachers described creativity as involving a pattern of identifiable transferable skills and abilities involving problem-solving, imagining possibilities, criticality/critical reflection, open-mindedness/flexibility thinking, teamwork/collaboration, risk-taking, questioning, and developing mastery through a toolbox

of theoretical and practical ways of working. Class activities that engaged and developed curiosity/independence, empathy, analytical skills, resilience, complexity, and communication were desired. One teacher revealed the dispositions and mindsets teachers bring to their classes and the ways they vitalize creative thinking:

The way we question students in class is a vital start to developing creativity. We have to think what do we want students to know about creativity? Do we want them to be able to identify creativity, or apply the processes of creativity? We want them to grapple with knowledge and understanding, processes and the value of creativity. I develop student thinking about what does it mean to be creative and what can that offer us as learners?

This teacher discussed creativity inducing approaches that could be utilised in the classroom:

We can use a design thinking approach or an enquiry-based model, or even passion-based learning, we just need time and space to develop within our schooling model. There's a lot of teachable moments that can spark creativity and creative processes.

Creatively engaging and effective teachers understand that, as facilitators of creative thought and action, they must take a lead role in the development and nurturing of critical thinking. By modelling, coaching, scaffolding and eliciting articulation, reflection and confidence in creative thought and practice, teachers can fade their own creativity inducing strategies and allow students to flourish in a creative cognitive apprenticeship (Collins, Brown, & Holum, 1991). Students referred to masterful, influential teachers in many subjects who modelled creativity, who introduced and scaffolded them through creative processes, which they experienced for themselves and which transformed them and the possibilities they envisaged for others by assisting learners to plan for and develop their creativity. This student reflects on a learning module:

We thought about creativity individually and in small groups- we shared ideas and put them into practice in our work. There were moments of deep self-questioning, and periods of intense 'see what happens'. We had to talk about what we made, respond to it with the class, sharing our successes and failures, and knowing that the framework for this was towards a portfolio and reflective assessment made me respond well.

A social view of creativity sees that manifestations of creativity are almost always the result of complex collaborations across social groups (Harris, 2016). Frameworks might allow sufficient scope for the social element of creativity to be accounted for, and through specific inclusionary practices and strategies students are helped to value and develop their creativity and enhance aspirations, achievement, and skills.

### ***Creative environments***

Research has shown that both the physical and social environments impact creativity (Hunter, Bedell, & Mumford, 2007; and that characteristics of this social environment affect whether and how creativity emerges (Bourdieu, 1993; Csikszentmihalyi, 1996; Gardner, 1993). Teacher-participants described the learning environment they tried to create, describing classes as an 'incubation bed', with teachers as 'trainers' who mentored students and acted as role models. The need to explore, take risks and recalibrate thinking within a safe and trusting environment that included the relationship between teacher and student, were considered important by the teachers. They stressed the value of environments which facilitated students' learning at their own pace, describing that it took time for students to learn to be

creative, and trust their curiosity, judgements and confidence within an empowering creative landscape. Patience was noted by a number of participants. One teacher put it best: 'we go as fast as we can but as slow as we must'.

Many participants described their encouragement of students' immersion in 'problem-finding' tasks, with the teacher used as a sounding board to enhance discoveries and experiences that initiate and sustain creative endeavours. A strengths-based approach was seen as crucial to building trust and establishing creative environments via trusting relationships. Research shows that both students and teachers are more creative in environments in which personal control can be exerted over activities and the environment (Amabile, 1995; Ryan & Deci, 2000). Domain transformative creativity is promoted when students have independence of perspective; a self-awareness of individual sense (Vygotsky (1978), and a thoughtful interaction and connection to the environment and their collaborators (Moran, 2009).

Creativity in classrooms was perceived as not a benign, procedural expectation, but rather emergent from teachers that fervently propagated its formative development and nurtured the 'creative moments', developing strategies of how to ride its wave, to celebrate its quirkiness, and to cut it free rather than tie it down through effective pedagogical practice. Creative thought, effort and collaboration were deemed possible within any domain and possible across multiple inter-disciplinary ways. The following teacher recollection captures such epiphanous occurrences that typified many of the respondents' reflections:

We know that streaming students actually de-skills that cohort, even though you are treating them as special. You put the same kids in a multidisciplinary environment, a multi-skilled and multi-tooled environment, and you differentiate the learning within the classroom. The skillsets that they bring when they are nurtured in that way is far superior.

The sites of creativity were perceived as being not exclusive to art domains, and students articulated how learning and creativity in one area of study could transform understanding in other areas. This student describes their experience of transferable creativity:

I was about seven when I began experimenting through piano. It was just a way of life and it's just seeing things differently and stretching a capacity, not just drawing in the arts or music, but in literature, maths and science and all of those things, it taught me to free my mind.

A common characteristic of approaching the teaching of creativity 'is the emphasis on the environment in which creativity occurs. The implications for creativity education are substantial, and researchers are beginning to investigate the ways that systems approaches can be used to develop creativity-fostering environments in educational settings' (Plucker & Renzulli, 1999, p. 46).

### ***Curriculum and pedagogy***

The limitations of curricular direction upon subjects are suggested by Craft (2008) as a significant inhibiting influence on developing the skills involved in thinking and learning, documenting and support progression in creativity. Teachers can enable students to explore beyond mere internalisation of external abstract knowledge, and develop convergence and divergence of creative thought, diverse ideas and a multiplicity of perspectives (Matusov & Marjanovic-Shane, 2014). Effective teacher–student dialogue can enhance a student's individuality through relationships with teachers, collaborators and aspects of the creative process (de Bruin, 2016). Such a teaching and learning dynamic can arrange a confluence of ideals and aims, where a thinking-together approach can help students to develop an

intersubjective understanding and orientation towards one another that supports the creation of dialogic spaces (Wegerif, 2007). This teacher discusses dialogic approaches and experientially situated environments that promote wider thinking:

I've been looking at the way Indigenous communities have used creative methods to engage their students from their communities by literally teaching in a culturally appropriate way. And that means bringing lessons outdoors, talking and exploring alternative perspectives. That means using the resources, traditional resources to get content across and get conceptualisation happening. Creativity for me is thinking outside the square, exploring hypothetical points for kids to talk about together – being intellectually creative and a bit daring, history is about shifting sands.

Other teachers were drawn to the growing focus on STEM/STEAM (Science, Technology, English, Arts, Mathematics), promoting creativity through understanding interdisciplinary connectedness and how this can facilitate problem-solving. Some teachers utilised arts as a means of developing kinaesthetic and emotional involvement in mathematical and science-based activities. Others used the arts as an engaging analytical lens of investigation that enhanced authentic real-world perspectives to problem-solving in mathematics and sciences. While it currently seems as though STEM is more widely taken up without the A for Arts, this teacher sees the value of keeping the arts included:

The idea of STEAM – it is interdisciplinary and therefore provides rich possibilities for transfer between subject silos. Perhaps 'fluidity' between subject silos is more apt. There's lots of blending going on, digital media will do things for math and also English. Students write a story in English and then film it during media, make music to it, create sets and props in studio art, there's so many possibilities. This can be achieved by teachers collaborating across disciplines. This is working 'wiser' not longer! It has profound effects – connectedness between students and between colleagues.

A whole school approach to creativity was viewed as a significant success in one school, by this teacher:

A group of teachers developed an integrated learning project using humanities, the arts, applied studies and the humanities kids who researched all the names behind the War Memorial, 281 of them. Students and teachers together devised a play that brought the figures in the War Memorial to life. It was an amazing project. We had seven performances, we've never had seven performances ever here, it was so moving...

Whilst innovative curriculum and pedagogical approaches were discussed by numerous teachers, assessment proved to be problematic in this study, as noted widely in current curriculum and scholarly research. Teachers reported the difficulty of adhering to prescriptive, or in some cases standardised, assessment and reporting guidelines for creative skills and capacities better suited to a 'process' measure than the more standard 'product' focus. Teachers that utilised pedagogies that nurtured creativities described 'limitations', 'draw-backs' and inequality in the way conventional assessment rubrics unsuccessfully captured student learning, processes and products adequately. They noted that, in developing and fostering individual and collaborative creativities in classrooms, there is greater but still insufficiently acknowledged need to approach assessing students' understandings of conceptual and practical aspects of their creative works. Cowdroy and de Graaff (2005, p. 515) describe the need for double paradigm shift in teacher pedagogy and assessment, 'from teacher-derived criteria for examination of work to student-derived criteria of assessment of the student's understanding of his or her own concept in terms of the philosophical and theoretical frameworks of the relevant field of creativity'. Similarly, Lucas and Claxton argue

for assessment that focuses on the learner: 'our experience suggests that finding ways of tracking and articulating progression in wider skills may well best be done in collaboration with the learners themselves' (2009, p. 31). In some schools, a culture of expectation in accumulating vital information required for successful passage through testing was well entrenched. This teacher discusses her senior school students' attitudes and expectations:

VCE has become such a programmed learning-design construct that it drives teachers to deliver formulated information in quite wooden ways. Our Physics teachers have been doing some really interesting work, I think, in flipped classrooms and doing some interesting work with the kids, but the kids universally don't like it and their response often is, 'Just give us – tell us what's going to be in the test'.

### ***School leadership/policy visions***

Creative school environments are fostered by principals who adopt optimistic 'glass half full' approaches that encourage working from within to try to build staff capacity and confidence. Participants described this crucial creativity-enabling work as: 'building capacity'; 'celebrating her capacity'; 'giving her permission to develop the capacity of others'. Principals establish and maintain the environment of a school through activating strategies that encourage productive risk-taking (a core component of creativity), and assuage teachers' and students' 'fear of failure'. Administration and school leadership are, as Harris (2016) and Flew (2012) suggest, a significant component of schools that can effectively model creative skills and capacities and establish creative environments within the whole school community. As confident and creative teachers felt, creativity was diminished or enhanced depending on school policy and leadership views towards creativity. One teacher remarked:

It's that leadership trust, first of all, that allows you to devise strategies that enhance creativity, and the various opportunities that are either given to me via other domain leaders and opportunities that allow me suggest successes in my classrooms.

One principal reported that the best strategy was having their staff well educated in the area of creativity 'so that it flows "naturally" into what they do. The pedagogy is driven by the understanding of creative thinking as a high order form of thinking'. Some administrators and teachers spoke of their STEM environments as 'works in progress', admitting mathematics and science staff were slowly evolving pedagogies and modules of work that produced enriching learning outcomes. Other staff bemoaned the fact that 'we have a STEM academy for creative industries and they set it up around mathematics and technologies, but they are using design, graphics, 3D imaging and collaborative work spaces based around arts practice- they missed the point entirely'.

One principal discussed an effective and compelling example of engaging in creative practice:

In Years 7 and 8 we have a subject called 'design in futures' that broadly sits in a design process, design thinking silo and specifically attempts to synthesise or immerse students in a couple of curriculum areas simultaneously with the intent of celebrating enquiry and problem solving. It contextualizes content and allows for the demonstrating of student knowledge through creative output. We talk about creative output in the context of the ability to synthesise content, experience, and research and present findings in an original way.

Timetabling was perceived as a crucial inhibitor or enabler to creativity. Timetabling to support creativity enabled cross-disciplinary work that broke down discipline silos, encouraged

trust and professionalism within teaching teams, and exploring creative ways of conducting and presenting on projects. This example exemplified cross-disciplinary engagement:

Our students participate in a 'topic of the month' in which different disciplines contribute questions to a topic; water – the science of it, the chemistry of it, rising water levels with climate change, drought and scarcity of water resources, piping water from one part of Victoria to another – this promotes rich creative investigation across domains.

### ***Impediments to creativity***

The teacher and student participants all articulated significant aspects of learning and teaching that constrained and restricted the flow of creative processes in class.

Teachers pedagogically felt they lacked the skills and preparedness to teach in a way that elicited creative responses and thinking. Within subject areas, younger teachers felt it often harder to get older, more experienced staff to experiment and diverge from tried and tested class methods and management styles. Teachers felt little compulsion to invest in developing classroom pedagogies when administration and the prevailing cultural milieu within the school remained ignorant and not pro-active in promoting discourse and inquiry into incorporating creativity within pedagogical and curriculum applications. Institutionally within schools those teachers who were intent on facilitating and promoting creative capacities in their students expressed frustration regarding barriers to cross-disciplinary collaboration. Lack of time to brainstorm, collaborate, develop and plan programs, exchange ideas and enact deeper critical and creative activities than what was already catered for, was the most desired, yet most scarce, of creative resources. Coupled with a crowded curriculum, teachers lamented the limited opportunities for 'what if' moments, 'possibility thinking' (Jeffrey & Craft, 2006), collaborative student-teacher relationships, rejection of subject silos, and the use of collective 'inquiry' spaces that enabled the classroom to be a cognitive, social and cultural laboratory of thinking and action. Teachers and principal participants were critical of endemic cultural habits within the school, from lack of engagement and relevance extending to parents' and students' expectations and narrow definitions of success, and what creative, critical thinking should look like in twenty-first century secondary schools.

With a focus on assessment and aversion to risk-taking, students acclimatise to rubrics and scores, convergent thinking capabilities, directing their energies to immediately correct, but limited, thinking. In supporting such learning, teachers are actually encouraging in students a perverse incentive to creativity. Within many school cultures this is perhaps the norm rather than the exception. As one teacher remarked:

In terms of creativity, lots of our kids are more interested in what they need to do to get the big score, to get to where they want to get, they're making some really pragmatic decisions about where they put their time and energy. To get creative outcomes you have to stick your neck out a bit and the kids who are going to do that are probably not the conformists or ones who are going to succeed in a highly structured environment.

### **Implications for creativity in secondary schools**

Schools face the imperative of meeting the educational and economic demands of the twenty-first century. Schools need to adopt more forward thinking, strategic planning, design and cross-curricular connectivity that enhance creativity through the environments and relationships nurtured within. Whilst the development of creative literacies, teacher

education and awareness of creativity, and the use of assessments that enhance and not constrain creativity have been posited (Harris & Ammermann, 2016, p. 110), this study clearly details and defines a more nuanced exploration of the ways in which administrators, teachers, students and parents can negotiate and better understand creativity in learning and teaching in our schools. Innovative strategies that can enhance creativity and the boundary crossing/cross-disciplinarity of teacher pedagogies, spaces/environments that incorporate real-world relevance with partnerships to creative industries can redefine how teachers teach for creativity in their classrooms. This study demonstrates that instilling and developing creativity in our school is incumbent on teachers, administration, teachers and school councils to critically assess risk-averse procedures and plans, put into action well intended meaning and rhetoric and redevelop school cultures of the past so as to better shape learning cultures of the future.

The concept of teaching emergent creativities evolves not only as a fluid entity but also as a relational practice that represents temporal, inter-relational and technological mediations. The future development of creative development in secondary schools is dependent on the transcending of both a critical ontological and cultural appropriating of creative processes and products. Of increasing urgency now is that teaching and administration within secondary schools critically reflects on the siloed and separated domains of learning, steadfastly held and implemented, and 'negotiate between apparently incommensurable worlds' (Born, 2005, p. 11) and devise a networked interconnectivity of creative capacities, processes and products.

As flatlining Australian national NAPLAN results in December 2016 (ACARA 2016a) heighten the impasse reflected by current literacy and numeracy outcomes, schools and their students' learning can benefit by adjusting school cultures that support shared philosophies of teachers' creative professional development which will in turn nurture student creative capacities. Teachers, as creative experimenters, are the 'agents, the models, and the motivating forces for their students' (Gaunt, 2008, p. 215). Teachers are 'a source of creative capital when they develop powerful peer-to-peer engagement processes that enhance their students' learning' (McWilliam & Haukka, 2008, p. 4). Today's teacher training, more than ever, necessitates the need to question the habits of institutional procedures, practices and approaches, the effectiveness and pertinence of curricula and pedagogies, and the habits of mind they inculcate in their students. The way schools invest in ongoing professional development that enhances the modelling of creative practice and possibility thinking in teachers and future school leaders and breaks the tenets of conformity, repetition and risk aversion can establish school values that nurture tomorrow's creative workforce.

### **Assessment and measurement of creativity of schools**

Policy reform that reaches across education and economic platforms can benefit from an internationally comparative tool. Following an increasing wave of national and regional Creativity Indexes (including Ireland, the US, Scotland, Hong Kong, the European Creativity Index, the Welsh Govt Action Plan (Arts Council Wales, Creative Learning through the Arts 2015–2020) which are primarily economic measures, an Australian Creativity Index that considers educational structures and approaches from within Australia would be a significant step to assessing and reporting on levels of creativity within schools. Such a Creativity Index might join and balance the international literacy and numeracy standards that currently (and narrowly) comprise international comparative tables such as PISA and the OECD league tables.

<b>Harris Creativity Index</b>
Strategy 1 – creative approaches / teacher development
Strategy 2 – cross-curricular collaboration
Strategy 3 – allowing students to lead
Strategy 4 – real-world skills and assessment
Strategy 5 – creative partnerships / links with community
Strategy 6 – better resources
<i>Through these areas of professional development, school leaders should commit to ongoing development serving the following three core foci:</i>
<b>Focus 1</b> – Creative environments
<b>Focus 2</b> – assessing Creative processes and products
<b>Focus 3</b> – Creative Industry partnerships

**Figure 1.** Harris creativity index (Harris, 2016, p. 118).

The Harris Creativity Index (Figure 1), used in conjunction with the Whole School Creativity Audit (Appendix 1), provides one consistent and measurable tool that can assist schools or policy-makers to comprehensively address creativity education in an *ecological* way. It is also a school-based measure which might contribute to a national Creativity Index for consistent measurement across contexts.

## Conclusion

Creativity is experiencing a global revolution, and the teachers' experiences and reflections in this study add to understandings of the ways creativity can be developed, promoted and encouraged as a fundamental building block for twenty-first century learners. Of significance to developing creativity in students are the ways in which creative learning cultures are instilled in schools and policy. If teachers or students see knowledge as a static entity to be acquired, rather than a dynamically organised body of cultural tools employed, then resistance to change will occur. Teacher education is at the forefront of epistemological change that improves emerging teachers' mastery of the self and an effective dynamic classroom culture, not just the absorption of existing cultures following employment in schools. This investigation, examining teachers, environments, curriculum and pedagogies that facilitate and impede creativity, reveals that improving creative and critical thinking in secondary schools is a complex one. Perhaps the biggest obstacle to being creative in secondary classrooms is not just allocating sufficient time, or appropriate and thoughtful testing, it may be a fear of failing.

What is transmitted and represented through creative teaching for creative learning are narratives which allow the society in which they are told to define its criteria of competence and to evaluate according to those criteria what is performed or can be performed within it. Massumi (2002) refers to 'the margin of manoeuvrability'; the 'where we might be able to go and what we might be able to do in every present condition' (p. 212). Creative teaching and creative learning activity constitutes measurably different pedagogies from traditional

forms of 'doing', 'knowing' and 'know-how'. Creative teaching and creative learning brings together experiential dimensions of time/body relations and environments, offering new priorities, new possibilities, and new ways to think about success.

Practising teachers, and higher education's development of pre-service teachers should consider how creativities cultures can be grown in future student populations. This study offers evidence to the field of teacher education as encouragement toward greater flexibility, collaboration, and improvisationally adept education. Secondary schools must find a way to make more room for creative risk, innovation and imagination in order to adequately prepare students for creative workplaces and society, including attention to assessment of creative skills and capacities. Teachers foster creativities education through (1) what they explicitly value and enrich in students, (2) the ways dialogue interpersonally and in groups is used to enhance creative experiences, (3) how they themselves model creativities, (4) how they ascribe value to each individual students' experiences of higher order and growth mind-set thinking, and (5) how they present themselves as discerning, diverse creative beings. As Australian education meets the challenges of developing, teaching and measuring creativity, discourses in creative industries, education policy and everyday teacher practices advance concepts of interdependency and cross-curricular integration of learning and teaching. Whilst further substantive study of creativity in schools is essential, this Australia-centred, international and mixed-method study on understanding creativity in secondary schools is a significant step forward.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### Funding

This work was supported by an Australian Research Council DECRA [grant number #DE140100421] entitled *The Creative Turn: An Australia-wide Study of Creativity and Innovation in Secondary Schools* (2014–2016).

### Notes on contributors

**Anne Harris** is a Principal Research Fellow (Research Associate Professor) in the School of Education and the Digital Ethnography Research Centre, RMIT University, and an Australian Research Council Future Fellow (2017–2021) researching creativity, performance and digital media. She is a native New Yorker and has worked professionally as a playwright, teaching artist and journalist in the USA and Australia. She holds both Master and Bachelor degrees from New York University where she studied playwriting. In addition to her plays, she has published over 60 articles and 10 books that address the arts, culture, and performance, including her latest book *Creativity, Religion and Youth Cultures* (Routledge, 2016).

**Leon R. de Bruin**, PhD, is a teaching assistant in Education at Monash University, School of Education and has completed studies in performance and education (B, Ed Music, L.R.S.M, A. Mus. A) and works primarily in the areas of education, creativity, diversity, performance and performing arts and digital technologies. Leon worked professionally as a musician, composer and educator, and has published in numerous international and national refereed journals. He reviews for a number of well-respected journals, and has presented papers at international music, creativity and education conferences. He has been the recipient of a Monash University Chancellors Commendation for Excellence (2017), The Australian Society for Music Education Callaway Doctoral Award (2017), and the Monash University Postgraduate Publications Award (2016).

## References

- Amabile, T. M. (1995). *KEYS: Assessing the climate for creativity*. Greensboro, NC: Center for Creative Leadership.
- Arts Council Wales. (2015). *Creative learning through the arts: An action plan for Wales 2015–2020*. Cardiff: Department for Education and Skills.
- Australian Curriculum, Assessment and Reporting Authority. (2016a). NAPLAN. Retrieved from <http://reports.acara.edu.au>
- Australian Curriculum, Assessment and Reporting Authority. (2016b). *Australian curriculum general capabilities/critical and creative thinking*. Retrieved from <http://www.australiancurriculum.edu.au/generalcapabilities/critical-and-creative-thinking/introduction/introduction>
- Australian Government. (2016). *Creative Australia*. Retrieved from <http://creativeaustralia.arts.gov.au>
- Australian Institute for Teaching and School Leadership. (2011a). *Accreditation of initial teacher education programs in Australia: Standards and procedures*. Retrieved April 4, 2013, from [http://www.aitsl.edu.au/verve/\\_resources/Accreditation\\_of\\_initial\\_teacher\\_education.pdf](http://www.aitsl.edu.au/verve/_resources/Accreditation_of_initial_teacher_education.pdf)
- Australian Institute for Teaching and School Leadership. (2011b). *Teaching teachers for the future*. Retrieved April 4, 2013, from <http://www.aitsl.edu.au/ttf/ttf-project.html>
- Born, G. (2005). On musical mediation: Ontology, technology and creativity. *Twentieth-century Music*, 2(01), 7–36.
- Bourdieu, P. (1990). *The logic of practice*. Stanford, CA: Stanford University Press.
- Bourdieu, P. (1993). *Sociology in question*. London: Sage.
- Charmaz, K. (2003). Grounded theory. In J. Smith (Ed.), *Qualitative psychology: A practical guide to research methods* (pp. 81–110). London: Sage.
- Cho, N., Oh, E., Kwon, J., Kim, H., Chi, E., & Hong, W. (2011). *A study on the improvement of secondary school education to bring up students' creative talents. KICE research report*. Seoul: Korea Institute for Curriculum and Evaluation.
- Collins, A., Brown, J. S., & Holum, A. (1991). Cognitive apprenticeship: Making thinking visible. *American Educator*, 15(3), 6–11.
- Cowdroy, R., & de Graaff, E. (2005). Assessing highly-creative ability 1. *Assessment & Evaluation in Higher Education*, 30(5), 507–518.
- Craft, A. (2005). *Creativity in schools*. Abingdon: Routledge.
- Craft, A. (2008). Tensions in creativity and education. In G. Claxton, A. Craft, & H. Gardner (Eds.), *Creativity, wisdom, and trusteeship: Exploring the role of education* (pp. 16–34). Thousand Oaks, CA: Corwin Press.
- Creative Australia. (see Australian Government / Creative Australia above)
- Creative Victoria. (2015). *Creative state global city: Creative industries taskforce report 2015*. Retrieved from [http://www.strategy.creative.vic.gov.au/application/files/8414/4857/8019/Taskforce\\_Report\\_updated.pdf](http://www.strategy.creative.vic.gov.au/application/files/8414/4857/8019/Taskforce_Report_updated.pdf)
- Creative Victoria. (2016). *Creative industries, commerce and the creative economy: What has been achieved*. Retrieved from <http://creativeaustralia.arts.gov.au/archived/module/creative-australia-pathways/theme-connecting-to-national-life-for-a-social-and-economic-dividend/pathway-creative-industries-commerce-and-the-creative-economy/creative-industries-commerce-and-the-creative-economy-what-has-been-achieved/>
- Creswell, J. W. (2008). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York, NY: Harper Perennial.
- Curriculum Development Council. (2001). *Learning to learn: The way forward in curriculum development*. Hong Kong: Government Printer.
- de Bruin, L. R. (2016). *Expert practitioner voices: A phenomenological inquiry into teaching, learning and collaborating in musical improvisation*. Melbourne: Unpublished Doctoral thesis, Monash University.
- Flew, T. (2012). *Creative industries: Culture and policy*. London: Sage.
- Gardner, H. (1993). *Creating minds*. New York, NY: Basic Books.
- Gaunt, H. (2008). One-to-one tuition in a conservatoire: The perceptions of instrumental and vocal teachers. *Psychology of Music*, 36(2), 215–245.

- Harris, A. (2014). *The creative turn*. Rotterdam: Sense Publishers.
- Harris, A. (2016). *Creativity and education*. London: Palgrave Macmillan.
- Harris, A., & Ammermann, M. (2016). The changing face of creativity in Australian education. *Teaching Education*, 27(1), 103–113.
- House of Commons, Education and Skills Committee. (2007). *Creative partnerships and the curriculum: Eleventh report of session 2006–2007*. Great Britain: Parliament.
- Hunter, S. T., Bedell, K. E., & Mumford, M. D. (2007). Climate for creativity: A quantitative review. *Creativity Research Journal*, 19(1), 69–90.
- Jeffrey, B., & Craft, A. (2006). Creative learning and possibility thinking. In B. Jeffrey (Ed.), *Creative learning practices: European experiences* (pp. 73–91). London: The Tufnell Press.
- Lucas, B., & Claxton, G. (2009). *Wider skills for learning: What are they, how can they be cultivated, how could they be measured and why are they important for innovation?*. London: NESTA.
- Massumi, B. (2002). Navigating moments. In M. Zournazi (Ed.), *Hope: New philosophies for change* (pp. 210–243). Sydney: Pluto.
- Matusov, E., & Marjanovic-Shane, A. (2014). Democratic dialogic education for and from authorial agency: An interview with Professor Eugene Matusov. *Europe's Journal of Psychology*, 10(1), 9–26.
- Ministerial Council for Education, Early Childhood Development and Youth Affairs. (2008). *The Melbourne declaration on educational goals for young Australians*. Retrieved from [http://www.mceecdya.edu.au/mceecdya/melbourne\\_declaration,25979.html](http://www.mceecdya.edu.au/mceecdya/melbourne_declaration,25979.html)
- McWilliam, E., & Haukka, S. (2008). Educating the creative workforce: New directions for twenty-first century schooling. *British Educational Research Journal*, 34(5), 651–666.
- Moran, S. (2009). What role does commitment play among writers with different levels of creativity? *Creativity Research Journal*, 21(2-3), 243–257.
- National Staff Development Council. (2001). *NSDC standards for staff development*. Retrieved from <http://www.nsd.org/library/standards2001.html>
- OECD. (2012). *Creative problem-solving: Students skills in tackling real-life problems (Volume V)*. Paris: PISA/OECD.
- Plucker, J. A., & Renzulli, J. S. (1999). Psychometric approaches to the study of human creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 35–61). New-York, NY: Cambridge University Press.
- Pothoulaki, M., MacDonald, R., & Flowers, P. (2012). An interpretative phenomenological analysis of an improvisational music therapy program for cancer patients. *Journal of Music Therapy*, 49(1), 45–67.
- Qualifications and Curriculum Authority. (2004). Retrieved from [www.qca.org.uk/creativity](http://www.qca.org.uk/creativity)
- Robson, C. (2002). The analysis of qualitative data. In C. Robson (Ed.), *Real world research: A resource for social scientists and practitioner-researchers* (pp. 455–499). Oxford: Blackwell.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Simon, S. E. (2013). Chaos of textures or 'Tapisserie'? A model for creative teacher education curriculum design. *Australian Journal of Teacher Education*, 38(11), 87–102. doi:10.14221/ajte.2013v38n11.2
- Smith, J. A. (Ed.). (2015). *Qualitative psychology: A practical guide to research methods*. London: Sage.
- Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis: Theory, method and research*. Thousand Oaks, CA: Sage.
- Taddei, F. (2009). *Training creative and collaborative knowledge-builders: A major challenge for 21st century education*. OECD Background Paper. Retrieved from <http://cri-paris.org/wp-content/uploads/2007/04/ocde-francois-taddei-fev2009.pdf>
- Vygotsky, L. S. (1930/1978). *Mind in society: The development of higher mental processes*. (M. Cole, V. John-Steiner, & E. Souberman, Trans.). Cambridge, MA: Harvard University Press.
- Wegerif, R. (2007). *Dialogic education and technology: Expanding the space of learning*. Computer-Supported Collaborative Learning Series. Berlin: Springer.

## Appendix 1. Whole school creativity audit

School policies and practices		
<i>External policies</i>		
1.1	Are we aware of the national economic and education policies that address creative education?	YES/NO/ Review
1.2	Are we aware of the state-based policies and initiatives that support creative education?	
1.3	Are we aware of the ways in which the national curriculum or department of education in our district addresses creativity in education?	
1.4	Do we effectively share these documents and visions with our students and staff?	
<i>Internal policies</i>		
1.5	Do we actively pursue ongoing development of internal evaluations of our creative capacities, rather than defer to external requirements?	
1.6	Do our creativity policies and structures reflect the uniqueness of our community and place?	
1.7	Do our students and staff have input into our creative strategies?	
<i>Teacher professional development</i>		
1.8	Do we demonstrate a commitment to creativity by proactively and universally offering creativity PD to all staff and students?	
1.9	Do we recognise creativity as a skill that must and can be developed, reflected in our PD programme?	
<i>Whole-school creative practices</i>		
1.10	Do we actively programme whole-school activities that foreground creativity as artistry or innovation?	
1.11	Do we have (or are we working toward) commitment to improving our creative skills and capacities as a learning community, including the leadership of the school?	
The Product (curriculum, assessment, timetabling)		
<i>Individual creativity</i>		
2.1	Do we actively reward setting creative outcomes across the curriculum?	
2.2	Do all teachers in our community share equally in offering more creative modes of student demonstration of knowledge, and incorporating assessment criteria that assess the creativity component of all student work?	
2.3	Do our school leaders prioritise creative education here by adjusting the timetable to allow both students and staff time for practicing creative skills and capacities including: curriculum innovation, cognitive creative exercises and games, tolerance for ambiguity, peer- and student-led brainstorming and information-sharing?	
<i>Collective creativity</i>		
2.4	Do we reinforce the notion that creativity is nurtured in collaborative and collective endeavour?	
2.5	Do we provide opportunities for students and staff to work collectively in creative ways?	
2.6	Do we value the outputs of collective creativity in our school community, rather than ignore or discard the outputs?	
<i>Thinking creatively</i>		
2.7	Do we provide opportunities for our students and staff to demonstrate their creativity in class or outside of class time?	
2.8	Do creative products and efforts receive as much academic status or value in our community as other subjects and outputs do?	
2.9	Do we actively articulate the belief that creativity is a thinking capacity, and is not the same as artistic ability?	
<i>Doing creativity</i>		
2.10	Do we provide opportunities for our students and staff to demonstrate their creativity in class or outside of class time?	
2.11	Do students and staff ALL have opportunities (and an obligation) to practice creative thinking, doing and sharing in our school?	
2.12	Is creative endeavour reinforced as a core component of academic success at this school, not just a 'time out' of serious academic work?	
The Process		
<i>Individual creativity</i>		
3.1	Do we actively work against test-like activities as often as possible, knowing this inhibits creative thinking?	
3.2	Do we actively work towards re-balancing our assessment structures towards measuring process rather than product?	
3.3	Do we prioritise collectivity and collaboration?	
<i>Collective creativity</i>		
3.4	Do we prioritise collectivity and collaboration in our timetable?	
3.5	Are we committed to timetable changes to enhance opportunities for collective creativity?	

(Continued)

**Appendix 1. (Continued)**

The Process	
3.6	Do we reward collective-developed original and innovative work at our school?
<i>Thinking creatively</i>	
3.7	Do we encourage thinking creatively as a crucial skill for all students and staff?
3.8	Do we reinforce the tangible value of process over product in the creative lifecycle?
3.9	Do we explicitly teach creative thinking as part of all subject areas?
<i>Doing creativity</i>	
3.10	Do we actively programme whole-school activities that foreground creativity as artistry or innovation?
3.11	Do we allow students to demonstrate creative thinking in non-arts-based areas of enquiry?
3.12	Do we explicitly reward creative innovation as a workplace skill that this school champions?
The School Environment	
<i>In relationship with students</i>	
4.1	Are we prepared to give students more autonomy, emphasising the need for self-discovery as a core creative skill, even as it impacts a change in the timetable, bells, or student movements throughout our school? YES/NO/Review
4.2	Do we reinforce the importance of communication in creative idea-sharing?
4.3	Do we actively reinforce the importance of risk-taking and nonconformity in problem-solving, for both academic, creative and real-world successes?
<i>In relationship with staff</i>	
4.4	Do we make opportunities for staff to intermingle, talk informally, and share ideas?
4.5	Do staff feel a sense of control and autonomy in their work?
4.6	Do we encourage curiosity in our staff, or compliance?
<i>The physical environment</i>	
4.7	Does the school site clearly provide collaborative spaces?
4.8	Does the school site encourage both individual and collaborative brainstorming?
4.9	Does the school layout work actively against centralising the standardised subjects and marginalising the creative subjects and practices?
4.10	Does the school work to integrate a range of environments (e.g. outdoor, indoor, quiet, interactive).
Creative Partnerships	
<i>Local</i>	
5.1	Do we creatively contribute to our local community, including parents, local organisations, and local government?
5.2	Do our school community members have a clear and creative vision of who we 'are' and what the school might be in 5, 10, 20 years' time?
5.3	Do our students and staff actively seek ways to break down the walls between our school and local community?
<i>Global</i>	
5.4	Do we pursue new opportunities to link to the non-local world?
5.5	Does our school nurture links between the local-global in our students?
5.6	Do we actively nurture creative global connections, or share the ones we already have in our student and staff body, as real world learning opportunities?
<i>Artistic</i>	
5.7	Are we proactive in recognising the creative value of artistic input into our school?
5.8	Do we pursue links with expert artists in the same way we pursue relationships with expert business, science, or industry professionals?
5.9	Do we as a school make explicit links between creative, artistic and marketplace success – and work against outmoded science/business/arts dichotomies?
<i>Business</i>	
5.10	Do we initiate opportunities for creative sponsorship, mentorship or project-based links?
5.11	Do we actively celebrate the creative potential of industry links, and share the responsibility of developing these links amongst the students and staff community?
5.12	Do we showcase the creative and innovative work in our school to local and global industry leaders, not just others in education?