Using the Arts to Develop a Pedagogy of Creativity, Innovation, and Risk-Taking (CIRT)

Christine Cho
Nipissing University
Ontario, Canada
christinech@nipissingu.ca

John L. Vitale
Nipissing University
Ontario, Canada
johnv@nipissingu.ca

Abstract

This paper considers the complex and somewhat nebulous term "creativity", exploring the ways in which the pedagogical phenomenon we call "CIRT" (an acronym) can enrich classroom approaches so as to enhance Creativity, boost Innovation, and encourage Risk-Taking. In addition, we review elements that impact the creative process and explore concepts of freedom, as well as the constraints and parameters of creativity. In our role as teacher educators, we explore the connection between teaching and creativity by outlining three key examples of approaches that utilize the CIRT framework including: synesthesia, imagination, and audiation activities.

Keywords:

teacher education, pedagogy, creativity, innovation, risk-taking

Using the Arts to Develop a Pedagogy of Creativity, Innovation, and Risk-Taking (CIRT)

Contextual Framework and Purpose

Current trends in education are predominately concerned with effective uses of technology and the preparation of our youth for future careers in the sciences (Reamer, Ivy, Vila-Parrish & Young, 2015). It is not surprising, therefore, that policy makers highly value STEM education (science, technology, engineering, and math), a system that privileges the modernist philosophy of a "factory model of education" (Nezvadal, 2003). Moreover, STEM is touted as the necessary component in ensuring future economic prosperity (STEMEducationCoalition, 2014).

Compounded with the focus on STEM is an emphasis on accountability and the proliferation of standardized testing in our schools. Essentially, what gets tested is what gets taught (Herman, 2004). Fortunately -- or unfortunately -- standardized tests for the arts are mostly non-existent in Westernized countries. Music, drama, dance, and visual arts, therefore, do not get the same attention as literacy and numeracy initiatives.

As a field of study, the arts are often recognized as a conduit for creativity, innovation, and risk-taking. Yet, many teachers (both generalists and specialists) teach the arts using a very predictable, linear, and formulaic approach lacking in creativity, innovation, and risk-taking, not unlike the pedagogical models found in mathematics, science, and language. Many teachers, for example, follow a step-by-step and do-it-this-way mode of instruction. In music, for instance, students learn musical notes in a hierarchical structure (easy to hard), are told what notes to play in a performance, and are provided with guidelines on exactly how to execute and articulate each note (loud, soft, quick, slow, etc.). Such a rigid pedagogical style cultivates and nurtures compliance and dependence, rather than empowerment and independence, which are the very hallmarks of true education (Bowman, 2005). Empowerment and independence can be cultivated through the teaching of musical improvisation and/or musical composition, which lie at the very core of creativity, innovation, and risk-taking. Ironically, the step-by-step and "do-it-this-way" mode of instruction imposes arts education approaches that are uncreative, non-innovative, and non-risk-taking.

Within the general educational community, however, a step-by-step and "do-it-this-way" mode of instruction is considered effective pedagogy by many. After all, such pedagogy is by its very nature highly organized and expectation-based, with a backwards design philosophy (Graff, 2011). We teach what we want the students to learn, which creates a standardized teaching and learning environment on a daily basis. This so-called "effective" pedagogy tends to be highly affiliated with conservative, conventional, and conformist practices at the expense of students' ability to be creative and innovative risk takers (Moore, 2004). This conservatism, conventionality, and

conformity is reinforced by the common curriculum in most countries, which is compartmentalized according to the subject matter (Literacy, STEM, Social Sciences, and the Arts), atomized regarding the pedagogical delivery of said subject matter (lessons, units, and tests), organized and formatted according to grade level, and correlated to a system of evaluation that is standardized across an entire political jurisdiction (province/state).

As teacher educators, our principal purpose is therefore to encourage a new pedagogical phenomenon that breaks away from a step-by-step and "do-it-this-way" mode of instruction rooted in conservatism, conventionality, and conformity. We refer to this new pedagogical phenomenon as CIRT, an approach that enhances *Creativity*, boosts *Innovation*, and encourages *Risk-Taking*. We deem these critical aspects of pedagogy, particularly given the diminished role of the arts in the overall school curriculum (Robinson, 2006). Moreover, we contend that CIRT fosters dynamic, fluid, and engaging teaching and learning experiences that positions students to be critical, flexible, and adaptable thinkers, which will be critically important in a world where 80-85% of the jobs available in the year 2030 have not yet been invented (Tencer, 2017).

Specifically, we are interested in sharing the ways in which we have successfully used observation and exposure to visual and auditory activities in our own pedagogy. This has helped develop creativity, innovation, and risk-taking among the visual art and music students that we teach: generalist elementary teacher candidates enrolled in a two-year teacher education program in Ontario, Canada, the country's largest province, with a population of over 14 million people. First, we review the extant literature, wading through the myriad of ways of defining creativity. Second, we further explore creativity in relation to the concept of freedom and some perceived parameters and constraints. Third, we discuss the ways in which innovation and risk-taking are inherent parts of creativity and the creative process. Fourth, we outline our theoretical framework and define "creative pedagogy," as well as how we developed the CIRT framework. We conclude by offering 3 examples of CIRT approaches.

What is Creativity? A Review of the Literature

During a paper presentation at a National conference on teacher education, we were asked how we as researchers and educators define "creativity"; it is from this position that we wish to begin our discussion. The concept of "creativity" is an elusive beast (Burnett, 2010). A definition of creativity is not easily sought or found. In fact, trying to define it may be contradictory to its very essence, hence its elusiveness. "Creativity is a mystery, and many people believe that it should remain a mystery" (Johnson-Laird, 1988, p. 202).

Creativity may be sight and sound dependent. As Baer and McKool (2014) argue, the measure of creativity is made by so-called experts in a given field. That is to say, creativity is often measured against the status quo

and is culturally and historically positioned. As Kaufman (2009) argues, “there are different ways in which someone can be creative and there are almost as many different ways that people try to measure creativity” (p. 9). As teacher educators and, in particular, arts educators, we may have a particular concept of “creativity” that differs from STEM teachers, for example.

In the STEM field divergent thinking tasks might be used to measure creativity (see Silvia, Martin, & Nusbaum, 2009). Neuroscientists may try to map the brain to determine if creativity is domain-specific (see Gonen-Yaacovi et al. 2013). Regardless, it should be noted that, as Vartanian (2015) argues, creativity in diverse fields necessitates skills in diverse areas.” For example, creative writing requires linguistic skills and intelligence while architecture requires visual/spatial skills and intelligence, perhaps somewhat in keeping with Gardner’s (1993) Multiple Intelligences Theory. Specifically, Gardner (1993) divides human intelligence into identifiable modalities (musical-rhythmic, visual-spatial, verbal-linguistic, logical-mathematical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalistic intelligence) instead of perceiving intelligence as a single general ability.

Runco (2014), however, argues that creativity plays a role in many things but is a distinct entity unto itself:

> Creativity can be expressed in diverse ways (e.g. art vs. science), and sometimes involves different processes (e.g. cognitive or social). It is also influenced by many different kinds of things, including personality, genetic makeup, social and environmental setting, and culture. The notion that creativity is complex represents one of the most widely accepted views. (p. xii)

The lack of scholarly consensus, therefore, further adds to the aforementioned elusiveness of creativity. More often than not, concepts of originality, innovation, and risk-taking are often linked with definitions of creativity. However, as one researcher recently quipped, creativity, or taking creative risks, is not always desirable such as when you visit the dentist (Lewis, 2015). However, even Lewis' tongue-in-cheek remark regarding dentistry can be contested. The Canadian Dental Association (2016) states that creativity is a big part of dentistry that requires strong artistic elements such as a focus on visual aesthetics.

Cyndi Burnett argues that individuals have more success at solving problems when they are trained in problem solving (Burnett, 2015). Creativity, however, seems to entail more than solving a problem. Perhaps there is an unconscious aspect, a so-called interior transformation of the non-conscious mind. Mihnea Moldoveanu (2015), for example, refers to creativity as “visceral”. The word “visceral” or “visceral reaction” suggests a condition characterized by instinct rather than intellect. “Visceral” is the plural of viscus which, in medical terms, refers to organs of the digestive system, especially those in the abdomen, which suggests creativity is a "gut

instinct" or that the concept of creativity lies within us; it is just a matter of knowing how, or when, to access it.

In their systematic review of education literature on creativity and creative environments, Davies et al. (2013) found that there are several factors that support creative development, namely:

> flexible use of space and time; availability of appropriate materials; working outside the classroom/school; 'playful' or 'games-based' approaches with a degree of learner autonomy; respectful relationships between teachers and learners; opportunities for peer collaboration; partnerships with outside agencies; awareness of learners' needs; and non-prescriptive planning. (p. 80)

Of key importance for us was their finding that "further research is required to identify the link between curricular areas and creativity, with a view to identifying the best ways of embedding creativity in a cross-curricular context" (p. 89). The researchers found that impediments to teachers' use of creative pedagogies included "the pressures of the 'performativity culture', time, curriculum, assessment and the level of professional development" (p. 89).

Freedom, Constraints and Parameters

Deepening our discussion of creativity, we turn to the examination of three key elements that may positively or negatively impact creativity and the creative process: freedom, constraints and parameters. We begin with a discussion of freedom.

John Franklin suggests that "freedom" is a key characteristic of creativity (Franklin, 2015). The concept of freedom suggests a social justice perspective (the freedom for students to do/create what they want, which ties into a Freirean philosophy of education, in addition to a holistic view of education); a thinking-out-of-the-box perspective; a "no labels no limits" approach to learning; a non-standardized approach to evaluation.

However, freedom, while closely associated with creativity, does not mean "without boundaries". In fact, many artists and musicians and so-called "creative" people may quantify creativity as having the freedom to make/think/do within a system of constraints
– either internally or externally imposed. That is, the notion of parameters and constraints is imposed by artists and musicians not to limit freedom but as a way to access possibilities (Shalley & Gilson, 2004).

Creativity might also be a response to certain conditions (Rosso, 2011). In publicly funded schools, for example, teachers must find creative solutions to working with limited resources and funding. How many music teachers have asked for more money for programs only to be told by their administration: "you have to be more creative when you have less money to work with"? Glück, Ernst, & Unger (2002) argue that:

> The degree of “constrainedness” of a creative activity may be one important factor: Naturally, the more constraints a creative person is facing in his or her work, the more important is the ability to produce something creative while still fulfilling these external demands. (p. 65)

Likewise, it has been argued that too many restrictions and constraints might quash creativity (Amabile, & Gitomer, 1984). In their research on creativity and the workplace, Hennessey and Amabile (2010) found the following:

> It appears that constraints and pressures in the work environment (except for one rare form of time pressure) are detrimental to creativity, whereas organization-wide supports, psychological safety, sufficient time, autonomy, developmental feedback, and creativity goals are facilitative. (p. 583)

Hennessey and Amabile (1988) previously argued that there is a correlation between a higher number of external constraints and an increase in intrinsic motivation as a coping mechanism. Further, they found high self-esteem conducive to increased intrinsic motivation.

Is creativity a synonym for innovation and risk-taking? Innovation is tantamount to change but is also often defined through a lens of creativity; the concept of innovation usually involves some aspect of risk-taking. In the end “creativity” implies originality, expressiveness, uniqueness of thought, idea, and expression. Creativity is also innovative expression with the ability and willingness to take risks to productively solve problems and craft new ways of knowing. It is through the intertwining of creativity, innovation and risk-taking that we build the foundation of CIRT.

Creating A CIRT Pedagogy

Making Linkages: Teaching and Creativity

We believe that being a creative and innovative risk-taker as a teacher is synonymous with teaching creativity, innovation, and risk-taking as an entity. Given this synonymy, we argue it is impossible to teach the entity of creativity, innovation, and risk-taking through a predictable, linear, and formulaic pedagogy. Rather, a pedagogy that actively models creativity, innovation, and risk-taking simultaneously teaches students the very essence of said principles, regardless of the subject matter.

Horng, Hong, ChanLin, Chang, & Chu (2005) refer to personality traits commensurate with “teacher creativity”: persistence, self-confidence and a sense of humor. Lin (2011) refers to teacher ethos as “maintaining an open attitude toward creative ideas or behaviors, showing a humanistic pupil control ideology (as opposed to being authoritarian), being flexible and valuing independence thinking” (p. 149). Building upon and strengthening

creative attributes amongst teachers may in turn trickle down to the students they teach.

As Cheng (2004) and Wu (2004) argue, teachers are not overly responsive to suggestions of increasing creativity in their teaching particularly in relation to the teaching of the arts. When it comes to teaching the arts, there is a strong perception that ability is an inborn trait, with these so-called “talents” reserved for a select few (Heyning, 2011). Heyning argues for the encouragement of skill building in the arts amongst pre-service teachers to develop confidence and explore ways to achieve competencies.

Theoretical Framework: Creative Pedagogy

Theoretically, we situate our exploration of CIRT within the context of creative pedagogy (Lin, 2011), reflective practice (Schön, 1983; 1987), and holistic education (Miller, 2007). There are numerous concepts or ideas that are used to refer to creativity and/or pedagogy. Lin (2011) sets out a theoretical framework which involves a three-pronged approach, namely, (a) creative teaching, (b) creative learning, and (c) teaching for creativity. Herbert (2010) links creativity and psychoanalysis in her development of a “pedagogy of creativity” and Woldt (2009) refers to “creative pedagogy” through a Gestaltian (holistic) framework.

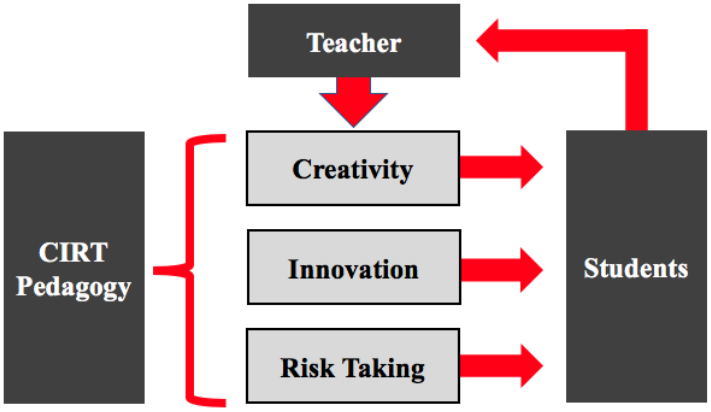
We are interested in teaching creativity, innovation, and risk-taking through the arts (Gallas, 1994), in particular, by exploring the ways in which observation/exposure activities can be used to develop “teacher creativity”. The literature on arts education (Dewey, 1934; Eisner, 1994; Oreck, 2004) suggests exposure to the arts and learning through the arts also fosters greater risk-taking. Can teacher educators teach their students to be creative risk-takers in the classroom and, in the process, take risks to (a) show the students that the teacher is practicing what s/he is preaching (modelling risk-taking); and, (b) to naturally foster and cultivate risk-taking student behaviour? Even though pre-service teachers are relatively inexperienced and may struggle with the basic nuts and bolts of their chosen profession, we wholeheartedly contend that the answer to this question is a decisive “yes.” The most important first step in this process is changing the reputation that creativity has garnered over the years. Somehow, creativity has become the antithesis of critical thinking, as Azzam (2009) states:

> People see creativity and critical thinking as being opposed. It's partly because people associate creativity with being totally free and unstructured. But what we really have to get hold of is the idea that you can't be creative if you don't do something. (p. 22)

Ultimately, creativity is a major part of, and inseparable from, the critical thinking process.

We maintain that a pedagogy rooted in creativity, innovation, and risk-taking generates a series of connected and interwoven benefits for both

teachers and students fostering creativity as a condition for learning (Figure



1). From a pedagogical perspective, CIRT cultivates cutting edge teachers who think out-of-the box, problem solve in unique ways, and embrace failure as part of the teaching and learning process. Moreover, CIRT pedagogy is very transmissible, ultimately manifesting itself in the minds of students. In this way, CIRT is also a form of reciprocal education (Tuhiwai Smith, 2006). This positive flow of ideas and thoughts ultimately makes its way back to the teacher and as such, is a step towards countering so-called "normalized ideologies" (Boler & Zembylas, 2003).

In essence, we propose a culture change within teacher-education programs. In order to foster such a culture change, we contend that teacher educators must perceive creativity, innovation, and risk-taking as celebrated, dynamic, and meaningful approaches to pedagogy. Moreover, a pedagogical culture change can be fostered by providing pre-service teachers with a number of theoretical and philosophical ideologies (see Kozbelt, Begheuo, & Runco, 1990), as well as focusing on a climate and culture of "creativity" as opposed to equating creativity with "giftedness" and "talent" (Craft, 2005).

Developing CIRT approaches: The Space between Music and Noise . . . Between Art and Scribble

We believe that arts-based interactive strategies (specifically music and visual arts) deepen students' connection and engagement with two genres of the arts, as well as enhance meaning making and promote higher-level thinking in other subject areas. Specifically, we are interested in the ways in which focused exercises specific to visual arts and music can facilitate creativity, greater risk-taking, innovation, attentiveness, heightened observation skills, and prepare learners to be more open-minded. Research by Roden, Kreutz, and Bongard (2012) reveals a relationship between learning to play a musical instrument and increased verbal memory abilities, such as an increased ability to learn more words (20% increase) with greater word retention. The research suggests that learning to play an

instrument may mirror effective reading strategies such as chunking and reading for meaning and looking for syntactic cues.

Learning to play an instrument also has long-term memory enhancing effects. In relation to music, students come to understand how pitches come together to form a musical line much in the same way phonemic awareness is developed when children understand how sounds come together to form words. Both experiences enable learners to make sense of the sounds that they hear. Combining the two experiences together increases auditory memory in both music and literacy. Similarly, the act of singing helps children to differentiate between their speaking and singing voices, understanding register, and dynamics (Tarbert, 2012). In addition, learning to perform musically enhances long-term memory as the act of memorization is a key aspect of performance. As Eisner (1994) argued, “We cannot know through language what we cannot imagine. The image -- visual, tactile, auditory -- plays a crucial role in the construction of meaning through the text. Those who cannot imagine cannot read” (p.15). What we also know is that when students are engaged in their learning, they are more invested in their learning and that the arts are an underutilized strategy for student engagement. There never seems to be enough “time” in the school day/week/year to engage fully with the arts, which brings us to our next key point, the role of “space” in creativity.

Space

Friesen (2015) spoke about the space between music and noise, albeit one person’s noise might be another person’s music. Perhaps there is also a visual corollary – such as the space between art and scribble. The idea of space and creativity seems to link to the apparent “downtime” or “breaks” necessary for creative thought. The creative process necessitates an internalizing of ideas, time for processing, and an opportunity to gain perspective. In this way, there appears to be an interior transformation that then pushes the exterior realization of the creative moment.

From an improvisation perspective in music, space can be used in order for the musician to think about what he/she will play next. Space can also be used to allow the listener to digest musical phrases (much like a speaker uses pregnant pauses). However, improvisation in jazz is often a barrage of notes with very little space. In this setting, the truly great artists can actually internalize what they are going to play 2-3 seconds into the future, even as they are playing notes in the present. In other words, what they are playing now was actually thought about and internalized a few seconds in the past. Hence, the act of downtime often does not exist in jazz. This ability to simultaneously play and think into the future comes from trial and error (risk-taking) and practice, which may involve the “downtime or breaks necessary for creative thought”.

In Augusto Monk’s (2015) documentary “What Goes Behind the Creative Process”, he interviewed Pier-Paolo Alberghini (an architect), who

said that he would spend several hours in silence (eating his lunch) at the building site before he started to draw plans for the project at hand. He claimed that each site tells him exactly what type of building to design. This is part of a visual internalization or the “emotional, cognitive, and visceral” characteristics of creativity (Moldoveanu, 2016).

As teacher educators we wonder if, where, or how “space” is provided in the elementary and secondary school systems. Wearing (2015) postulates that creativity is about “producing an independent and non-mimicking learner”. The Ontario Arts Curriculum's definition of creativity states, “Creativity involves the invention and the assimilation of new thinking and its integration with existing knowledge” (Ontario Ministry of Education, 2009p. 19). The Ontario Arts Curriculum also maintains that,

> Creativity does not occur in a vacuum. Art making is a process requiring both creativity and skill, and it can be cultivated by establishing conditions that encourage and promote its development. Teachers need to be aware that the atmosphere they create for learning affects the nature of the learning itself. (p.19)

As Cremin, Burnard and Craft (2006) found, space and time allowed the learners in their study to flex their creativity, which in turn cultivated autonomy.

Specific CIRT Strategies and Approaches

It is critical to provide pre-service teachers with meaningful and concrete strategies that promote creativity, innovation, and risk taking. We propose several CIRT pedagogical approaches to facilitate pre-service teacher confidence. These include, but are not limited to: (a) exploring the aspects of synesthesia, (b) drawing “blind”, and (c) focusing on specific audiation techniques and strategies. For example, in a previously published article (Cho & Vitale, 2014), we explored the concept of student engagement with interactive art strategies. In the article, we described some specific audiation techniques. The following are some additional strategies and suggestions that specifically relate to CIRT pedagogy.

Ultimately, there are numerous benefits that exposure to the arts and learning through the arts fosters including greater risk-taking, improved student perception, concentration, awareness, and motivation to name a few (Dewey, 1934; Eisner, 1994; Oreck, 2004). What follows are three strategies that cultivate imagination (thinking in the language of images), audiation (thinking in the language of sound) and synesthesia (fusing of visual and auditory senses). With our own students, for example, we have implemented synesthetic learning activities, where students would “see with their ears and hear with their eyes.” Specifically, students would listen to music, and attempt to create visual artwork using colours and shapes to represent the music that they heard, essentially fusing the senses. Likewise, students

would also observe visual images, and try to compose basic musical compositions based on such images. In either case, students were risk taking through the act of creating and interpreting, problem-solving in a holistic and artistic manner, and thinking-out-of-the-box by being asked to fuse their senses (synesthesia).

Our imagination and audiation strategies are also designed to enhance student creativity, innovation, and risk-taking through examples rooted in popular culture. Specifically, we have chosen the Mona Lisa by Da Vinci for our imagination strategy, “the best known, the most visited, the most written about, the most sung about, the most parodied work of art in the world” (Lichfield, 2005). For our audiation strategy, we have chosen *Yesterday* by the Beatles. In many ways, Yesterday is the Mona Lisa of the auditory world as it holds the Guinness Record for being the most-covered song (recordings done by other artists) in the world with over 3,000 renditions (Bernstein, 2015). Moreover, “Yesterday” was voted the number one pop song of all time by MTV and Rolling Stone magazine in 2000, and has had over 7 million performances in the 20th century alone.

Strategy A: Imagination

In your mind’s eye, create a mental picture of Da Vinci’s Mona Lisa (or *La Gioconda*) and hold on to that image as long as possible. Now, answer the following questions:

Q. What is the colour of her hair and eyes?
A. Brown (but she has no eyebrows or eyelashes, possibly a status symbol of the time)
Q. What is the most often discussed feature of this portrait?
A. Her smile
Q. Of what style or period of art is the Mona Lisa an example?
A. The Renaissance (the painting was done over several years, 1503-1519)
Q. What medium did Da Vinci use to paint the Mona Lisa?
A. Oil paint

Strategy B: Audiation

Now, in your mind’s ear, recreate the song Yesterday as originally recorded by the Beatles.
Q. What instrument starts the song before the vocals come in?
A. Acoustic Guitar
Q. What are the first four lines of the song?
A. Yesterday
All my troubles seemed so far away
Now it looks as though they’re here to stay
Oh, I believe in yesterday
Q. What is the tempo of the song?
A. 95 Beats Per Minute
Q. What is the key signature of the song?*

A. F Major

Which task was more difficult? The first component of the task, imagination (thinking in the language of images), or the second component of the task, audiation (thinking in the language of sound)? For most people audiation is more challenging because of its abstractness. Moreover, we live in a world that is visually biased, where children learn to identify colours between three to five years of age (Shelov & Altmann, 2009). The same, however, cannot be said about musical notes. In fact, even among the ranks of professional musicians, only a select few have the ability to instantly recognize isolated musical notes without any context, known as perfect pitch.

Finale

Engagement in arts-based instructional strategies not only cultivates creativity, innovation, and risk-taking, but also foster literacy, numeracy, higher order thinking skills. From a literacy perspective, arts-based instruction and interactive strategies can serve as a method to explore the technical terminology associated with visual arts and music (see Ontario Arts Curriculum glossary, 2010). The process allows students to build an art-based vocabulary to communicate the effect and affect of the arts. From technical descriptions to emotional thoughts and sentimentalities, the building of an arts-based vocabulary goes a long way to advance literacy.

From a numeracy perspective, arts-based instructional strategies provide ample opportunities to engage in mathematical principles. In fact, the intricacies of visual art can often be described in mathematical terms -- patterns, lines, contours, geometry, symmetry, perspective, and ratios. Da Vinci's Mona Lisa, for example, was painted according to the golden ratio (1:0.618), which is a ratio that is said to be aesthetically pleasing to the human eye. Moreover, the very foundation of music (rhythm and sound) is built on principles of mathematics and physics. So deep is music's connection to numeracy that many ancient Greek philosophers such as Pythagoras and Plato actually considered music a branch of mathematics. Ultimately, arts-based instructional strategies provide mathematical and scientific experiences and understandings that demonstrate the interconnectedness and holistic nature of our world.

Arts-based instructional strategies also encourage higher order thinking skills. Great works of art (visual and music) are layered, multifaceted, and complex in their meanings. Works of art have the capacity to inspire philosophical and critical inquiries that allow us to (a) analyze, synthesize, and evaluate works of art against historical and societal norms, and (b) question who and what we are and what our place is in the universe – capacities that are far above and beyond the lower order thinking-skills of knowledge, comprehension, and application.

Ultimately, the arts are worth learning for their own sake. We contend that they are also an exceptional pedagogical tool that fosters numerous

ancillary benefits, as well as student engagement and success across the entire curriculum. Moreover, we believe that the arts provide students with many intangible elements outside of the curriculum, which help to shape and positively influence society. In sum, a pedagogy imbued with creativity, innovation, and risk-taking allows educators to cultivate aesthetic experiences that lie right at the very heart of teaching and learning in the classroom and beyond.

References

Amabile, T. M., & Gitomer, J. (1984). Children's artistic creativity: Effects of choice in task materials. *Personality and Social Psychology Bulletin, 10,* 209–215.

Anderson, D. (2002). Creative teachers: Risk, responsibility and love. *Journal of Education , 183* (1), 33-48.

Author A & Author B (2014). Cultivating Student Engagement Through Interactive Art Strategies. *Research Into Practice Series: A research-into- practice series produced by a partnership between the Student Achievement Division and the Ontario Association of Deans of Education (Research Monograph #53),* Ontario Ministry of Education.

Azzam, A. M. (2009). Why creativity now? A conversation with Sir Ken Robinson. *Educational Leadership*, *67*(1), 22-26.

Baer, J., & McKool, S. S. (2014). The Gold Standard for Assessing Creativity. *International Journal of Quality Assurance in Engineering and Technology Education (IJQAETE)*, *3*(1), 81-93.

Bernstein, G. (2015). *Understanding the Business of Entertainment: The Legal and Business Essentials All Filmmakers Should Know*. CRC Press.

Boler, M., & Zembylas, M. (2003). Discomforting truths: The emotional terrain of understanding difference. In P. Trifonas (Ed.), *Pedagogies of Difference: Rethinking Educatoin for Social Change* (pp. 110-136). New York: RoutledgeFalmer.

Bowman, Wayne (2005) Why Musical Performance? Views Praxial to Performative. In D. Elliott (Ed.), *Praxial Music Education: Reflections and Dialogues (pp.142-164). New York:* Oxford University Press.

Bronson, P. & Merryman, A. (2010, July 10). The Creativity Crisis. Newsweek, Retrieved from http://www.newsweek.com/creativity-crisis-74665

Burnett, C. (2010). *Holistic Approaches to Creative Problem Solving.* (Unpublished doctoral dissertation). Ontario Institute for the Studies of Education at the University of Toronto, Toronto, Ontario, Canada.

Burnett, C. (2015, January). Creativity as Problem Solving. Paper presented at the Interdisciplinary Colloquy to Understand Creativity, Toronto: University of Toronto, Faculty of Music.

Canadian Dental Association (2016). Pursuing a career in dentistry. Retrieved at https://www.cda-adc.ca/en/becoming/becoming/

Cheng, V. M. Y. (2004). Progress from traditional to creativity education in Chinese societies. In S. Lau, A. N. N., Hui, & G. Y. C. Ng (Eds.), *Creativity: When East meets West.* Singapore City: World Scientific.

Cho, Christine & Vitale, John L. (2014). Cultivating Student Engagement Through Interactive Art Strategies. *Research Into Practice Series: A research-into-practice series produced by a partnership between the Student Achievement Division and the Ontario Association of Deans of Education (Research Monograph #53),* Ontario Ministry of Education.

Craft, A. (2005). *Creativity in schools: Tensions and dilemmas*. London: Routledge.

Cremin, T., Burnard, P., & Craft, A. (2006). Pedagogy and possibility thinking in the early years. *Thinking Skills and Creativity, 1*(2), 108-119.

Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P., & Howe, A. (2013). Creative learning environments in education—A systematic literature review. *Thinking Skills and Creativity*, *8*, 80–91. doi:10.1016/j.tsc.2012.07.004

Dewey, J. (1934). *Art as Experience*. Rahway, NJ: The Barnes Foundation Press.

Eisner, E. (1994). *The Educational Imagination: On the Design and Evaluation of School Programs.* New York: MacMillan College Publishing Company.

Franklin, J. (2015, January). *Creativity as Humanizing Force*. Paper presented at the Interdisciplinary Colloquy to Understand Creativity, Toronto: University of Toronto, Faculty of Music.

Friesen, D. (2015, January). *Two Improvised Performances – with Commentary.* Paper presented at the Interdisciplinary Colloquy to Understand Creativity, Toronto: University of Toronto, Faculty of Music.

Fullan, M. (2013). Great to Excellent: Launching the next stage of Ontario's education agenda. Retrieved at http://www.edu.gov.on.ca/eng/document/reports/FullanReport_EN_07.pdf

Gallas, K. (1994). *The languages of learning.* New York, NY: Teachers College Press.

Gardner, H. (1993). *Multiple intelligences: The theory in practice*. Basic books.

Glück, J., Ernst, R., & Unger, F. (2002). How creatives define creativity: Definitions reflect different types of creativity. *Creativity Research Journal, 14*(1), 55-67.

Gonen-Yaacovi, G., de Souza, L. C., Levy, R., Urbanski, M., Josse, G., & Volle, E. (2013). Rostral and caudal prefrontal contribution to creativity: a meta-analysis of functional imaging data. *Frontiers in human neuroscience*, *7*.

Graff, Nelson (2011), "An Effective and Agonizing Way to Learn": Backwards Design and New Teachers' Preparation for Planning Curriculum. *Teacher Education Quarterly.* Vol. 38(3), pp. 151-168

Grazer, B. (Producer), & Howard, R. (Director). (1995). Apollo 13 [Motion Picture]. United States: Universal Pictures.

Hennessey, B., & Amabile, T. (2010). Creativity. Annual Review of Psychology, 61,569- 598.

Herman, J. L. (2004). The effects of testing in instruction In Susan H. Fuhrman & Richard F. Elmore (Eds.), *Redesigning Accountability Systems for Education* (pp. 141-166) New York, NY: Teachers College, Columbia University.

Heyning, L. (2011). “I can’t sing!” The concept of teacher confidence in singing and the use within their classroom. International Journal of Education & the Arts, *12*(13). Retrieved June 21, 2013 from http://www.ijea.org/v12n13/

Herbert, A. (2010). *The Pedagogy of Creativity*. New York, NY: Routledge.

Horng, J. S., Hong, J. C., ChanLin, L. J., Chang, S. H., & Chu, H. C. (2005). Creative teachers and creative teaching strategies. *International Journal of Consumer Studies, 29*, 352–358.

Johnson-Laird, P. (1988). Freedom and Constraint in Creativity, in Robert Sternberg (Ed.). *The Nature of Creativity: Contemporary Psychological Perspectives*. New York: Cambridge University Press.

Jorgensen, E. (2003). *Transforming music education*. Bloomington, IN: Indiana University Press.

Kaufman, J. (2009). *Creativity 101 (The Psych 101 Series).* New York: Springer. Kozbelt, A., Begheuo, R.A., & Runco, M.A. (1990). Theories of Creativity. In M.A. Runco and R.S. Albert (Eds.,). *Theories of Creativity*. (pp.20-47). New York: Sage.

Lehrer, J. (2011). *The New Yorker* Retrieved November 2014, from Steve Jobs: "Technology Alone Is Not Enough": http://www.newyorker.com/news/news- desk/steve-jobs-technology-alone-is-not-enough

Lewis, E. (2015, January). Being Creative in the 21st Century. Paper presented at the Interdisciplinary Colloquy to Understand Creativity, Toronto: University of Toronto, Faculty of Music.

Lichfield, J. (2005) The Moving of the Mona Lisa, The Independent. Retrieved from http://www.independent.co.uk/news/world/europe/the-moving-of-the-mona-lisa- 6149165.html)

Lin, Y. (2011). Fostering Creativity through Education—A Conceptual Framework of Creative Pedagogy. *Creative Education , 2* (3), 149-155.

Mears, Emilie L. (2015). Educating for the Twenty-First Century: A Pragmatist's View on the Dichotomy of STEM and Liberal Arts. *Master of Liberal Studies Thesis.* Paper 65.

Miller, John (2007). *The Holistic Curriculum* (Second Edition). Toronto, ON: University of Toronto Press.

Moldoveanu, M. (2015, January). Creativity = Integrative Thinking. Paper presented at the Interdisciplinary Colloquy to Understand Creativity, Toronto: University of Toronto, Faculty of Music.

Monk, A. (2015, February 17). *What Goes Behind the Creative Process* [Video file]. Retrieved from https://www.youtube.com/watch?v=hzcEwKodTDs

Moore, A. (2004). *The Good Teacher: Dominant Discourses in Teaching and Teacher Education.* London: RoutledgeFalmer.

Nezvadal, F. (2003). The standards testing movement: Equitable or excessive. *McGill Journal of Education, 38*(1), 65-78.

Nussbaum, M. (2010). *Not for profit: Why democracy needs the humanities*. Princeton, NJ: Princeton University Press.

Olivera, Monica (2013). "Let's hear it for STEAM – not just STEM – education." *NBC LATINO NEWS*. Retrieved June 21, 2013 at http://nbclatino.com/2013/06/19/lets-hear- it-for-steam-not-just-stem-education/

Ontario Ministry of Education. (2009). The Ontario Curriculum Grades 1-8: The Arts. Retrieved from http://www.edu.gov.on.ca/eng/curriculum/elementary/arts18b09curr.pdf

Oreck, B. (2004). The artistic and professional development of teachers: A study of teachers' attitudes toward and use of the arts in teaching. *Journal of Teacher Education , 55* (1), 55-67.

Pink, D. (2006). A *whole new mind: Why right-brainers will rule the future*. New York, NY: Riverhead Books.

Pio, F. (2007). A response to Cathy Benedict, "Naming our reality: Negotiating and creating meaning in the margin." *Philosophy of Music Education Review*, *15*(2), 69-71.

President's Committee on the Arts and the Humanities. (2011). *Reinvesting in Arts Education: Winning America's Future Through Creative Schools*. Washington, DC: Government Printing Office.

Reamer, A. C., Ivy, J. S., Vila-Parrish, A. R., & Young, R. E. (2015). Understanding the evolution of mathematics performance in primary education and the implications for STEM learning: A Markovian approach. *Computers in Human Behavior*, *47*, 4-17.

Richford, N. (2010). Intellectual development in the stages of early childhood. Retrieved January 07, 2011 from http://www.ehow.com/about_5048270_ intellectual-development-stages-early-childbtjod.html

Rinkevich, J. (2011). Creative Teaching: Why it Matters and Where to Begin. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 84*(5), 219- 223.

Roden, I., Kreutz, G., & Bongard, S. (2012). Effects of a school-based instrumental music program on verbal and visual memory in primary school children: a longitudinal study. *Frontiers in psychology*, *3*.

Robinson, K. (2006). Sir Ken Robinson: Do schools kill creativity. TEDTalks. Retrieved from: http://youtu.be/iG9CE55wbtY

Rosso, B.D. (2011). *Creativity and Constraint: Exploring the Role of Constraint in the Creative Processes of New Product and Technology Development Teams*. Ann Arbour: The University of Michigan: Doctoral Dissertation.

Runco, M. A. (2014). *Creativity: Theories and themes: Research, development, and practice*. Elsevier.

Schön, D. A. (1983). *The reflective practitioner: How professionals think*. London, UK: Arena.

Schön, D. A. (1987). *Educating the reflective practitioner*. San Francisco, CA. Jossey- Bass.

Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. Leadership Quarterly, 15(1), 33-53.

Shelov, S. and Altmann, T.R. (2009). Caring for your baby and young child: Birth to age 5, Fifth Edition. Washington, D.C: American Academy of Pediatrics.

Silvia, P. J., Martin, C., & Nusbaum, E. C. (2009). A snapshot of creativity: Evaluating a quick and simple method for assessing divergent thinking. *Thinking Skills and Creativity, 4*(2), 79-85. doi:10.1016/j.tsc.2009.06.005

Simon, R. (1987). Empowerment as a pedagogy of possibility. *Language Arts, 64* (4), 370-382.

STEMEducationCoalition http://www.stemedcoalition.org/

Tarbert, K. (2012). Learning Literacy through Music. Oneota Reading Journal. Retrieved September 16, 2014.

Tencer, D. (2017). 85% Of Jobs That Will Exist In 2030 Haven't Been Invented Yet: Dell. *The Huffington Post*, July 14, 2017. Retrieved at https://www.huffingtonpost.ca/2017/07/14/85-of-jobs-that-will-exist-in-2030-hav en-t-been-invented-yet-d_a_23030098/

Tuhiwai Smith, L. (2006). *Decolonizing Methodologies: Research and Indigenous Peoples*. London, UK: Zed Books.

Vartanian, O. (2015, January). *Neuroscience of Creativity*. Paper presented at the Interdisciplinary Colloquy to Understand Creativity, Toronto: University of Toronto, Faculty of Music.

Wearing, J. (2015, January). *Tasting Wild Mushrooms: Creativity and Learning*. Paper presented at the Interdisciplinary Colloquy to Understand Creativity, Toronto: University of Toronto, Faculty of Music.

Winner, E., T. Goldstein and S. Vincent-Lancrin (2013), Art for Art's Sake?: The Impact of Arts Education, Educational Research and Innovation, OECD Publishing.

Woldt, A.L. (2009). Gestalt Pedagogy – Creativity in Teaching. *Gestalt Review*, *13*(2). pp. 135-147.

Wu, J. J. (2004). Recognizing and nurturing creativity in Chinese students. In S. Lau, A.N. N., Hui, & G. Y. C. Ng, (Eds.), *Creativity: When East meets West*. Singapore City: World Scientific.