creativity, innovation and wellbeing

edited by

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2018 International Conference on
Knowledge, Innovation and Enterprise
Host Country: USA

Thematic Sections/Tracks:

Knowledge
Including teaching & (e-)learning in primary, secondary and higher education, knowledge-education, knowledge management, comparative knowledge, indigenous knowledge, Knowledge transfer partnerships, knowledge utilisation, intellectual property, library & information, Knowledge and technology

Innovation
Including business innovation, ICT/technology innovation including big data, analytics and deep learning, and management/organisation innovation and open innovation

Creativity
Including traditional themes/concepts of creativity—process, product, personality and environment; business/organisational creativity, arts, media & digital creativity, creative industries & enterprise, digital design & architectures, craft & animation, creativity in science and technology

Enterprise
Including entrepreneurship, marketing & strategy, HR, talent & development, servant/leadership in enterprise, SME business finance & accounting, business analytics, supply chain management, international business & management & family business/ethnic minority entrepreneurship

Creativity, Innovation
and Wellbeing

Guest Editor
Fredricka Reisman, PhD

2017 KIE Conference Publications:

Creativity, Innovation and Wellbeing
Research Papers on Knowledge, Innovation and Enterprise Volume V

Suggested Citation:
Gareth, H. & Wilson, C. (2017). From transcendence to general maintenance: Exploring the creativity and wellbeing dynamic in higher education, in Reisman, F. Ed., *Creativity, Innovation and Wellbeing*. London: KIE Conference Publications. Available online at: http://www.conference.kiecon.org/publications/ [or insert your university repository url]

Creativity, Innovation and Wellbeing

KIE Conference Publications

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Carol Nemeroff is a Social and Behavioral Sciences professor at the University of Southern Maine. Her professional training and experience spans Clinical and Health Psychology and includes 16 years as core faculty in the Clinical Psychology Doctoral program at Arizona State University. Her research focuses on the impact of magical thinking in daily life, particularly the influence of the "intuitive contagion concept" on interpersonal and risk perceptions, and health-related behaviors. Her publications are wide-ranging, from eating disorders and HIV prevention to the nature and origins of magical thinking to cognitive-emotional barriers to public acceptance of recycled water.

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Chris Wilson works in the Centre for Learning Innovation and Professional Practice at Aston University, a globally renowned higher education institution and the UK's leading university for business and the professions. He is a classically trained musician and practitioner in the technological arts with degrees in music and philosophy, has presented and published internationally on the subjects of creativity, artistry, technology and education, including the book *Making Projects Sing: A Musical Perspective of Project Management,* and is a Senior Fellow of the Higher Education Academy. With over two decades of teaching experience in higher education and expertise across a range of subjects, Chris has managed the delivery of staff development and professional recognition programmes at leading UK universities, lead institutional level projects including implementation of learning and teaching strategy, and currently leads a number of teacher education projects working to promote creative practice in higher education.

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Christine Galib is a doctoral candidate at Drexel University and director of Entrepreneurship and Wellness Programs at The Village School, Houston, Texas, USA. After co-founding a successful investment management team on Wall Street, Christine Galib taught science, health & wellness, and yoga through Teach For America. A nationally certified Integrative Nutrition Health Coach and yoga teacher, Ms. Galib founded Plan My Plate, a health & wellness consulting firm offering workshops on diet and exercise, stress management, mindfulness, and meditation. Ms. Galib has given presentations on wellness in corporate, hospital, and university settings, and teaches classes on mindfulness and meditation at Rice University's Susanne M. Glasscock School of Continuing Studies. Ms. Galib also serves as the Director of Curriculum and Instruction at Bridges to Wealth, a social enterprise closing the wealth gap through teaching business literacy, entrepreneurship, and investing. Ms. Galib is thrilled to serve as Director of Entrepreneurship and Wellness Programs at The Village School. She holds her A.B. from Princeton University and M.S.Ed. from the University of Pennsylvania Graduate School of Education, where she serves as an instructor. She is pursuing her EdD in Educational Leadership and Management, with a concentration in Creativity and Innovation, at Drexel University.

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David Paterson is the Programme Leader for the BSc(Hons) Audio Engineering degree at the Perth College campus of the University of the Highlands and Islands in the UK. He holds a BSc degree in Audio Engineering and a Masters in Education. David has extensive music industry experience and has collaborated in many successful projects over twenty-five years as an engineer and producer. He has industry recognition as a producer winning UK best blues album and a nomination in the prestigious Mercury Music Prize. As an academic, David's interests are in developing and nurturing creativity within a studio environment amongst musicians and his students. He is exploring the development of possible frameworks that encourage creativity that can be adapted by both musicians and sound designers. He has also researched into the pedagogical benefits of remote audio connections between distant campuses. He is exploring the development of possible frameworks that encourage creativity that can be adapted by both musicians and sound designers.

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Franck Zenasni is a professor in psychology at Paris Descartes University and Director of studies in Economy and Psychology Master at Paris Descartes University-Paris Pantheon-Sorbonne. His research topics are focused on creativity, gifted population, emotional intelligence and quality of life.

Fredricka Reisman

Fredricka Reisman, PhD, is a K-8 mathematics education specialist. She has taught at the elementary, middle school, high school and university levels. Her professional focus is diagnostic teaching of mathematics employing a heuristic, creative problem-solving approach in contrast to the linear medical model of diagnose-prescribe-remediate. In fact, the underlying philosophy of Drexel's Teacher Preparation Program which she created is heuristic diagnostic teaching, an interactive meld of learner characteristics, content knowledge and pedagogy knowledge. Dr. Reisman is an accomplished researcher, author and presenter and successful grant recipient of approximately $13 million dollars. Before coming to Drexel, she worked with E. Paul Torrance at the University of Georgia where she was Chair of the Division of Elementary Education. She and Dr. Torrance completed three books with Scholastic Testing Service, publisher of the world-renowned Torrance Tests of Creative Thinking, entitled *Solving Mathematics Word Problems Creatively, Learning and Using Place Value Creatively,* and *Learning and Using Primes, Fractions and Decimals Creatively.* Dr. Reisman, has received federal, state, and private foundation funding to strengthen teachers' mathematics and technology skills. She was the internal evaluator for Drexel's NSF funded integrative engineering curriculum, headed the Drexel project management team in 1983 to integrate computing into instruction in Philadelphia high schools, and served as the learning theorist and evaluator for Drexel software design and development in 1984, when Drexel was the first university to require incoming freshman to have access to a computer. She studied video disc production at the American Film Institute in Hollywood, CA. For three years, Dr. Reisman has co-taught the mediation course in Drexel's School of Law providing the creativity content. She was selected to receive the 2017 Torrance Award from the Creativity Network of the National Association for Gifted Children.

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Gareth Hughes is a psychotherapist and the Research Lead for Student Wellbeing at the University of Derby. Derby is a Gold rated university in the Teaching Excellence Framework (2017) and is in the Top 20 for teaching quality in the UK, according the Times Higher Education league tables. It is also recognised as a leading university in developing and providing support for student wellbeing. Gareth has a nationally recognised presence in the field of student wellbeing and has published and presented internationally on issues related to student wellbeing, academic anxiety, student transition, the role of student services and the links between wellbeing, learning and academic performance. He has been extensively quoted in national media. Gareth also teaches and lectures – delivering on Derby's psycho-education programme and as a tutor at the Human Givens College.

George G. Moker

George G. Moker is co-founder of the creativity and innovation (CI) program at Suffolk University. In addition, he is co-chair of the university's CI Steering Committee, as well as serving as Director of Entrepreneurship Programs and Instructor of Management and Entrepreneurship. Over the past decade, George has served on undergraduate and graduate curriculum committees, encouraging the expansion of creativity and entrepreneurship at all academic levels, as well as across all schools. He developed courses in creativity and innovation, entrepreneurship, in addition to interdisciplinary courses across the university's Law School, College of Arts & Sciences, and the Sawyer Business School. George is currently an EdD student at Drexel University (concentrating in creativity and innovation), and earned his MBA from Suffolk University. In addition, George is founder of a CPA consulting firm specializing in government-funded research firms with a commercialization focus.

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Hansika is Research Author at the Department of Psychology, Monk Prayogshala, Mumbai, India. Having completed her Master's degree in Clinical Psychology, she is currently pursuing her PhD from IIT, Bombay, India in the area of creativity. Specifically, her thesis explores the measurement, facets, and process components of negative creativity through behavioural and electrophysiological methods. She is a practising psychologist and a passionate researcher, striving to improve the academic environment in India. Her research interests lie in cognitive science and social psychology.

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Maliko-Abraham is a graduate of Drexel University's Ed.D. in Educational Leadership program. She holds a concentration in creativity and innovation. She has over 15 years of experience working as a Human Factors Specialist with both the Federal Aviation Administration and the Department of Homeland Security where her area of expertise was the study of human machine interactions. She is currently working towards her Licensed Professional Counseling (LPC) certification, where she plans to specialize in the use of creative therapies in career counseling.

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James C. Kaufman, PhD, is a Professor of Educational Psychology at the University of Connecticut. An internationally recognized leader in the field of creativity, he is the author/editor of more than 26 books, including Creativity 101 and the Cambridge Handbook of Creativity. Kaufman is the president of American Psychological Association's Division 10, which is devoted to creativity and aesthetics. He is the founding co-editor of Psychology of Popular Media Culture and co-founded Psychology of Aesthetics, Creativity, and the

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Jessica Cellitti is a PhD candidate with research interests focusing on pre-college engineering in urban public schools. Before entering the PhD program at Drexel, she taught math and science in grades K-12 in New Jersey for nearly a decade. She designed STEM elective courses on topics ranging from civil engineering and astrobiology to robotics. Jessica has two bachelor's degrees in Elementary/Special Education and Psychology. While teaching she also pursued a Masters degree in Science Education as well as a Master's degree in Curriculum and Instruction in STEM Education as part as NASA's Endeavor Fellowship Program.

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Katherine Boutry, PhD, is a tenured professor of English and the Creativity Studies Director at West Los Angeles College, California, USA. Dr. Katherine Boutry received her PhD in English at Harvard University where she taught for ten years and served as the Assistant Director of Undergraduate Studies. She created the MFA Program at Mount Saint Mary's University, and is the author of *The West Guide to Writing*. She is a creativity consultant for both schools and businesses, as well as a produced television writer.

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Larry Keiser is the Executive Director of Special Projects, Communications & Administration for Drexel University's School of Education. He has been with Drexel 32 years in various positions with a focus throughout on new program development, obtaining externally funded projects, and developing partnerships with Philadelphia organizations and schools. These programs, projects and partnerships promote alternative preparation pathways of K-12, STEM teachers, provide professional development toward school leadership improvement; enhance pre-service and in-service teachers' and elementary/ secondary students' mathematics and science content knowledge; better incorporate appropriate technology into the K-16 teaching and learning process; and promote creativity and innovation in schools, the workplace and in life. Larry presents nationally and internationally on the need to infuse creativity and innovation into K-16 education. He serves as adjunct instructor in the School's Creativity and Innovation Program for courses on the Foundations of Creativity.

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Lori Severino, EdD, is an Assistant Professor in the School of Education at Drexel University. Prior to her work at Drexel University, she taught in public education in special education for 26 years. During her tenure in the public school system, she taught students with reading disabilities, specifically dyslexia. Dr. Severino is a certified Wilson Language Trainer and was instrumental in bringing Wilson Level 1 certification to Drexel's Master of Special Education program and the Reading Specialist certification. Currently, she is working with faculty from the school of education and biomedical engineering to create a reading comprehension app for adolescents that uses fNIR technology to ensure the questions to the reading passages are text-based, an important factor with the new common core standards. Dr. Severino offers professional development training for teachers on topics such as reading and writing instruction for struggling students, differentiated instruction, and working with students with emotional behavior disorders. She was an invited speaker on differentiated instruction in the content areas at the Pennsylvania Branch of the International Dyslexia Association. She spoke on the same topic at the International Division of Council for Exceptional Children in Braga, Portugal. Dr. Severino has presented at numerous conferences both nationally and internationally.

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Michael Brown

Michael Brown is the Programme Leader for the BA (Hons) Music degree programme within the School of Arts, at the University of Derby in the UK. He holds diplomas in Art and Music, a BSc (Hons) degree in Software Engineering, Mathematics and Music, and a Master 's degree in Contemporary Composition, which combine to serve his interest in computer creativity. He is a researcher within the school with over twenty-five years of teaching experience, an active artist, composer and musician. His principal research interest is in the area of creativity; he has collaboratively investigated relevant theories and developed applicable strategies, in relation to the Arts and particularly Music, for implementation professionally and educationally. He has over the past few years explored a variety of related strands of investigation and has disseminated his findings on multi-modal creativity in Europe and the USA where he is an active member of the American Creativity Association. Ostensibly his core objective is to assemble a body of work that constitute a *toolkit* of applicable creative approaches that serve to offer insight into the creative process and potentially help to cultivate environmental conditions within which creative ideas may be more forthcoming.

Penny Hammrich

Penny Hammrich, PhD, is a Professor in the School of Education at Drexel University specializing in Science Education and also the Associate Dean of Academic Affairs and Graduate Studies in the School of Education. In the past 20 years she has been the Principal Investigator on over 35 research grants totaling over 30 million dollars, and has published extensively. Dr. Hammrich's research has been nationally recognized over the years by such organizations as the American Association of University Women, Association of Science Teacher Education, National Science Foundation, U.S. Department of Education and National Public Radio.

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Peter Lennox, PhD, is a Senior Lecturer at the University of Derby, teaching and researching in auditory perception and spatial psychoacoustics. He has a background in the oil industry, heavy engineering, corrosion engineering, and theatre and film production. He has lectured at University of York, Bretton Hall, Sheffield Hallam University, and the University of Derby. He held the post of Director of the Signal Processing Applications Research Group (SPARG) at the University of Derby from 2003 to 2010. His has special interests in the philosophy of the scientific study of perception.

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Tara Grey Coste, PhD, is a Leadership and Organizational Studies professor at the University of Southern Maine. Her research focusses on deliberate creativity and innovation in multicultural, multinational environments, with a particular emphasis on work in larger corporate enterprises and communities in Africa and Asia. This work aims to refine the training processes that enhance creativity in teams and to provide professionals tools that will allow professionals to enhance their global leadership abilities. She has published numerous articles and presented her work at venues around the world. She is a Colleague of the Creative Education Foundation, a Visiting Scholar at Singapore Management University's Wee Kim Wee Centre for Cultural Studies, and Past-President of the American Creativity Association.

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Todd Lubart is a Professor in psychology at Paris Descartes University, France. Professor Lubart is the Director of Laboratoire Adaptations Travail-Individu at Paris Descartes University. His research topics are focused on creativity, specifically individual differences, the identification and development of creativity on children, and the creative process.

CREATIVITY, INNOVATION AND WELLBEING: MOVING ALONG A CONTINUOUS TRAJECTORY

The UK Government defines wellbeing as 'a positive state of mind and body, feeling safe and able to cope, with a sense of connection with people, communities and the wider environment' (DoH, 2009, p. 18).

At the heart of this definition are two main approaches to wellbeing, hedonic and eudaimonic; the former is experience, pleasure and happiness (Davis, 2009; McMahan & Estes, 2011), or a 'feel-well factor'; the latter is functioning (Ryan & Deci, 2001). Hedonic and eudaimonic, to all intents and purposes, are subjective wellbeing even though eudaimonic may relate to 'experiences that are objectively good for the person' (Kagan, 1992 in McMahan & Estes, 2011, p. 4).

Yet, a salient assumption in this definition is economic condition, positive economic condition, which is a significant feature and measure of objective wellbeing. Objective wellbeing is associated with standard of living which is linked to financial status or material wealth of individuals (see Huppert et al., 2005, 2008; Smith & Clay, 2010; Ivković, et al., 2014). Subjective wellbeing, as already indicated, is about quality of life, a 'feel good factor' (see, also, Smith & Clay, 2010; Kapteyn et al., 2015).

So, whatever our philosophical approach or approaches to the conceptions of wellbeing, hedonic or eudaimonic; or our constructions of it, objective or subjective, what is evident are nuggets of empirical works that link creativity and innovation with wellbeing. Let's go back in time.

In 1926, British social psychologist Graham Wallas outlined four stages involved in the creative process—preparation, incubation, illumination, and verification. Wallas' Four-Stage Model of the Creative Process in *The art of thought* wasn't about wellbeing, but the model has over the years provided a basis for successive works on creative process and subjective aspects of wellbeing. Recent studies by Baas et al. (2008), Davis (2009), Bujacz et al. (2014) among others have reported associations between hedonic wellbeing and creative process and between eudaimonic wellbeing and creativity. A similar work by Fujiwara et al. (2015) found correlation between creative occupations and 'higher levels' of wellbeing.

We also know from the work of Frolova & Novoselova (2015) that emotional creativity (Averill, 1999) is a function of individuals' wellbeing, be they adults or children. The latter study followed a similar research by academics in New Zealand, which examined a link between creativity and emotional wellbeing. The researchers (Conner et al., 2016) asked 658 participants

to keep daily records of their activities and the impact of those activities – positive or negative – on their emotions over a 13-day period. The researchers found a higher level of wellbeing and creativity among those participants who engaged in creative activities. Four years earlier, research by Burt & Atkinson (2012) established a link between creative craft hobbies such as quilting and wellbeing. Similar evidence that involvements in creative crafts have positive effects on general wellbeing were documented in Warner-Smith & Brown (2002), Collier (2011), Bailey & Fernando (2012), and Pöllänen (2015).

We also have evidence that link innovation with wellbeing. A study by Paul Dolan and Robert Metcalfe of the London School of Economic and University of Oxford respectively, found evidence of correlation between innovation and subjective wellbeing specifically among individuals working in creative environments (Dolan & Metcalfe, 2009).

Nationally in the UK, the work of the National Endowment for Science, Technology and the Arts (NESTA), on behalf of the UK Government, has shown that wellbeing can be a requisite measure of national innovation performance (NESTA, 2008). The same wellbeing metric could be applied to any other major economy.

Regionally, at the European level, a Deloitte (2016) survey on innovation and wellbeing provide some evidence about public perceptions about innovation's link with wellbeing. In this survey, the Europeans did not only favourably perceived innovation, but also believed that it plays a vital role in improving their wellbeing.

Fast-forward to right now. The collection of papers in this volume are varied and diverse, but continue the same trajectory, a trajectory of providing further evidence of creativity's and innovation's links with wellbeing.

So, on behalf of the KIE conference family, I say thank you to everyone who has contributed to this book; special thanks to Dr Fredricka Reisman for her sterling work in editing the book. Special thanks also to Dr James Kaufman, whose commentary on the chapters nicely rapped up the book.

James Ogunleye, PhD, FRSA
Chairman, 2017 KIE Conference
Convenor, E. Paul Torrance International Roundtable on Creative Thinking
Convenor, Reisman Diagnostic Creativity Assessment Special Interest Group

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2017 KIE-ACA *BEST PAPER RECOGNITION AWARDS*

The Best Paper Recognition Awards are presented to the individuals judged by the *Creativity Experts Panel* of the *KIE International Advisory Board* to have written the best papers appearing in the annual KIE creativity volume. The award criteria are: (a) broad interest, b) clear and scholarly presentation, c) APA format, d) research or essay focus, d) scholarly presentation). The following authors received KIE-ACA 2017 *Best Paper Recognition Awards*:

1st (tie)
Gareth Hughes & Chris Wilson (University of Derby, UK & Aston University, UK respectively): From transcendence to general maintenance: Exploring the creativity and wellbeing dynamic in higher education.

Hansika Kapoor & Anirudh Tagat (Monk Prayogshala, Mumbai, India): How Happy is a Creative Country? A Country-Level Analysis of Creativity and Subjective Well-Being.

3rd
Katherine Boutry (West Los Angeles College, USA): "Creativity Takes Courage" The Link Between Creativity Programs and Student Well-being in the Urban Community College.

On behalf of the KIE Conference International Advisory & Review Board and its collaborating partners, American Creativity Association (ACA), and Drexel/Torrance Center for Creativity and Innovation, Drexel University, I extend my congratulations to all the winners and I say a big well done to all the authors and co-authors in this volume.

James Ogunleye, PhD, FRSA
Chairman, 2017 KIE Conference

Acknowledgement
Creativity Expert Panel & Awards Judges
Fredricka Reisman, *PhD*, President, American Creativity Association Drexel University, USA & Professor Emeritus, Drexel University, USA
James Kaufman, PhD, In-coming President, American Creativity Association & a Professor of Educational Psychology at the University of Connecticut, USA
Larry Keiser, Treasurer, American Creativity Association & Director of Special Projects & Certification Officer, Drexel University, USA
Gerard Puccio, *PhD,* Department Chair and Professor, International Center for Studies in Creativity, Buffalo State University of New York, USA

Collaborating Partners:
American Creativity Association**,** Drexel/Torrance Center for Creativity and Innovation, Drexel University

INTRODUCTION

FREDRICKA REISMAN

The 2017 KIE Conference Book entitled *Creativity, Innovation and Wellbeing* represents a conference collaboration among KIE, the American Creativity Association (ACA), The Drexel-Torrance Center for Creativity and Innovation, and the Drexel University School of Education. The authorship of the Reisman et al chapter is comprised of the conference panel for this year's annual RDCA SIG, which acknowledges the Reisman Diagnostic Creativity Assessment, a free app that may be downloaded via itunes. This conference characterizes another milestone, the passing of the ACA presidency from Fredricka Reisman to James Kaufman who will be installed at the Torrance Lecture event. Philadelphia, Pennsylvania, the seat of the creation of the American constitution, is the first KIE conference site in North America.

Themes that underlie the book content focus upon wellbeing, bring attention away from deficits to strengths (e.g., away from physical and cognitive weaknesses to emphasis on creative strengths), emphasis on specific disciplines (e.g., science, music, autism, dyslexia and dyscalculia), higher education, and creative organizations. This following discourse provides a brief overview of the chapters.

Hughes and Wilson offer an extensive treatise that addresses student physical, social, psychological, and academic wellbeing at the university level. Reisman, Maliko-Abraham, Keiser, Severino, and Connell provides a break away from the traditional deficit approach for individuals with autism spectrum disorder (ASD), dyslexia and/or dyscalculia to integration of creativity theories and practices upon which to build instruction. Dr. Boutry's insights regarding the need and creation of the Creativity Lab at her community college springs from her unique history of teaching both at Harvard and West LA, each for ten years. Her focus on positives rather than challenges of her students is parallel to the move away from the traditional and fading medical deficit approach. The Hammrich, Cellitti, Donaldson authorship present a scholarly mix of theory, research and suggested pedagogy, using the preparation of science teachers as their vehicle for creating a creative breakthrough in teacher education. Coste and Nemeroff present a scholarly sharing of unique magic related laws such as the *Law of Contagion*, which holds that something that has been in contact with another thing may influence it through the transfer of some or all of its core properties, via a transmissible essence. Three other laws embellish this unique presentation. Kuan-Chen Tsai investigates

personality traits, cognitive style, and artistic creativity among Chinese college students. Hansika Kapoor and Anirudh Tagat offer a comprehensive summary of creative organization variables followed by a cutting edge research study. Quarrie points out the relation between creativity and wellbeing as symbiotic in that they have the power to significantly enhance one another with the purpose of enhancing individual's lives. Brown, Paterson and Wilson discuss the creation of new ideas investigating creative motivation, constraint, development and outcome. In addition, they describe post-production within which pre-existing recorded materials are subject to creative arrangement, re-arrangement and processing. Wilson, Lennox, Brown and Hughes deal with creativity in higher education in relation to the reality of training for jobs that await the graduates. Moker describes in detail his participation in designing and implementing an undergraduate curriculum emphasizing creativity and innovation across two colleges. Galib shares her wonderfully described journey from Wall Street analyst to teaching science in a Texas charter school. And finally, James Kaufman, incoming president of the American Creativity Association, captures the essence of the book.

CHAPTER ONE

FROM TRANSCENDENCE TO GENERAL MAINTENANCE: EXPLORING THE CREATIVITY AND WELLBEING DYNAMIC IN HIGHER EDUCATION

GARETH HUGHES & CHRIS WILSON

ABSTRACT The issue of wellbeing in higher education has been an increasing area of discourse and action in recent years, driven considerably by increasing rates of recorded mental illness and apparent reductions in student resilience. With increasing recognition of the wellbeing challenge faced by the whole academic community, it is now incumbent on universities to move beyond deficit model support frameworks, to balance the necessary and essential challenge of study in higher education with the need for therapeutic effective interventions capable of engaging students and staff. There is a growing body of evidence relating to the health benefits of participation with creative activity, and engagement with creative experiences. This chapter presents a focused review of the creativity-wellbeing-learning dynamic to explore the possible opportunities for a move beyond the mere provision of supplementary student support. Given the increasing significance attached to creativity as a graduate attribute, the answer to the wellbeing challenge may be to question the notion of academic and therapeutic as being mutually exclusive ideals. Shouldn't effective academic challenge improve wellbeing? Might the challenge actually provide the solution?

Introduction

This chapter considers the relationship between creativity and wellbeing and their impact on learning in higher education. Seeking to identify creative ways of supporting the development and maintenance of wellbeing and a better understanding of the relationship between wellbeing and the realisation of creativity, the work presents an analysis of the development of an integrated university level approach to this field of activity.

There are three key aspects of wellbeing of relevance in this chapter related to the individual, the organisational, and the social:

1. Individual wellbeing and personal creativity
Firstly, with respect to the wellbeing of learners, there has been growing concern in western Higher Education about an apparent reduction in the wellbe-

ing of students, increased mental illness and lowered personal resilience (HEFCE, 2015). Recent research suggests that this may be coupled within an apparent reduction in some types of psychological creativity, such as the ability to visualise multiple possible futures (Hughes, Massey & Williams, 2017). Whilst much evidence suggests that in response to this, universities should move beyond reactive, deficiency models of support to embedded development, there is concern that consumerist and mechanistic approaches to higher education are driving opposite behaviours.

The challenges to wellbeing of 'Student Transition' into higher education (Kift & Nelson, 2005; Kift, 2009) have been well-established considerations in universities for many years, and have led to considerable changes to pedagogic practice in some institutions (notably in Australia). Nevertheless, the doubling of reported mental health conditions in the UK student population (Dandridge, 2015) provides a stark indication of the challenge at hand. Development of creative capacity and maintenance of wellbeing through university study requires navigation and coordination through a complex array of logistical, personal, and educational challenge and noise.

Positive psychology has identified that learning, challenge and creativity are key factors in maintaining positive wellbeing (Seligman, 2011; Dweck, 2017). There is also a growing body of evidence relating to the health benefits of participation with creative activity, and engagement with creative experiences in terms of the development and maintenance of personal wellbeing (Dolan & Metcalf, 2012; Conner et al, 2016).

2. Organisational wellbeing and creativity
Secondly, there are also strong indications of the wellbeing challenge extending beyond the student body into wider academia. Regularly recognised as amongst the most stressed professional groups (Kinman and Wray, 2013), research also indicates that academic staff at lower ranking universities in related league tables, have correspondingly lower wellbeing (Bothwell, 2017), whilst surveys routinely indicate excessive working hours and challengeable contexts for creativity or productivity. In an increasingly metrics driven environment of high stakes accountability, the autonomy and personalization of purpose so necessary for motivation and 'drive,' (Pink, 2011) would seem to be under some strain in higher education. Equally, in studies of organizational wellbeing, respondents have in some surveys identified being 3.5 times more likely to be encouraged to be creative and innovative where organizational wellbeing is identified as a priority (Dornan, 2010: 8).

Correspondingly, there is a parallel and dichotomous empathy challenge in any discussion of wellbeing in higher education. By definition, those involved in academia tend to be self selectively and evidently those capable of surviving and thriving in a HE environment. It's obvious why some academics may not be able to empathise straightforwardly with any students who find university study overtly challenging, because they clearly did not, or at least the vast majority will have succeeded in that context with many framing

their understanding of student experience through decades of academia, and memories of a potentially very different HE.

3. Social wellbeing and creativity

Thirdly and finally, there remains the challenge of determining the fundamental purpose of higher education, the future it serves, and the extent to which responsibility is and should be placed on educational systems in general for fostering and developing the social good, and by implication social wellbeing. The impact of universities is measured in a variety of ways broadly aligned with generalised conceptions of wellbeing. From the emerging Teaching Excellence Framework (TEF) in the UK, to wider ranking systems and evaluative metrics employed throughout global HE systems, the extent to which universities transform life chances, stimulate economic opportunity, and impact positively in local communities, are increasingly significant measures in the determination of a university's value and success.

Nevertheless, the simple conception of universities, and indeed all educational institutions, as agencies for social good, or as batteries or drivers of local and regional creativity, is far from universal; there being competing pressures and demands placed on all educational systems to perform to a wide range of different interpretations of impact and success. Equally, given the establishment of projects such as the Working Group on Mental Health in Higher Education by Universities UK (UUK), designed specifically to improve the mental health and wellbeing both of students and staff in higher education, the increasing focus on mental health and wellbeing in public health initiatives, and related wellbeing challenge outlined in this section, there is scope to consider more carefully the extent to which wellbeing is either something to be mindful of on the margins of educational experience, or something more fundamental to the culture and ethos of educational systems and practices.

This chapter presents a focused review of the creativity-wellbeing dynamic to explore the possible opportunities beyond mere provision of supplementary student support. It will question the apparent dichotomy between academic challenge and helping students maintain good wellbeing and suggest that supporting students to develop their creativity in terms of thoughts, behaviours and activity, alongside deep learning and academic challenge, could lead to better wellbeing for academic communities as a whole.

Defining Wellbeing

The term, 'wellbeing' is in itself a nominalisation; i.e. a verb that has become a noun ('being well' to 'wellbeing'), that appears at first glance to have a clear definition but which in effect holds no fixed meaning and so subject to different interpretations (Griffin & Tyrell, 2003).

As a result, a number of competing definitions of wellbeing can be found in the literature, each emphasising slightly different aspects of the hu-

man condition (Sen, 1999, Harsanyi, 1996, Seligman, 2011). That is not to say that wellbeing, in itself, is not a real thing, that it does not exist or that it is not worthy of study, it is simply that it is difficult to draw clear, crisp boundaries around such a holistic and broad-based part of human experience. People are well or ill, flourishing or stagnating, fulfilled or leading lives of quiet desperation. These experiences are all real and some of them individually measurable but they are shifting, malleable and subject to individual perception (Seligman, 2011).

For that reason, rather than attempting to devise a complete definition of wellbeing, it is important to establish clear working definitions and outlines for each separate discussion or study, such as this one, recognising that other definitions or frameworks may be more appropriate at other times.

Possible definitions of wellbeing

For the purposes of this chapter, a number of definitions are relevant:
Stiglitz, et al. (2009), in their report on measuring economic performance and social progress, drew attention to the differences between objective wellbeing and subjective wellbeing. Objective Wellbeing (OWB) they stated encompassed concepts such as health, social connectedness, education and freedom to pursue goals, while Subjective Wellbeing (SWB) related to perceptual evaluations of life happiness and satisfaction.

A number of authors have used forms of SWB in investigating the relationship between creativity and wellbeing (Dolan & Metcalfe, 2012). Broadly, this version of wellbeing is derived from a combination of how a person currently feels over a period of time and how satisfied or happy they are with their life overall (Kahneman, 2004, Layard, 2005). Dolan & Metcalfe (2012), argue that SWB has been validated against neurological, physiological and behavioural evidence and that it is therefore a strong indicator of actual wellbeing.

Seligman, (2011), and the positive psychology movement, however, believe that there are weaknesses in this formulation. Specifically, Seligman points to the fact that perceptions of life satisfaction are largely determined by current mood and suggest that the measure is therefore weak and lacking validity. He argues instead for a more holistic, generalised view of wellbeing that encompasses clearly defined and measurable elements - Positive emotion (of which happiness and life satisfaction are all aspects), Engagement, Relationships, Meaning and Achievement (PERMA). Of particular interest to this discussion, of wellbeing, creativity and Higher Education, is that it is easy to map each of these elements against student life. Studying at university should provide ample opportunity to find Engagement (learning), Meaning and Achievement, student life should provide opportunities to create positive relationships and all of this should therefore contribute to positive emotion. The fact that much of the evidence suggests that this is not happening is therefore both concerning and suggests that something has gone badly wrong.

The New Economics Foundation also presented a 5-item conceptualisation of wellbeing based on an examination of evidence from the field that

echoes much of the work of positive psychologists. In this formulation, good wellbeing requires individuals to:

- Connect   To be engaged in positive relationships and with their community

- Be active   To be physically exercising and moving

- Take notice   To be engaged and aware of the world around them and of their own experiences

- Keep learning   To challenge and stretch cognitively by engaging with new learning and discovering new things

- Give   To help others

Needs Theories

Needs theories offer another way to consider wellbeing. Although the field owes a considerable debt to Aristotle, most needs theories largely build on the work of Albert Maslow (1943) and his original conceptualisation of underlying human needs. In this view, all human beings share the same underlying needs. These needs occur across all cultures, although the ways in which people meet their needs will be culturally and individually specific.

There are a number of alternative models of what these needs might be, although many of these models strongly echo each other and many of the differences appear to be of emphasis, language and number (e.g. Glasser, 1985; Lazarus, 1997). Deci & Ryan, (1985), suggest that these needs represent evolutionary motivations that can be grouped under the headings of autonomy, competence and relatedness. Griffin & Tyrrell (2003) have expanded on these groupings to produce a framework of nine psychological needs. Their belief is that when these needs are met in balance, (alongside physical needs) human beings flourish and have good wellbeing.

These needs are:

1. Security
2. Autonomy and control
3. Status
4. Privacy
5. Competence and achievement
6. Meaning
7. Attention
8. Intimacy
9. Connection to wider community

Our Definition of Wellbeing

There are clearly echoes and similarities between all of these accounts of wellbeing. For the purposes of this chapter (and for our work at The University of Derby) we draw on this work to formulate a holistic framework in which to think about Student Wellbeing specifically. Students are in the midst of a unique life experience and as we shall see, their interaction with academic learning has particular impacts on their wellbeing – and vice versa. For that reason, it is necessary to construct unique models for student wellbeing and the underpinning phenomenon, in order to better understand what is going on and to provide a basis for designing effective interventions.

This model considers student wellbeing as being composed of four linked and interacting domains – physical (biological), psychological, social and academic, and reflects on the impact of each of these domains for student learning and performance.
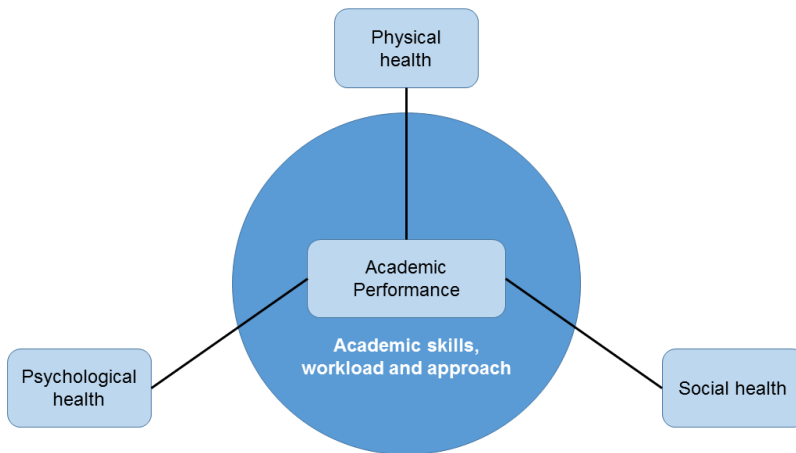
Figure 1 - Bio-psycho-socio-academic view of academic performance

Physical Student Wellbeing

Numerous studies have demonstrated that physical health and wellbeing has an immediate and real impact on student learning and performance. Sleep (Nagane, Suge, & Watanabe, 2015), hydration (Pawson, et al. 2012), exercise (Rasberry et al., 2011) and access to sunlight, (Heschong, Wright, & Okura, 2002), have all been shown to have clear effects on how students feel and perform. Exercise has also been shown to reduce anxiety and raise mood (Archer, 2016) and clear links have been demonstrated between food and mood (Quehl, et al, 2017) and sleep and wellbeing (Tang, et al, 2017).

Psychological Student Wellbeing

There is clearly strong support, among the authors identified above, for there being a strong psychological and emotional component to wellbeing. This is particularly the case for students, as lowered psychological wellbeing significantly impacts on student learning and experience. British government data demonstrates that students with a declared mental illness tend to underperform compared to their peers (Equality Challenge Unit, 2014). The work of Joseph Le Doux (1996), has also shown that heightened negative emotional arousal – specifically anxiety and fear, will reduce cognitive functioning, thereby reducing student learning and performance.

When considered more positively, new learning, challenge and being stretched can also positively enhance student wellbeing. Good wellbeing, in turn, can lead to better learning and performance. An important factor in this is that learning can induce what Csikszentmihalyi (1998), has called flow – an enhanced mental state of performance and creativity.

Key to understanding this element is being clear about the difference between these two states. While learning and achieving flow require a certain amount of challenge, this is not the same as stress or anxiety. Griffin & Tyrrell (2003), class this as stress vs. stretch, as there are in fact two different neurological processes behind these phenomena; Stress reduces cognitive function, stretch boosts it.

Social Student Wellbeing

Cacioppo & Patrick, (2009) have demonstrated that social isolation and loneliness also reduces cognitive function, academic performance, creativity and problem-solving ability. The field of social neuroscience has clearly established that human beings need connections to others and many authors have argued that learning has a significant cultural component. Studies of student transition into university have also shown that this transition is significantly influenced by the levels of socialisation students experience (Hughes & Smail, 2014), and Tinto (2013) has argued that for students to succeed they must socially integrate into their university. Students who are isolated are therefore more likely to underperform or withdraw from university much less be creative in their learning.

Academic Student Wellbeing

Postareff, (2016; Postareff, et al, 2016) and others have shown that the ways in which students engage with their learning can have an impact on their wellbeing and performance. Specifically, students who engage in deep learning appear to have better wellbeing, perform better and have a better experience. Students who engage in surface learning have lowered wellbeing and

specifically higher anxiety, lower performance and enjoy their experience less. The key difference between these two groups appears to be motivational focus, with deep learners having a more intrinsic motivation and surface learners a more extrinsic motivation (Deci & Ryan, 1985).

The implications of this model

The main implications of this model are that student performance derives largely from a student's physical, psychological and social wellbeing, which is filtered through and mediated by their academic approach, skills and amount of effort exerted, to produce their overall academic performance. If any aspect of a student's wellbeing is reduced, this will have a negative impact on their performance, which students will have to compensate for (e.g. by working longer) or absorb (i.e. accept lower grades), with further consequent negative effects on their wellbeing. However, this also means that there are multiple steps students can take, on all four of these axes to improve their performance. For instance, students who are underperforming may wish to exercise more, sleep better and seek a better social balance, as a means of improving their energy levels, motivation, ability to concentrate and think creatively, thereby improving performance.

This clearly suggests an interlinked, transactional relationship between all aspects of wellbeing and learning, which, therefore means that universities who wish to improve the performance and \ or wellbeing of their students, must consider taking more holistic approaches.

There are numerous factors that are significant in supporting or facilitating effective learning. Race (2014: 39) identifies seven key factors for successful learning:
1. Wanting to learn;
2. Needing to learn;
3. Learning by doing;
4. Learning through feedback;
5. Making sense;
6. Verbalizing orally;
7. Learning through assessing.

The key is to develop approaches to ensure that mechanisms to support student learning and development, as well as curriculum and pedagogies, align effectively to enable each factor to flourish. Helping students to engage with creativity to deepen their learning and boost wellbeing, offers one such promising holistic approach.

Wellbeing and Creativity

There are a number of ways in which creativity and wellbeing have clear correlations, and others with less distinct, but arguably more intriguing potential

for discovery and understanding.

The Creativity \ Illness Myth

The relationship between wellbeing and creativity is a much-debated topic (Abraham, 2015). Public attention has often been drawn to depictions of the 'mad genius' (Dietrich, 2014) or to tales of the tortured artist, alone in a garret toiling through cold, starvation and mental illness, much like characters in the works of Merger (2008) or Gissing (1980).

A number of authors in the field have attempted to draw links between creativity and a vulnerability to mental illness (e.g. Carson, 2013) but many of these studies have attracted significant criticism for being methodologically unsound (Schlesinger, 2009; Dietrich, 2014). Whilst it is undoubtedly true that some eminent artists have had difficulty with their psychological wellbeing, many successful creative people do not experience mental illness and the vast majority of people who experience serious mental illness are not successfully creative and productive, certainly not while they are ill (Kaufman & Paul, 2014; Ramey & Chrysikou, 2014). The problem with the triumph over adversity model for exemplary creativity is that it is selective and presuppositional.

In addition to this, as Csikszentmihalyi (2013) points out, creative work involves two distinct stages. Others have identified these stages as divergent (the generation of multiple new thoughts and ideas leading to a 'Eureka' moment) and convergent (the drawing together, whittling down and applying of these insights) (Mednick, 1962). The subjects in Csikszentmihalyi's work point out that in the convergent phase, realising an initial idea and turning it into something that exists in the world, outside of the imagination, requires long hours of focussed, hard work. This is not something that is easy to achieve if the creator is ill, tired, hungry or in pain.

Kaufman & Paul (2014) suggest that some of the attention on the concept of the 'mad genius' may be caused by the fact that, for some people, their experience of psychotic symptoms may produce a particularly original way of viewing the world – much like the theory that, Monet's later paintings were the result of seeing the world through cataracts (Marmor, 2006). This originality causes their work to receive greater attention, so distorting our view of the field.

Nevertheless, whilst the premise that creativity emerges from adversity is clearly challengeable as typical experience, there remain too many examples of remarkable ingenuity and inventiveness born out of crisis for these to be ignored out of hand. Needs driven creativity such as that which followed the communication of the famous words, "Houston, we have a problem" in the case of the 1970 Apollo 13 mission, can represent amongst the most remarkable peak states of human ingenuity. Perhaps recorded more routinely because of remarkable and dramatic narrative—the classic triumph over adversity trope—whilst illness or adversity themselves do not produce creativi-

ty, they can nevertheless be contexts of remarkable creative endeavour.

Positive wellbeing and creativity

The great proportion of evidence actually indicates that, for the vast majority of the population, creativity and wellbeing exist in a positive relationship with each other (Daly, et al, 2014; Dolan & Metcalfe, 2012; Kaufman & Paul, 2014; Wright & Pasco, 2014; Csikszentmihalyi, 1992), whilst some (Humes, 2011) argue for a more critical approach to the subject by highlighting the very different interpretations both of 'creativity' and 'wellbeing' in different subject contexts.

Dolan & Metcalfe (2012), for instance used an enormous data set derived from the British Household Survey to demonstrate a positive relationship between creativity and subjective wellbeing that appears to work in both directions - good wellbeing boosts creativity and creativity seems to benefit wellbeing.

Indeed, when considering the role of creativity, against the various models of wellbeing discussed earlier, it is easy to see why active engagement in creative tasks can boost wellbeing. Creativity can provide opportunities for learning, achieving and creating meaning.

Some researchers have also found that engaging in creativity can help individuals' process potentially difficult thoughts and emotions in ways that can support good wellbeing (Ramey & Chrysikou, 2014; Smith, 2017). When confronting difficult problems, the ability to use the imagination creatively is key to being able to productively reframe the difficulty, generate possible solutions and visualise a time beyond the existence of the current problem (Griffin & Tyrell, 2003). Indeed, much of Dweck's work (2017) has established that this ability to visualise a time in the future, when an individual and their circumstances have changed, is key to future persistence, resilience and growth.

In many ways, being able to visualise a different future is the basic act of creativity. It is the ability to visualise that brought us out of the caves and lead us to create cities, the internet and Spongebob Squarepants. Being able to maintain this ability helps us to maintain motivation, seek solutions and overcome problems. As Bobby Kennedy used to say at the end of campaign speeches, "Some men see the world as it is and ask 'why?' We see the world as it could be and ask, 'why not?'" (Schlesinger, 1978). It is this ability to foresee what is 'not yet,' that provides much of our meaning, motivation and resilience and is key to our wellbeing.

When viewed from the opposite perspective, it is also easy to see why good wellbeing would be more likely to generate productive creativity. A positive, relaxed mind is more likely to be able to draw on all of its cognitive abilities to generate new ideas (Le Doux, 1996, Goleman, 2005). Creativity demands energy, enthusiasm and dedication (Csikszentmihalyi, 2013). There are also suggestions that a high level of productivity may also increase the

quality of an individual's creativity, meaning that having the physical and mental reserves to keep working is vital for someone to reach their creative potential (Ramey & Chrysikou, 2014).
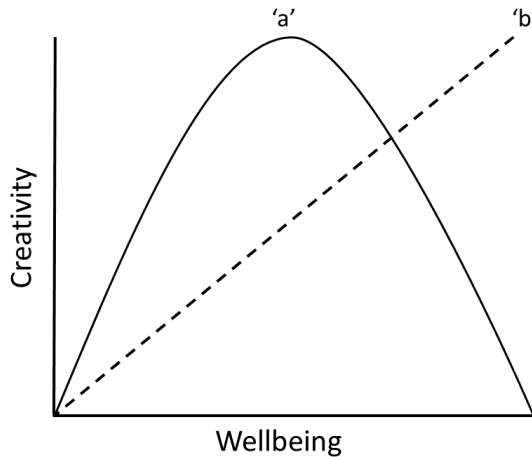
Figure 2 – Possible relationships between creativity and wellbeing

As discussed in Wilson & Brown (2015), both the potential for creativity and subsequent perception of creative authenticity and value can be influenced by the circumstances of creative activity. Considering Figure 2 above, one might argue for a general bell curve of creative potential afforded by circumstances or needs with a conceptual 'sweet spot' ('a') balance between creativity and wellbeing more likely than a conceptual model of exponential increase in creative possibility in line with wellbeing ('b'). Remarkable needs-driven creativity can emerge from almost impossible circumstances but these are perhaps exceptions to the norm rather than representative examples of typical creativity. Equally, however, considering the notion of peak wellbeing, one might question the driver for creativity and innovation if context reflects ideal circumstances. Where wellbeing is 'perfect', creativity could inadvertently compromise or disturb the status quo and constitute a threat to wellbeing at least at the social scale, and motivational source to instigate change ultimately reduced overall.

To understand this, it may be necessary to separate individual and societal wellbeing. It is, for instance, possible for an individual to be in a state of good wellbeing but driven by the injustices of an ill society to create new and potentially disruptive challenges. In turn, this would provide meaning and purpose for the individual, which would underpin their own sense of wellbeing.

Creativity, Learning and Meaning - the point of Universities

Creativity, innovation and enterprise have been subject to increasing focus and attention in higher education, albeit with considerable ambiguity and uncertainty about the precise distinction between these terms, which are often used interchangeably and somewhat uncritically (Wilson & Lennox, 2013). Nevertheless, these are well-established tropes in universities whilst 'wellbeing' is a comparatively recent arrival in educational discourse and their overall relationship is subject to challenge in the literature (Humes, 2011).

Creativity and education now

At university level, learning and creativity should be obvious bedfellows. Each moment of learning is in itself an instance of small 'c' creativity, an act of personal change and growth (Kaufman & Beghetto, 2009). Nevertheless, from a distance, it would appear that our current education systems are largely the result of, what Daniel Kahneman (2012) would call, a 'substitution error.'

Robinson (2016) identifies the rise of the 'standards movement,' as being the key component that brought our current education culture into being, beginning in the 1990s. At that time, in the UK, the Labour Party were swept to power in a landslide election with a promise to focus on three priorities, 'Education, Education, Education.' Improving education was seen as the key to unlocking future growth and prosperity and to challenging inequality of opportunity (Blair, 2006). Eager politicians, policy makers and educators were, however, confronted with two complex and complicated questions – how do you improve education? And how would you know if your improvements had worked?

This is such a complex issue that there isn't even clear agreement about what education is for (Robinson, 2016). Much like the term wellbeing, 'education' is a nominalisation – it means many things to many different people. It might be suggested, for instance, that a good education should probably result in (among other things) a rounded individual, with good knowledge, the ability to respond to, analyse and solve problems, an ability to communicate effectively with others, who is ready to begin a job or career that will fulfil their potential and who can play a role an active citizen.

Whilst this may sound reasonable, it is difficult to measure and properly define. To an extent, it is really only possible to tell if an education system is working, several years after the current cohort have moved into the real world - there being an impact evidence delay effectively rendering real-time educational analysis as if communicating across the depths of space.

It is here, one can argue, that a substitution error appears to have oc-

curred. Faced with this complexity, those who were reforming the system seem, instead, to have looked to the measurements that already existed – namely exam results. There is some logic to this – if the education system is improving then it is reasonable to assume that exam results would improve as a result. So, the question became, not how do we improve education, but rather, how do we improve exam results?

As Kahneman (2012) demonstrates, the human mind has a preference for and will revert to simpler questions if at all possible and 'how do we improve exam results?' is clearly a much simpler question to answer and address, than 'how do we improve education?' The measurement of exam results leads to exam league tables, which were intended to drive improved performance. Unfortunately, as evidence from around the world demonstrates, a culture of performance management based on exam results, changes teaching practice and pedagogy in ways which are often unhelpful. (Hughes, Massey & Williams, 2017; Polesel, Rice & Dulfer, 2013; Reed & Hallegarten, 2003).

There is growing evidence that these innovations have, in fact, had a narrowing effect on education overall, as schools focus more and more on prolonged test training and less on fully rounded learning (Robinson, 2016). Teachers report key elements of learning and development being squeezed out of the curriculum, to focus on test performance. A number of researchers have shown that as this rise in exam focus occurred, thinking skills, resilience and the ability to generate new ideas has fallen, (Jones, 2010; Walsh, et al, 2013; IBM, 2008).

Walter Weyns, (2016) characterises this approach as 'pre-agreed goal acquisition,' as opposed to learning. Indeed, learning seems to have disappeared from much of the education narrative to make way for performance, attainment and results.

This is particularly noteworthy for universities. When universities were originally established in Bologna and Paris, most students did not graduate with a degree and the qualification is not what they paid for – universities did not sell qualifications, they sold learning (Ruegg, 1994). Similarly, Germany thrived post-unification in 1871, not because her universities gave out lots of certificates but because the learning they drove into society and the economy led to innovation and improvement.

The current narrative, however, particularly in the UK, is that students attend university to get a degree to get a job (Collini, 2016). The focus is on the qualification and the most efficient route for the student to get the piece of paper at the end of their course.
Robinson (2016) and others (e.g. Weyns, 2016) summarise all of this by suggesting that the problem is that policy makers have attempted to enforce a linear approach onto learning, which is an organic process that cannot successfully be made linear.

Alongside this, sits the marketization of higher education – which is itself a false premise, as the true conditions for a market can never truly exist,

particularly for undergraduate study. For a market to function the consumer must understand the product, understand the choice and be able to make a rational decision to select the best product for them. But what many students think they want pre-entry, is often not what they need and most don't understand the complexity of choice presented (Weyns, 2016; Hughes, Massey & Williams, 2017) – something many final years students recognise, once they reach the end of their degree. The only way the market could truly function, would be if students had the chance to do 4 initial undergraduate degrees in 4 different universities, at which point they would then be informed consumers, capable of making an informed choice.

Instead, many students arrive at university with unrealistic expectations, prepared only for passive, surface learning, focussed on pre-agreed goal acquisition and lacking many of the key skills they require to thrive in higher education (Hughes, Massey & Williams, 2017; Kift, 2009; Harvey, et al, 2006).

The result

The impact of these developments appears to be (in the UK at least) a drop-in student wellbeing overall, with a particular increase in student mental health problems (Brown, 2016; HEFCE, 2015; NUS 2015). While reports on student mental health differ in their exact findings, the numbers in all of them are worryingly large. A HEFCE report (2015) identified that student demand for support had increased by 150%, while in an NUS survey 83% of students believed they had experienced problems with their mental health while at university. Other authors have identified that students at university have a lower level of wellbeing than their matched peers (Reeves & Hillman, 2016). All of which has led at least one national newspaper in the UK to maintain a series entitled 'Student mental health crisis' (Guardian, 2017).

In addition, reports from academics and research in the field suggest that the focus on grades in schools has reduced students' ability to engage in deep, active learning (Grove, 2016). Rather than seeing each piece of academic work as a creative and intellectual endeavour in search of meaning, students have instead been trained to regard it as a necessary drill required for the production of a grade (Dorling, 2015).

In fact, there is good reason to assume that these two things are linked, given the lessons of Postareff's (2016) work. Not only do deep learning students have better wellbeing and generally perform better. Students who take a strategic, surface level approaches with extrinsic, grade focussed motivations are more likely to be anxious, to need the support of others to manage negative emotions and tend to achieve less.

As was pointed out above, the fact that so many students appear to be unable to maintain good wellbeing at university is particularly troubling because they are, in fact, surrounded by an environment that should support them to thrive. In most universities students are surrounded by all the re-

sources they need to meet each element of all of the frameworks for good wellbeing set out by Seligman, Griffin & Tyrrell, The New Economics Foundation and Stiglitz. That this is not happening can only be due to either external factors or the fact that students are simply unable to make use of these resources because of poor preparation and broad cultural training that has ensured they become distressed and ill.

All of this has given rise to discussions of student resilience and the need to address and improve the level of resilience students are able to call upon. There are currently a number of funded projects in the UK embarked upon developing 'tool kits' that universities can use to address this apparent deficit in their students (AMOSSHE, 2017).

However, this formulation is not without its critics, not least because the idea of resilience is also subject to ill definition and debate as to whether universities should actually be focussing on conceptions of 'grit,' 'character,' or 'emotional intelligence' (Seligman, 2011; Goleman, 2005). Indeed, much of the conversation surrounding this debate seems to actually be a discussion of student psychological and social health and wellbeing, rather than internal abilities and strengths (AMOSSHE, 2017).

If universities are to genuinely improve the resilience, wellbeing and learning of their students, we need a clearer, conceptual framework on which interventions and actions can be based. For this framework to be useful it must take account of the significant role that learning plays in the wellbeing of students to create a working model of 'Student Resilience.'
Thankfully, a significant amount of work has already been undertaken by a range of authors in the field to build better understanding of a many of the elements that contribute to student wellbeing and learning. However, many of the discussions of resilience do not seek to draw these elements together, in fact some seem to pit them against each other, rather than recognising them as being parts of the same thing.

The following section will outline our initial attempt to build a conceptual framework of 'Student Resilience,' drawing on a large amount of work undertaken by others, alongside our own small contributions to the field. The framework sets out a range of concepts on a spectrum from most negative to most positive. We propose that by deliberately designing interventions that help students move from negative to positive on the framework (or to maintain a positive position), universities can help students to improve their resilience, wellbeing and learning.

As Box noted (1979), all models are wrong but some are useful. We hope this framework may prove to be useful, while recognising its limitations.

A Student Resilience Framework

This framework is constructed using a series of interlinked concepts describing internal phenomenon and the impacts they can have on students. In each of the following sections we describe the most negative and most positive versions of each concept, however, we recognise that most students will exist on a continuum somewhere between these two extremes.

1. Mindset – performance as judgement vs learning as process
Dweck (2017) has written extensively on the impact of mind-set on academic learning and performance and on wellbeing. She positions the key difference as being between 'growth' mind-set and 'fixed' mind-set. Growth mindset allows for future development and ongoing improvement, while fixed mind-set tends to see attributes and skills as fixed and permanent – which therefore makes future growth impossible. (For instance, students who view intelligence as a fixed trait from birth that cannot be improved, are described as having a fixed mindset. Those who believe that their intelligence is something that can be developed over time are described as having growth mindset.)

In particular, she has looked at student self-perceptions and how they relate to learning and performance. Students with a growth mind-set will view their learning as an ongoing journey, with each assessment point an opportunity to identify progress and possible improvements. Students with a fixed mind-set will tend to regard their academic career as a series of assessment hurdles, each of which is a judgement of them as people. Because they do not believe their skills or abilities can improve in future, all assessment outcomes are forever. If a student fails one assessment, they are likely to label themselves as a permanent failure, rather than viewing the grade in context and seeking to learn from the experience.

Her work has also demonstrated that students who view intelligence as 'fixed' tend to adopt less effective learning practices, to be less curious about their own meta-learning and to have higher levels of anxiety. This bundling together of perception, learning and anxiety is an important phenomenon for which successful interventions must account. For students to be able to enjoy academic life and achieve to their potential, they must be helped away from the idea of performance as judgement and towards learning as an ongoing and rewarding process.

2. Deep learning vs surface learning
As was discussed above, a number of writers (Postareff, 2016; Postareff, et al, 2016; Donnison & Penn-Edwards, 2012; Dolmans, et al, 2016) have identified the importance of student approaches to learning both for academic achievement and their wellbeing. These learning approaches are broadly characterised as 'deep learning' and 'surface learning.'

In deep learning, students immerse themselves in their subject and the process of learning; they pursue increases in knowledge and understanding driven by positive emotions – enjoyment, fulfilment or passion. As part of deep learning they are likely to read and study more widely than directed, to seek debate with others about the issues they are studying and to make connections between their subject material and the wider world. Students who engage in deep learning tend to use assessments to deepen their knowledge and understanding and \ or to advance their own arguments and beliefs. In this way their learning creates and is driven by a search for meaning.

In surface learning, students focus on the minimum level of learning required to achieve their desired grade in the required assessments. As part of this, students will tend to concentrate on memorising facts over studying for understanding and will be guided by a search for the 'right' answer, rather than pursuing meaningful learning. As a result, students will tend not to read more widely than is absolutely necessary and will be motivated only by the eventual grade – or by their fear of potentially not achieving the grade they want or need. This drives these students to seek safety, avoid risk taking and fear being wrong, limiting their learning and turning their academic journey into an experience that is fraught with danger.

As has already been discussed, of particular interest to discussions of student wellbeing is the apparent finding that not only do deep learning students achieve higher grades, they also have better wellbeing overall. Students who engage in surface learning are more likely to be anxious and generally dissatisfied (Postareff, et al, 2016).

When considering these findings alongside Dweck's work, it is easy to pair deep learning and growth mind-set and surface learning with fixed mind-set.

3. Intrinsic vs Extrinsic Motivation

Implicit in all of these discussions is the focus of student motivations. Deci & Ryan's work (1985) classifies motivation as broadly breaking into two types. Intrinsic motivation describes those things that we do as the result of internal drivers – because they bring pleasure, fulfilment, engage our passions etc. Extrinsic motivation, by contrast, is driven by a search for external reward – admiration, status, pay, title, recognition etc.

Deci & Ryan state that while we are all influenced by a mix of intrinsic and extrinsic motivation, those who are mainly driven by intrinsic desires are more likely to be stable and fulfilled, while those who focus mainly on extrinsic desires are more likely to be anxious and dissatisfied. It is not hard to see why this would be the case. Extrinsic rewards lie outside of an individual's control, creating a greater degree of risk, more uncertainty and less genuine meaning. While, for the most part, barring disaster, meeting intrinsic desires remains within an individual's control.

This then maps to both Dweck's work and our understanding of student learning approaches. Students who are extrinsically motivated (focus on

grades) have been shown to be more likely to adopt surface learning approaches and are also more likely to have fixed mindsets.

Students who are intrinsically motivated, are more likely seek fulfilment through learning and therefore to adopt deep learning approaches and to have a growth mindset.

4. *Delayed gratification vs instant gratification*

Walter Mischel's (2014) work has demonstrated that the ability to delay gratification in children, is a better predictor of future wellbeing and success in adulthood than academic ability or intelligence. Those who need immediate short-term gratification and reward are less able to tolerate long periods of hard labour or to respond positively to adversity.

For undergraduate students, this means that rather than engaging in deep learning and risk taking in their first two years–which is more likely to lead to better understanding, growth and final degree classification – instead, students will focus on the immediate gratification of the next grade or praise. Working through uncertainty and doubt, without immediate reward will simply be beyond them.

That need for instant gratification, the 'mashing of the pleasure button,' as Linden (2011) has called it, has been shown to undermine wellbeing, reduce ability to manage negative emotions and increase risk of addictive behaviours.

Again, we can line this up with the discussions above – students who can delay gratification will be more able to learn deeply and a focus on intrinsic motivations and a growth mindset will allow them to overcome any adversity and maintain their own motivation, without the need for instant positive feedback.

5. *Positive personal narratives and complex visions of the future vs negative personal narratives and short term focus*

Smith (2017) and the narrative therapy movement (White & Epston, 2015) have reflected on the importance of our personal narratives in the creation of meaning and the maintenance of wellbeing. Individuals who have stable, flexible narratives about who they are and their place in the world, tend to have better wellbeing and are more able to derive meaning and strength from adversity. Crucially, these individuals tend to have realistic but positive views about their own strengths and their narratives can adapt to and survive being challenged by circumstances.

On the other hand, those with uncertain narratives, narratives that are overly positive or pessimistic and that are therefore, fragile and that cannot withstand challenge are more likely to have lower wellbeing.

In many ways, it is our narratives and expectations that shape our psychological responses to the world and our experiences – they guide what we chose to focus on and what we filter out.

Seligman (2011) has written about the importance of positive expecta-

tions of the future as a key element in this. However, many students do not appear to possess these strong, stable narratives and expectations of the future.

In research that Hughes has conducted with colleagues (Hughes, Massey & Williams, 2017), we found that many students in 6th form are apparently unable to visualise the future and had an immediate short-term focus only. Teachers report that their students are unable to conjure up, in their imagination, visions or narratives about what their future might be. This short-term focus extends to their approach to tasks – important long-term tasks are relegated below less important tasks that have shorter timelines. The effects of this were to create anxiety, due to the uncertainty about their future and the undermining of preparation for university- students were unable to see what they could do to prepare and did not take up offers of help as a result.

This connects to Mischell's work on gratification and its role in prioritisation. Students, who cannot focus on the longer term, will be less able to engage in deep learning that has longer term rewards and will focus instead on the short term immediate requirements that can be seen clearly.

6.   Socially confident, connected and comfortable alone vs socially anxious and vulnerable to isolation and loneliness

A significant number of writers have reflected on the negative impact that loneliness and social isolation can have on wellbeing. Pinker (2015) has suggested a role for social connectedness in extending life span, while Cacioppo & Patrick (2009) have identified that loneliness reduces immunity, impairs cognitive function and increases the risk of physical illness. Key to this phenomenon is the fact that the determining factor is not the amount of time that someone spends alone but rather their perception of themselves as being lonely – or not. As soon as someone 'feels lonely' the negative impacts begin. This again highlights the importance of personal narrative in determining wellbeing.

Of particular note for universities is the apparent finding that once someone feels lonely, the potential positive impact of any intervention is reduced. Helping students to avoid loneliness (but not time alone) is therefore an important consideration.

In other work conducted by Hughes with colleagues (Hughes & Smail, 2015), we identified that new students are predominantly focussed on socialisation during the first weeks of term. Students, who had socialised well, identified this as being an important factor in settling. Students who felt lonely identified this as problematic. This is supported by much of Tinto's (2013) work, which has highlighted the role of social integration in successful student transition into university.

However, some research, including our own, (Hughes, Massey & Williams, 2017) suggests that many students are arriving at university without the necessary skills to meet their social needs. This lack has the potential to undermine their sense of belonging, wellbeing and (given the impact of loneli-

ness of cognitive function) academic performance.

7. *Meet needs in balance vs cannot meet needs*

As discussed above, needs theorists posit the belief that distress occurs because individuals cannot meet their underlying needs in balance. The barriers to meeting these needs can be environmental, due to a lack of key skills or because of physical, genetic or psychological impairments.

From the discussion above it is easy to see how a fixed mindset, extrinsic motivation, an inability to properly consider the future and a need for instant gratification could act as psychological barriers to a student being able to meet their needs. In addition, a lack of social or academic skills could undermine their ability to meet social needs and their sense of competence and achievement.

Added to this, is a consideration of physical needs. As was outlined in Fig1 physical health also plays a role in academic performance as well as directly influencing psychological and social health. If students are unable to manage practical tasks such as balancing their time, sleeping well, eating healthily etc. then this too will impact on their wellbeing and performance. A tired, poorly fed and ill student will also have fewer reserves to draw upon in response to adversity.

Our research suggests that many students are not equipped to manage these responsibilities at the point of leaving school – partly because their inability to consider the future, means that they have not prioritised developing necessary skills.

These elements can then be seen to have specific outcomes for student behaviour, performance and wellbeing.

8. *Confidence and flow vs anxiety and procrastination*

A number of authors including Csikszentmihalyi (1992) have highlighted the importance of confidence and what he terms 'flow' for learning and creative thinking. Flow is defined as a state of complete absorption, in which people are able to perform at the peak of their abilities, delivering enhanced sense of purpose and wellbeing. Flow is also something that has to be worked for and requires a degree of sustainable challenge.

This clearly echoes research concerning deep learning – in many ways flow can be seen as a product of a deep learning approach.

In this way, we can see that students who are confident, have growth mind set, learn deeply and focus on the longer term can achieve flow, which in turn will improve performance and wellbeing.

Alternatively, students who are experiencing anxiety will find that their cognition is disrupted, concentration will be more difficult and they will have reduced access to their imagination (Le Doux, 1996). In this circumstance, academic learning is unlikely to enhance wellbeing and may in fact become a source of fear. Because fear is a form of pain and as humans we are programmed to avoid pain, students may then begin to avoid academic work – in

other words, to procrastinate.

This anxiety may initially be created by a schooling system that pushes students towards surface learning and perfectionism, fixed mind sets and extrinsic motivation.

However, research into anxiety also highlights that avoidance behaviours tend to increase anxiety over time (Griffin & Tyrrell, 2003), so that students can become locked in a self-perpetuating feedback loop of anxiety-procrastination-increased anxiety. Finding ways to break this loop for these students is therefore crucial.

9. Persist and overcome difficulty vs think about giving up

The Unite report into student resilience (2016) identified that emotional experience is a better predictor of whether or not students consider dropping out of university than demographic or academic data.

Many of the factors discussed above will have a bearing on this emotional experience and the ability of students to respond to adversity. A number of authors have reflected on the fact that the ability, to respond to set backs, requires a level of emotional literacy, self-control, the ability to self-sooth, reframe the current experience and fit adversity into a healthy personal narrative that takes a long-term view of the future (Goleman, 2005; Seligman; 2011; Mischel, 2014; Smith, 2017).

The responses of students to set backs (for this example we will use a student receiving a disappointing grade) can be broken down into the following process.
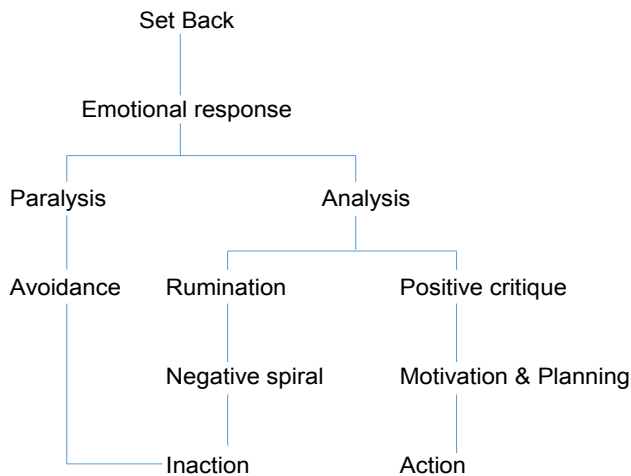

Figure 3. Student setback response process

The adverse event (the poor grade) will first produce an emotional response

(see fig 3). If the student regards this as natural and can accept the initial emotion, they will be more able to process the experience and self-sooth, without adding additional negative emotions, such as guilt.

Students who cannot process the emotion in this way, may find themselves experiencing layers of negative feelings and thoughts associated with failure, anxiety, guilt and despair.

Responses from here break broadly into two areas, Paralysis and Analysis, with Analysis breaking down into two further areas.

In Paralysis, students who have difficulty positively processing the experience, can adopt avoidant, 'freeze' related behaviour. They may attempt to push the set back out of their mind by distraction or self-medicating, are unlikely to use or read feedback provided by their tutor and may begin to avoid other academic work that reminds them of the poor grade they have received.

In Analysis, students will engage in thinking about what has happened, which, if negative, will lead to Rumination or if positive will result in Positive Critique.

In Rumination, students will focus on the negative aspects of what has happened, often with self-critical thoughts or thoughts about how others are to blame for their predicament. Students may add other negative experiences to their current setback to construct on overarching negative narrative that runs into their future, depriving them of the hope of future success. Rumination is recognised as being a thinking process that is key in maintaining depression (Griffin & Tyrrell, 2003).

Alternatively, in Positive Critique, students will accept and process their initial emotional response and focus on what they can learn. They may pay close attention to the feedback they have received or seek out tutors for further learning.

Rumination and Paralysis both lead to inaction (in terms of students taking positive steps) – there is no improvement in wellbeing or future performance.

Positive Critique leads to learning, increased control and better wellbeing.

10. Able to manage own emotions vs seek others to absorb negative emotions
These responses to adversity are further supported by the work of Postareff and her colleagues (2016 & Postareff, et al, 2016) have identified intriguing connections that suggest surface learners are more likely to need others to help them manage negative emotions. This is consistent with findings in some of our research that suggested that many students seek out authority figures to help them resolve emotional and practical difficulties (Hughes, Massey & Williams, 2017).

This is not to suggest that appropriate help seeking when necessary is a sign of weakness or a lack of resilience (in fact it can be the opposite). But if students cannot absorb normal, day-to-day ups and downs without relying on others to resolve their problems, it leaves them vulnerable and unable to feel

in control of normal experiences. This in turn can undermine their ability to take responsibility for their own behaviours and achievements, thereby impeding the possibility of future growth.

11. Engaged in creative thought and practice vs. creatively inhibited
As has been discussed above, academic learning and the production of academic work is essentially a creative process. Academic assignments at undergraduate level and above, require creative thinking to identify and solve problems, synthesise research, develop approaches to evaluating evidence and reach conclusions. Csikszentmihalyi and others have pointed out that even in professions not thoughts of as 'creative,' (e.g. engineering, biology.) a high level of creativity is required at the upper levels, to develop new ways of testing ideas and solving problems.

Students who are intrinsically motivated by their subject and who use their assignments to investigate issues about which they are passionate (learning deeply), will be more able to enter flow and engage creatively with their work. These students will also be more able to consider, experiment with and refine their own creative process, engaging with meta-learning and performance.

Students who are extrinsically motivated and engaged in surface learning, will instead seek the 'right answer.' This search for perfection is inimical to creativity, which is a process beset by uncertainty and messiness. By seeking the 'correct answer' students are less likely trust their own creative instincts and instead to seek other authority – "what does my tutor want me to say?"

This in turn is likely to create anxiety within these students, which as has already been discussed, will disrupt their thinking and performance.

Summary

This then provides a framework on which universities can focus developmental models of intervention. Support or education that seeks to move students from the Negative end of the spectrum towards the Positive (see fig 3) is likely to improve wellbeing, learning and long-term performance. The implications of this will be discussed further when we turn to changes that could be made to the Higher Education sector.

Negative -	+ Positive
Fixed Mind Set	Growth Mind Set
Performance as judgement	Learning as process
Surface learning	Deep learning
Extrinsic focus of motivation	Intrinsic focus of motivation
Instant gratification	Delay gratification
Limiting personal narrative	Empowering personal narrative
Short term, narrow focus and rigid expectations	Can visualise multiple possible, positive futures
Poor social skills – vulnerable to feeling isolated	Socially confident, connected and comfortable alone
Cannot meet needs	Needs met in balance
Anxiety and procrastination	Confidence and flow
Think about giving up	Persist and overcome difficulty
Seek others to absorb negative emotions	Manage own emotions
Creativity inhibited	Engaged in creative thought and practice
Seek safety	Seek meaning

Fig 4. Student resilience framework

The response of Universities

Provision of services

The typical response from universities, particularly those in the UK, has been to provide a range of services that students can access to address issues which may be having a negative impact on their wellbeing. These services differ in range and nomenclature from institution to institution but often include some

combination of health services, counselling services, financial support, Chaplaincies and disability services (HEFCE, 2015).

Much of this support has been predicated on a traditional, reactive 'deficiency based model' (Quinn, 2005; Harvey, Drew & Smith, 2006). Although some universities have sought to develop more proactive outreach interventions, these tend to be regarded as augmentations to the main support provided and often do not alter the structure or practice of the main body of the service.

Within the most traditional versions of this model, these services are made available for students to access themselves. Students become aware of them either through internal marketing, word of mouth or referral from some other part of the university (e.g. by a tutor or manager of their hall of residence).

For a student to actually receive this support, three criteria must be fulfilled.

1. The student must be able to identify that they need and may benefit from support. Many students normalise their experiences and are therefore unaware of the impact of anxiety, poor sleep etc. or blame themselves for their poor wellbeing or underperformance.

2. The student must be able to identify, understand and find the relevant service. Universities are often complex institutions with their own language and titles that can be difficult to navigate, particularly for students from non-traditional populations. In addition, research suggests that traditional forms of raising student awareness of support (e.g. induction talks are often ineffective) (Retention Grants Programme, 2010; Hughes, 2016).

3. The student must believe that the support might be able to improve their situation. It is a common feature of many phenomenon, such as depressed thinking, loneliness, academic anxiety etc. that the person does not believe anything can be done to help them (e.g. see Cacioppo & Patrick, 2009). Accessing a service may therefore seem to be a waste of time and effort.

Within the UK, universities have also placed significant focus on students who arrive with a declared need or vulnerability to withdrawal or underachievement, such as disabled students, care leavers or BAME students. In part, this has been driven by funding models and action to ensure social justice.

As an example of this, the Disabled Students Allowance is a funding package provided by government to support universities to make adjustments and provide long-term support to disabled students, to ensure that their disability does not unfairly disadvantage their academic learning and performance. This is based largely on a medicalized model and focuses on making allowances for the impact of a disability or providing support to overcome a 'deficiency,' e.g. providing a note taker for students with dyslexia, who might

otherwise not be able to take good quality notes of their own.

Government reforms have recently removed a proportion of this funding and universities have provided a range of responses to this – however, it is notable that many have chosen to simply fill the funding gap and maintain the same types of support on the same deficit model.

Problems

Although many students are undoubtedly helped by these services, national reports suggest that in many places they are under strain and subject to increasing critique (Brown, 2016). A number of reports have suggested that the rise of mental illness in the student population has overwhelmed resource, with waiting lists of up to 12 weeks, for counselling, in some universities (Marsh, 2017).

A number of voices have also suggested that a model which fixes a student's deficiencies, at the point of entry, as permanent and provides the same level of support for their entire academic career, rather than seeking to support the student to develop their own skills, strategies and resilience, is disempowering and unfair, as it does not prepare them for the world beyond education.

There is also a national acknowledgement that there is often a significant gap between Student Services and academic activity. Support professionals and academics often speak in different languages and in many universities, have little contact with each other (Hughes, 2016b). As a result, the support provided can seem divorced from the academic learning students are undertaking.

There is also a low level of research within the Student Services sector and little evidence of effectiveness or of variations of impact between services or approaches.

Personal Tutors

Alongside or as an alternative to the provision of services, many universities have or are reintroducing personal tutor schemes. In such schemes academics will be allocated a set number of students to 'guide and support.' While personal tutors are usually positioned as a source of academic guidance, there is often an explicit or implicit expectation that they will have a 'pastoral role,' towards their tutees.

Personal tutor schemes vary widely between institutions and the role is often subject to poor definition (McFarlane, 2016). Tutors may have no formal training in supporting students or in responding to specific student problems, such as mental illness (Luck, 2010; Gardner & Lane, 2010). Confusion about boundaries, the limits of their role and confidentiality are commonly identified as problems (McFarlane, 2016).

This can leave tutors in an unenviable position of feeling unprepared,

overwhelmed and unsure who they can or should turn to when presented with a difficult student problem (Luck, 2010).

Adaptations to teaching

A number of universities have also identified a desire to address some of these concerns by reforming teaching practice. In particular, there has been much debate about 'students as partners,' 'students as co-designers of curriculum,' and the introduction of discovery learning to replace 'the sage on the stage' (Kirschner, Sweller & Clark, 2006; Bovill, Cook-Sather & Felten, 2011)

However, as a number of authors have pointed out (Hattie & Yates, 2013; De Bruyckere, Kirschner & Hulshof, 2015), large scale studies have demonstrated that when discovery learning is used alone, it tends to increase inequality. Students who have received a sophisticated education already and who have been prepared for active learning, thrive with discovery learning. Students who have had a more passive education and who have not been equipped with the relevant pre-knowledge and skills, are unable to engage in the tasks and so underachieve.

This disadvantaging of the already disadvantaged, is likely to further undermine the wellbeing and learning of those students who most need support.

A potential future

As was stated above, creativity is, in part, the act of being able to see that which does not yet exist.

In this chapter, we will now take a creative leap, based on the discussions above, to picture how the Higher Education system could respond to the need to support student wellbeing and learning, through engagement with creativity and the creative process.

Professional Services and Academics

This chapter began by considering the apparent reduction in the wellbeing of students, increased mental illness and lowered personal resilience. Given the recentness of this phenomenon, it is clear that the root cause cannot be some form of genetic evolution. This problem is human made. It, therefore, can be fixed by human endeavour. Given the role of universities in educating their own students and the world, they are perfectly positioned to begin to make this change.

However, it should also be clear that traditional models of support are not capable of resolving this problem.

As was demonstrated above, student learning, lifestyle, mindset, skills and wellbeing are intricately interlinked. The wellbeing and learning of stu-

dents cannot be separated into neat departmental boxes - with academic tutors responsible for learning and professional services responsible for wellbeing. Such a model leaves to chance whether or not students discover and access the support they need. It also ensures that wellbeing interventions can be delivered without considering academic context and that academic learning and teaching can be delivered without considering the wellbeing of students. Thus, reducing effectiveness on both sides.

Clearly defined boundaries

Academics

Support professionals
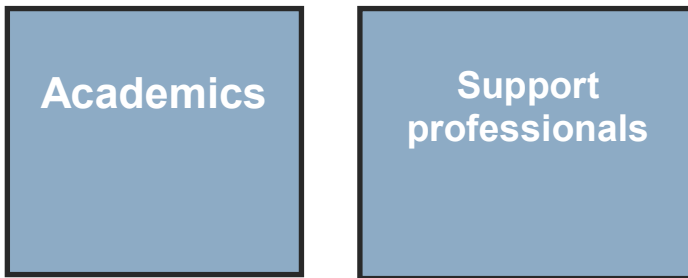
Create gaps students can fall into

Figure 5. Traditional relationship between student services and academics

In addition, if universities adopt this approach, then there is no holistic overview of the whole student experience.

Instead, universities must be remodelled to ensure a clear and consistent overlap between academic and professional services and between student learning and student wellbeing.

Overlap of interests, practices and principles focussed on learning

Academics

Support professionals
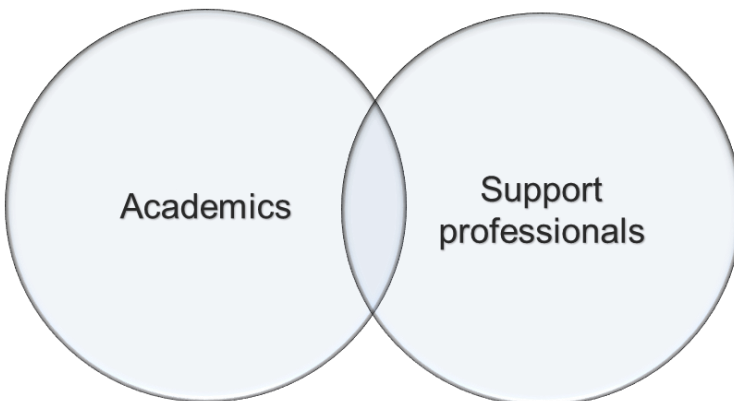
But still with clearly defined boundaries

Figure 6. Collaborative model of relationship between academics and student services

This is not to argue that there should be no boundaries between support professionals and academics. Clearly the content of counselling sessions must remain confidential between the counsellor and the student. A degree of guaranteed confidentiality is crucial to ensure services remain accessible - if students believe problems will be reported back to their academics, they will be less likely to access support.

It is simply that these clear boundaries should be positioned so that there is clear overlap, ensuring that students are engaged with their own wellbeing, understand the links between wellbeing and learning and have clear access to support if needed.

The Curriculum

The most obvious place for this overlap to take place is within the curriculum. The curriculum is the guaranteed space, which all students will encounter, and curriculum that supports wellbeing and learning, therefore, has the ability to impact on all students.

Following this logic, on the face of it, the simplest way to utilise the curriculum for this purpose, would be to ensure that all students attend classes that help them to better understand wellbeing and learning and to identify steps they can take to improve their own wellbeing. Indeed, a number of universities in the UK are seeking to adopt versions of this approach and in the US, some universities have used the First Year Seminar as an opportunity to do just this.

However, this approach, on its own, is likely to be ineffective. Research has shown that simply educating people about their health, does not lead to healthy behaviour change (Marteau, Hollands & Fletcher, 2012). Knowing what healthy behaviour looks like and how it can be achieved may be a prerequisite for healthy change but it does not guarantee change in itself - otherwise more people would eat 5 portions of fruit and veg' a day, exercise for 150 minutes a week and no one would smoke nicotine.

Instead, individuals must be emotionally motivated by deeper factors. As others have pointed out, the word 'motion' is in 'emotion' because they come from the same root word (Griffin & Tyrrell, 2003). Motivation for change grows from emotion that is engaged by meaning.

Creative learning

Drawing all of this together, we propose a curriculum that truly supports wellbeing and learning, based on our model for student resilience, using creativity as the key vehicle for growth.

We suggest that such a curriculum would help students to develop growth mind-set, intrinsic motivation and deep learning; it would provide students with a clear understanding of their own underlying physical and emotional needs and ways by which these needs can be met to boost learning;

it would support student socialisation and help students to develop new, more empowering narratives about themselves, their ambitions and their place in the world. Above all, such a curriculum would eschew grade gathering in favour of the development of meaning.

In this way, students would be able to develop their own skills and insights, as a natural part of their student experience, so that they can enhance and maintain their wellbeing, (no matter which model of wellbeing one adopts.

Key to this, we suggest, is helping students to move away from the narrative of academic performance, that seeks 'correct' answers and towards an approach to learning that is creative and meaningful. As has already been shown above, active engagement in creative endeavours enhances wellbeing overall. Creativity linked to learning, should therefore provide an ideal platform on which to improve student wellbeing.

What Do We Mean by a Creative Approach to Learning?

It is undoubtedly true that many educators may feel uncomfortable with the idea of learning being a truly creative endeavour. Academics in engineering, science or technology related subjects may object that their students cannot simply be loosely creative, they must instead, learn the rules and discipline of their subject with academic rigour. The calculations that determine how a bridge is built must be correct - they cannot just be creatively pleasing.

We do not deny this. However, Csikszentmihalyi (2013), amongst others, has written at length about the nature of the creative process. He identifies that creativity is almost always embedded within a rigorous discipline. Music, painting, dance and acting are all recognisable creative occupations and yet each is deeply rooted in practice, technique and language. Each discipline has its rules and each discipline is grounded in its own history. True moments of large C creativity are in part, at least, a response to learning that has gone before.

Indeed, neurological work by Heilman, Nadeau & Beaversdorf (2003), has identified that one of the three key elements that differentiate highly creative people from others is a high degree of specialist knowledge. Whilst it is of course true that a bridge must be built using the correct calculations, which does not mean that the engineering solution behind the bridge cannot be creative. The Clifton Suspension Bridge was an extraordinary feat of engineering; it was also a huge creative endeavour that pushed the bounds of engineering beyond what had previously been achieved. In conceiving the bridge, Brunel was able to visualise that which had not previously existed.

Therefore, we suggest that creative learning must be anchored firmly within each subject discipline. Supplementary learning that does not have a clear connection to the student's subject discipline, will lack relevance and meaning and will therefore be less effective. However, rather than learning simply for the sake of retaining valuable knowledge, students should be en-

couraged to learn for meaning and future application - and to consider how they might use this knowledge to create solutions yet unseen in the future.

To achieve this curriculum design will have to depart from, what Robinson & Aronica (2016) describe as, the mechanised, linear view of education. They argue that most education in the western world is predicated on a factory based model that sees an input of knowledge and an output of 'educated students.' However, many authors have identified that learning is a non-linear process (Weynes, 2016). Exposing students to facts in an apparently logical order does not guarantee increased knowledge, understanding or insight. Therefore, curriculum that is solely designed on this basis is clearly inadequate to the task.

It is for this reason that we argue for curriculum that is designed to deliberately develop students along our suggested model of student resilience (or something similar) but that does so, rooted in subject discipline.

To achieve this will require students to engage in forms of meta-learning. We suggest that this can be addressed by building an understanding of the principles of creativity and the creative process, as they relate to each specific area of study. A number of authors have attempted to describe the process of creativity and a number of competing models exist (although many contain overlaps and commonalities). For our purposes, it does not matter which model is adopted (and some may be more useful for some disciplines than others), providing they help students gain an understanding of certain key principles and that students are guided into adopting these principles as part of their learning process through practical application.

Kift's (2009) work on scaffolded learning and first year pedagogy provides clear guidance on how this can be accomplished. She argues that universities must make no assumptions about the skills with which students will arrive. If students need particular knowledge or skills to succeed within their discipline, then the curriculum design should ensure they can acquire these within their programme. To do this, academic programmes should adopt scaffolded learning, providing high levels of challenge coupled with high levels of support, that is gradually removed as students become more skilled and confident. Following this model, for each of the principles below we argue that students should receive explicit instruction and practical learning opportunities.

   1.   Delay answer finding

As has already been discussed, many students will seek correct answers as quickly as possible and may become uncomfortable or anxious if they cannot quickly find solutions. Therefore, helping students to understand that initial impulses are likely to be based on incomplete information, previous biases and incorrect assumptions is a key part of their learning. In relation to this, a number of participants in Csikszentmihalyi's (2013) work describe the need for creative individuals to be comfortable with 'not knowing' for a period of time.

2. Defining the problem and engaging emotionally

The redefinition of a problem can in itself be a creative and world changing act. The redefinition of disability as a medical problem to a social problem, lead to the opening up of significant new cultural and practical solutions for the difficulties faced by many disabled people. Helping students to slow down in their rush for an answer, to properly consider the phenomenon under consideration and to find their own definition for the problem - to design their own question - can increase understanding of their discipline and increase their sense of control. This can also support the development of growth mind-set and provide links from their subject to intrinsic motivation.

Defining their own question, will allow students to make an intrinsic emotional connection to each module of learning or piece of assessment. By engaging positive emotions with the problem, students will be motivated to seek solutions, rather than focussing on grade gathering.

3. Deepening knowledge

As has already been explored, creativity is embedded in discipline knowledge. However, true creative endeavour requires deep knowledge and understanding, to create the conditions for new thought to emerge. A surface retention of facts will not provide the deeper level of cognitive contemplation required to produce moments of insight.

Students should therefore be guided to understand their defined problems better by deepening their understanding of their discipline so that they are able to question, compare and evaluate the knowledge base of their discipline. This will allow them to identify inconsistencies in theory, poor quality evidence and cultural assumptions, thereby creating a space for new thought.

It is this which should guide student's research and engagement with learning, meeting their intrinsic needs, supporting growth mind-set and increasing their confidence within their own discipline.

4. Incubation and wellbeing to generate ideas and understanding

The generation of new ideas often relies on a period of incubation. New information must be embedded into long term memory, connected to old information and reorganised in the unconscious to allow new thoughts to emerge. For many students, this may feel like another period of 'doing little.' However, incubation also relies on appropriate self-management and numerous activities have been shown to improve incubation and thought.

Sleep, for instance, has been shown to play a crucial role in memory consolidation and problem solving (Cai, et al, 2009; Sio, Monaghan & Ormerod, 2012). Exercise, diet and positive motivation can also boost the brain's creative effectiveness (e.g. Raspberry, et al, 2009). Educating students in the importance of meeting their physical needs during the creative process, at the point when they may feel a need to find something they can do, to actively contribute to the furtherance of their learning, is likely to increase the likelihood of their acting and engaging in healthier behaviours.

This point in the process can also be used to help students to develop skills to manage negative thoughts and emotions that may block their learning and creativity - such as anxiety. In this way, students can develop a sense of mastery over their own emotions and lifestyle, increasing their confidence and self-belief and positively enhancing their own narratives.

5. Divergence

Deliberate, practiced divergence, the production of multiple ideas in response to a specific question, can enhance student imagination, enabling them to improve their ability to visualise a range of possible futures. Encouraging students to find multiple possible ideas can also help to wean students off the concept of 'eternal correctness' and away from paralysing perfectionism. Freed from the tyranny of needing to find the 'right answer' straight away, students will be more able to access flow states, that deepen learning and improve wellbeing overall.

The period of divergence can be aided by social learning, debate and open critique. This requires the creation of a safe social space in which to explore new ideas in a constructive way - new ideas, however valuable are vulnerable at conception and will perish in a harsh environment, even if they contained promising possibilities.

Helping students to develop the skills for supportive challenge (both to give and to receive), can increase their social literacy generally and thereby increase their social confidence.

6. Review and acknowledge development

Before students start to refine their ideas, they can be encouraged to review their progress so far, acknowledging the learning and growth that has taken place, any difficulties they have encountered and the journey still to travel. This can help student develop their self-reflection abilities, positively alter their personal narratives and contribute to growth mind-set.

7. Converge

Having developed a range of possible ideas, students can then be guided in the process of testing and evolving their thoughts. This is the period in which the application of hard work is required to develop ideas into a solid piece of work and as has previously been discussed, for students to negotiate this period successfully they must also maintain their wellbeing, ensuring their needs are being met in balance.

Inevitably, this converging period contains moments of disappointment, failure and doubt. Helping students to normalise this and develop skills to respond positively will increase their capacity to delay gratification and respond to adversity positively.

8. *Re-evaluation and further incubation*

Key to ensuring that students can manage this part of the process successfully, is ensuring that they recognise that this is still a period of learning - not solely one of production. Even at this late stage they can be open to new insights and eureka moments that transform their understanding. Staying focussed on the learning aspect here, will again keep them engaged in growth minded, intrinsic, deep learning activity.

9. *Refinement*

Finally, students can complete by refining their ideas - recognising that creative work is never complete, only abandoned.

Conclusion: Implications for Universities

This model also raises questions about aspects of higher education pedagogy and in particular approaches to assessment. Widely recognised as amongst the most inhibiting aspects of higher education study, with sanctions and often punitive measures imposed around assessment activity so as to maintain suitable rigour and notional parity of standards and fairness, universities should be encouraged to explore more diagnostic and ipsative assessment practices so as to focus on the development of individual learners and their creative potential. This would also serve to scaffold the experience of initial development in preparation for more traditional normative assessment experience.

In the introduction to this chapter we highlighted the focus of wellbeing at the level of the individual, organizational, and social. Traditional assumptions about education progress and development that focus on creativity as a phenomenon emerging late in higher education, if at all, need to be challenged. Rethinking Maslow's hierarchy of needs, simply placing consideration of creativity as basic or psychological need rather than a potential consequence of these needs being met in balance, can fundamentally transform conceptions of educational process and experience. Rather than hoping that creativity emerges over time, this might be the most effective starting point for any educational experience. After all, if students and academics within the academic community are confident in their creativity, resilience and wellbeing will undoubtedly follow. If creativity and wellbeing are fully developed, universities can perform more effectively as a power source for creativity and wellbeing in communities and society.

To deliver on this vision it is necessary for many universities to reconceptualise how they are organised. It would be unfair to expect many subject-based academics to be able to deliver on this model without relevant support. Most academics will not necessarily have the insight, knowledge or skills to develop or deliver curriculum on this model by themselves. Therefore, there must be closer collaboration between academics and professional services within the curriculum and in the classroom.

This requires a redefinition of the role of Student Services (or Student Affairs), to be more involved within teaching and learning providing clearer links into support services when they are needed and supporting academics to develop curriculum that supports wellbeing. This also highlights further value in the development of academic staff and student partnership working so as to develop the most effective lines of experience communication and adjustments for the personalisation of educational process.

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CHAPTER TWO

THE POWER OF CREATIVITY APPLIED TO FOLKS WITH AUTISM, DYSLEXIA AND/OR DYSCALCULIA

FREDRICKA REISMAN, HELENE MALIKO-ABRAHAM, LARRY KEISER, LORI SEVERINO & JAMES CONNELL

Applying creativity to autism and dyslexia and dyscalculia presents a positive approach to these disorders, moving away from the traditional deficit models which destroy one's self concept and self-efficacy. Research and pedagogy integrating creative enhancing strategies in concert with major creativity theories form the structure of this chapter. The material in this chapter provides a foundation in theories and practices dealing with creativity and innovation upon which to build instruction for individuals with autism spectrum disorder (ASD), dyslexia and/or dyscalculia. Remember, a disability need not be a handicap when instruction addresses a student's creative strengths and circumvents learning challenges.

Bedrock Theories of Creativity

Creativity is much more than artistic ability; it is a discipline with centuries of study. The distinction between creativity and innovation should be noted. Creativity refers to generating unique novel ideas. Innovaion is the implementation of these ideas. Following are major theorists in the field of creativity and innovation and a synopsis of their research contributions:

Graham Wallas (1858–1932)

Wallas' (1926) theory provides a structured approach to creative problem solving. In the Wallas stage model, creative insights and illuminations may be explained by a process consisting of 5 stages for creative thinking:

i.   Preparation – focuses on the problem and explores the problem's dimensions

ii. Incubation – subconscious mulling of the problem

iii. Intimation – inkling that a solution is on its way

iv. Illumination – discovery; "Eureka!"

v. Verification – focus on practicality, effectiveness, appropriateness

There has been some empirical research looking at whether the concept of "incubation" implies a period of interruption or rest from a problem that may aid creative problem-solving. There is a further hypothesis that incubation aids creative problem-solving in that it enables "forgetting" of misleading clues. Understanding the role of incubation is essential when developing creative and innovative strategies to address those with autism, dyslexia and dyscalculia.

Joy Paul Guilford (1897- 1987)

Guilford (1967) drew a distinction between convergent and divergent thinking. Convergent thinking involves aiming for a single, correct solution to a problem, whereas divergent thinking involves creative generation of multiple answers to a problem. Convergent thinking involves analysis and evaluation, while divergent thinking is exemplified by the rules of brainstorming (e.g., generate many ideas and do not evaluate them during this initial activity). Figure 1. Creative Thinking Process (CTP) illustrates that contrary to the belief that creative thinking is synonymous with divergent thinking, the sequence of both divergent and convergent thinking, comprise creative thinking which underlies creative problem solving. The CTP is appropriate for finding both the real problem or the best solution once you have identified the real problem (often we work on what we believe on the surface to be the real problem, but in reality-is not).

The CTP depiction in Figure 1. shows too that we initially generate many ideas concerning a problem or proposed solution to the problem (e.g., what is the real problem or what is the best solution). Next, we analyze and evaluate these ideas and select (converge) on a single one. The problem solver then brainstorms different aspects of this selection (divergent thinking) and once again converges to select a choice. This sequence continues until we are satisfied with a selection that we wish to implement. Thus, creative thinking is the sequence of divergent and convergent thinking until a satisfactory problem or the solution is achieved. The problem solver is either successful or not in each reiteration of the sequence. With success, the real problem or best solution is identified. Without success, the problem solver returns to the problem or solution being addressed and continues the sequence until success is reached.
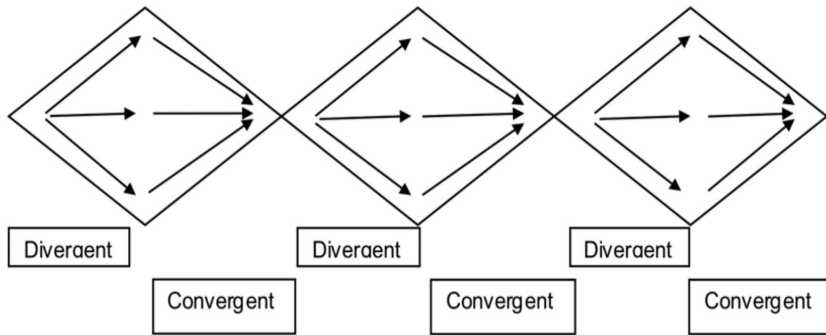
Figure 1. Creative Thinking Process (with permission from Tanner & Reisman, 2014, p. 98)

Guilford in his incoming 1950 presidential address to the American Psychological Association (APA) called for a resurgence in research on creativity:

> The subject of creativity has been neglected by psychologists. The immediate problem has two aspects. (1) How can we discover creative promise in our children and our youth? And (2) How can we promote the development of creative personalities? Creative talent cannot be accounted for adequately in terms of I.Q. A new way of thinking about creativity and creative productivity is seen in the factorial conceptions of personality. A fruitful exploratory approach can be made by application of factor analysis. Carefully constructed hypotheses concerning primary abilities will lead to the use of novel types of tests. New factors will be discovered that will provide us with means to select individuals with creative personalities. The properties of primary abilities should be studied to improve educational methods and further their utilization. (Guilford, 1950)

Ellis Paul Torrance (1915–2003)

E. Paul Torrance, building upon Guilford's work, developed the Torrance Tests of Creative Thinking (TTCT) that is a psychometric approach to measuring creativity (Torrance & Ball, 1984). It is still the most widely used creativity assessment worldwide. Fredricka K. Reisman, PhD, founder of the School of Education and the Drexel/Torrance Center for Creativity & Innovation at Drexel University and an author for this chapter, was trained by Dr. Torrance to administer and score the TTCT while

they were colleagues at the University of Georgia. They went on to engage in research and writing for 35 years, culminating in a trilogy of books on learning mathematics creatively (Torrance & Reisman, 2000a, 2000b; Reisman & Torrance, 2002). In addition to his prolific research and publications, Torrance created The Manifesto: A Guide To Developing a Creative Career. He drew on his findings to develop a Manifesto to help children and adults to live more creatively. Torrance wrote, "I drew these guidelines from my longitudinal studies in which I had encountered some creatively gifted children with learning disabilities, but I now realize that I was writing them for myself" (Torrance, 2002, p. 93).

E. Paul Torrance's Manifesto

Don't be afraid to fall in love with something and pursue it with intensity.

Know, understand, take pride in, practice, develop, exploit, and enjoy your greatest strengths.

Learn to free yourself from the expectations of others and walk away from the games they impose on you.
Free yourself to play your own game.

Find a great teacher or mentor who will help you.

Don't waste energy trying to be well-rounded.

Do what you love and can do well.

Learn the skills of interdependence.

Abraham Maslow (1908–1970)

Maslow's Hierarchy of Human Needs (Maslow, 1954)[1] presents a ladder of needs beginning with the most basic physiological needs (e.g., food, water, shelter, clothing), the safety needs (both physiological and psychological), love/belonging, esteem (self-concept), and self-actualization.

Carl Rogers (1902–1987)

Rogers described a role of a creative teacher as facilitating innovation by: setting a positive climate for creative thinking, clarifying the purposes of student expectations, organizing and making available creativi-

ty resources, balancing intellectual and emotional components of creative endeavors, and sharing feelings and thoughts with colleagues but not dominating (Rogers, 1969).

Alex Osborn (1888–1966) & Sidney Parnes (1922–2013)

The model is usually presented as five steps, but sometimes a preliminary step is added called **mess-finding,** which involves locating a challenge or problem to apply the model. The total six stages are: 1. Mess-finding (Objective Finding), 2. Fact-finding, 3. Problem-Finding, 4. Idea-finding, 5. Solution finding (Idea evaluation), and 6. Acceptance-finding (Idea implementation). This model, which provides another look at the creative problem-solving process, relies upon brainstorming and the difference between divergent and convergent thinking.[2]

Mihaly Csikszentmihalyi (1934 –) [Pronounced "ME-high CHICK-sent-me-high-ee."] Csikszentmihalyi's theory (1996) focuses on the interaction among the individual (e.g., student, teacher, parent), the domain or the discipline (e.g., creativity, reading, mathematics, ASD, dyslexia, dyscalculia) and the field comprised of the gatekeepers (e.g., special educations teachers and administrators whose decisions either allow or inhibit individual and/or group innovation of creative pedagogies, special education researchers).

Teresa Amabile (1950 –) [Pronounced "a-MA-ba-lee."]

Motivation is central to Amabile's (Amabile & Mueller, 2008) research, finding that intrinsic motivation is more apt to generate creativity than extrinsic motivation. However, it is often necessary to provide some sort of extrinsic reward or recognition to capture a student's willingness to interact. Then, when he or she gains some success in a task, the effort for the mere joy of the activity kicks in.

Robert J. Sternberg (1949–)

Sternberg (1985) presented two ideas: his Triarchic Theory of Human Intelligence proposes that creativity is a balance among three forms of thinking: analytical, creative, and practical. Teachers often have to **analyze**, critique, judge, compare/ contrast, evaluate, assess. **Creative** tasks deal with the ability to invent, discover, imagine, suppose, predict and should be accessible for teachers, parents and students. **Practical** intelligence is involved in everyday problem solving and is often evident as a student strength outside of the classroom. Sternberg further compared creativity to investment activities of buying low and selling high. Investment theory highlights perseverance in selling one's creative idea (s). Teachers and parents need to do this as advocates for

youngsters with dyslexia and/or dyscalculia when they come upon a far-out strategy that works.

Tanner and Reisman (2014, p. 79) provided the following summary of the foundation knowledge of creativity:

> …different perspectives of investigating creativity include a psychometric approach which focuses on assessing one's creative strengths (Torrance); a systems approach to understanding creativity (Csikszentmihalyi) which focuses on the individual, the domain (discipline), and the field (gatekeepers of an industry); the role of intrinsic and extrinsic motivation (Amabile) which states that intrinsic motivation yields more creative products; comparison with intelligence (Guilford, Sternberg); multiple intelligences (Gardner); humanistic psychology (Rogers, Maslow); and creative problem solving models (Wallas, Osborn & Parnes).

Current Theories of Creativity

"Four C" model

James C. Kaufman and Ron Beghetto (2009) introduced a "four C" model of creativity that allows for different levels of creativity to be recognized and celebrated. The Model is comprised of the following categories:

Category	Definition
Mini-c	transformative learning involving personally meaningful interpretations of experiences, actions and insights
Little-c	everyday problem solving and creative expression
Pro-C	exhibited by people who are professionally or vocationally creative though not necessarily eminent
Big-C	creativity considered great in the given field

Table 1. Kauffman-Beghetto Four C Model of Creativity

Geneplore Model

Under the Geneplore model (Finke et al, 1992), creativity is broken down into two distinct phases. The first phase is the generative phase, where lots of thoughts or concepts are spawned and are judged by two criteria-- originality and practicality. The second phase is the explorative or elaboration phase, where the creative ideas generated from the first phase are expanded and explored in further depth.

The Explicit–Implicit Interaction (EII) theory

Helie and Sun (2010) proposed the EII theory for understanding creativity in problem solving that encompasses incubation, insight, and various other related phenomena. The EII theory relies mainly on the following five basic principles:

1. The co-existence of and the difference between explicit and implicit knowledge;

2. The simultaneous involvement of implicit and explicit processes in most tasks;

3. The redundant representation of explicit and implicit knowledge;

4. The integration of the results of explicit and implicit processing; and

5. The iterative processing.

Thus, EII unifies a lot of fragmentary pre-existing theories that only account for some aspects of creative problem solving, but not in a unified way. EII unifies those fragments and provides a more coherent, more complete theory.

Conceptual blending

In *The Act of Creation*, Arthur Koestler (1964) introduced the concept of *bisociation*—that creativity arises as a result of the intersection of two quite different frames of reference. This idea was later developed into conceptual blending. In the '90s, various approaches in cognitive science that dealt with metaphor, analogy and structure mapping have been converging, and a new integrative approach to the study of creativity in science, art and humor has emerged under the label conceptual blending.

Honing theory

Honing theory (Gabora, 2002) posits that creativity arises due to the self-organizing, self-mending nature of a worldview. It is by way of the creative process the individual hones (and re-hones) an integrated worldview, and similarly results in changes in the worldview.

Grit

Grit is defined as perseverance and effort expended for long-term goals (Duckworth et al, 2007; Duckworth et al, 2016). Grit involves working persistently toward completing tasks, despite disappointment or hardship. Advocates of creative endeavors need to show grit as they often are rowing against the tide of indifference or bias. Those of us who are advocates for creativity show grit as we overcome disinterest, misunderstanding and outright resistance by squelchers (e.g., "creativity only involves the arts", "kids need to be told what and how to learn", "oh, creativity again"—as eyes roll, etc.).

Right-Left Brain Hypothesis

Daniel Pink, in his 2005 book A Whole New Mind, repeating arguments posed throughout the 20th century, argues that we are entering a new age where creativity is becoming increasingly important. In this conceptual age, we will need to foster and encourage right-directed thinking (representing creativity and emotion) over left-directed thinking (representing logical, analytical thought). However, this simplification of 'right' versus 'left' brain thinking is not supported by the research data.

These modern theories of creativity do not require that we discard the older bedrock models. On the contrary, we should build upon these with new insights and designs. Applying creative problem solving to autism and dyslexia and dyscalculia allows us to help the individual focus on strengths and circumvent disabilities.

Creativity and Autism Spectrum Disorder (ASD)

Why creativity? It is hypothesized that creativity enhancement is a good thing for ASD individuals as several studies found that creativity predicts a longer life, being creative helps one become a better problem solver in all areas of their life and work, and engaging in the creative process is a great confidence builder because you discover that failure is part of the process, is survivable, helps us grow, makes our lives and work better, and allows us to try new things even at the risk of failing (Rodriguez, 2012; Runco, & Acar, 2012; Treffert, 2014). Only one published research study from Scotland (Best, Shruti, Porter & Doherty, 2015) looked at the creativity-autism rela-

tion. They found that the ASD participants were lower on frequency of idea generation but significantly superior on producing original ideas. In addition to frequency and originality, the research described next taps nine additional creative thinking factors and includes open ended questions to enrich the data.

Research that explored the possession of creativity in adults diagnosed with an autism spectrum disorder (ASD) as compared to neuro-typical[3] adults, all of whom are graduate students in masters and doctorate programs was conducted. The relationship between 11 creative thinking factors tapped by the Reisman Diagnostic Creativity Assessment (RDCA)[4], in adults diagnosed with an autism spectrum disorder (ASD) via the Sub-threshold Autism Trait Questionnaire (SATQ) (Kanne, Wang & Christ, 2012), compared to neuro-typical adults, will provide a foundation for subsequent translational research for enhancing creative strengths of autistic populations.

The Reisman Diagnostic Creativity Assessment (RDCA) is a self-report 40 item free online App that assesses an individual's self-perception on 11 major research-based creativity factors (fluency, originality, elaboration, resistance to premature closure, flexibility, tolerance for ambiguity, convergent thinking, divergent thinking, risk taking, intrinsic and extrinsic motivation). Advantages of the RDCA are brevity (common completion times are ten minutes or less), ease of scoring, and the ability to obtain immediate results (Reisman, Keiser & Otti, 2016). The SATQ is also a brief, easy to administer assessment that assesses for a broad range of ASD traits, and is relevant to the general public. The SATQ, an adapted version of the SATQ (Kanne, Wang and Christ, 2012), was administered to all study participants.

Research questions regarding autism included the following:

1. What differences, if any, are observed on the RDCA when comparing neurotypical adults with neuro-diverse adults, specifically those diagnosed with an ASD?

2. In regard to the 11 RDCA creative thinking factors, was there a pattern of creative strengths and weaknesses when comparing neuro-typical adults with ASD adults?

3. What basic, applied and translational research questions emerge from this initial investigation of the relationship between autism and creative thinking with the goal of enhancing creative strengths of autistic populations?

Although 184 participants completed both the RDCA and SATQ, only two participants reported that they had been diagnosed with an ASD disorder. Therefore, the first and second research questions could not be answered.

However, several patterns emerged as a result of statistical analysis of the data that are worthy of note.

In the current study, the total non ASD student sample (182 participants) had a total mean SATQ score of 39 and the ASD participants (2 participants) had a total mean SATQ score of 37. Although the sample of ASD participants was two small to be able to make any inferences regarding the differences between the two groups, the mean SATQ score of the self-reported non ASD participants was very close to the SATQ mean scores of the ASD participants in the Kanne, et. al. (2012) and Nishiyama, et. al (2014) studies.

In the study by Kanne, Wang and Christ (2012), the authors found that participants with ASD traits scored higher in the SATQ than the control group. The mean total SATQ score for participants who self-reported an ASD diagnosis (17 participants) was 40.8 and a mean total SATQ score of 23.1 for the total student sample (1,692 participants). Similar results were obtained in a study conducted by Nishiyama, Suzuki, and Adachi, et.al (2014) where the SATQ mean score of the ASD participants (60 participants) was 45.2 and the mean score for the total participants (3,147 participants) was 31.

The similarity in findings between all three studies suggests that it is possible that a number of non-ASD participants may exhibit ASD traits, but may have never being diagnosed, or they may not have disclosed an ASD diagnosis. This finding warrants further exploration.

Second, a scatter plot of the total scores of both the RDCA and the SATQ (Figure 4) revealed an upward linear slope denoting a possible correlation. A Pearson correlation test revealed a weak correlation (.33). A larger ASD population in the sample may have provided different results. This finding also warrants further exploration.

Scatter Plot - Total of Scores

Total SATQ Scores
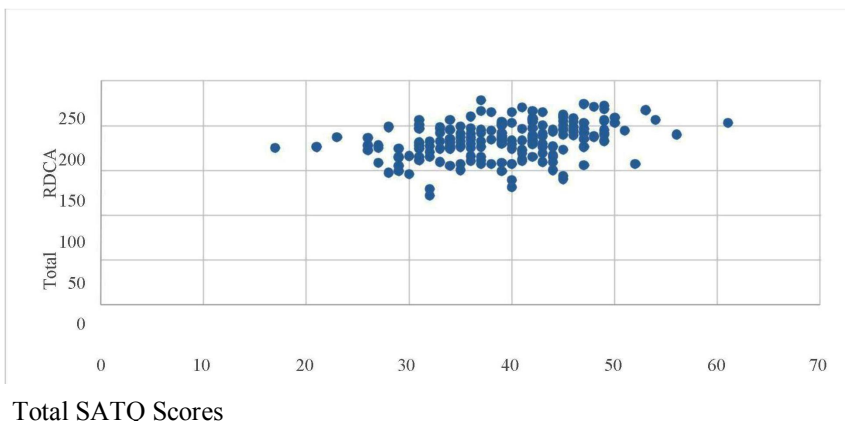
Figure 4. Scatter Plot of SATQ and RDCA Total Scores

Third, several correlations emerged through the analysis of specific SATQ questions and RDCA factors. These correlations are depicted in Table 2. These correlations raise several questions, specifically, why is there a difference in the two RDCA factors of originality and elaboration, but not as significant a correlation as seen with the other RDCA factors (fluency; flexibility; risk taking and tolerance of ambiguity). These correlations, as well as the lack of correlations call for further examination with a larger ASD population in order to compare and contrast the ASD sample with neuro-typical participants.

SATQ Question	RDCA Factor	R
#61 - I can have a back and forth conversation (listen well and change topics appropriately).	Fluency	.12
#66 - I tend to repeat certain words or phrases over and over again.	Flexibility	.05
#71 – I am good at using words to express my thoughts and ideas.	Elaboration	.34
#73 – I have a good imagination.	Originality	.51
#74 – I am comfortable with spontaneity, such as going to new places and trying new things.	Risk Taking	-.02
#75 – I tend to stick to routines in my day to day life, preferring to do things the same way.	Tolerance of Ambiguity	-.25

Table 2. Correlations between specific SATQ questions and RDCA factors

Lastly, eleven SATQ questions (Table 3) were selected for analysis based on their similarity to RDCA factors. For RDCA items categorized by creativity factors, please see Appendix A: RDCA Assessment Interpretation.

SATQ Question	SATQ Question Wording
56	I enjoy social situations where I can meet new people and chat (i.e., parties, dances, sports and games).
57	I seek out and approach others for social interactions
59	Others consider me warm, caring and/or friendly.
60	I respond appropriately to other people's emotions (for example, comforting someone who is upset).
62	I use many gestures when speaking with others such as shrugging, "talking with my hands", nodding my head, etc.
63	Others think that I am odd or quirky.
64	I have some behaviors that others consider odd or quirky.
68	I am good at knowing what others are feeling by watching their facial expressions or listening to the tone of their voice.
70	I make eye contact when talking with others.
74	I am comfortable with spontaneity, such as going to new places and trying new things.
75	I tend to stick to routines in my day to day life, preferring to do things the same way.

Table 3. SATQ questions

As shown in Figure 5, a Pearson Correlation revealed a weak correlation amongst the questions (.29). Further research is needed in order to fully explore a correlation between the SATQ and RDCA questions.

Comparison of SATQ Questions

In all, participants were highly creative as measured by a mean RDCA total score of 184. As shown in the *Individual RDCA Score Interpretation Table*

located in the Appendix, a score range of 144-203 that translates to a percentile range of 60%-84.5% is interpreted as moderately high. This is the second highest classification with the highest possible total RDCA score of 240. Thus, this study supports previous evidence that in the ASD population, creativity may be a hidden strength. It is reasonable that if recognized and enhanced, the relationship between creativity and ASD could positively affect self-efficacy, self-concept, and the way ASD folk are perceived by parents, teachers, employers and others.
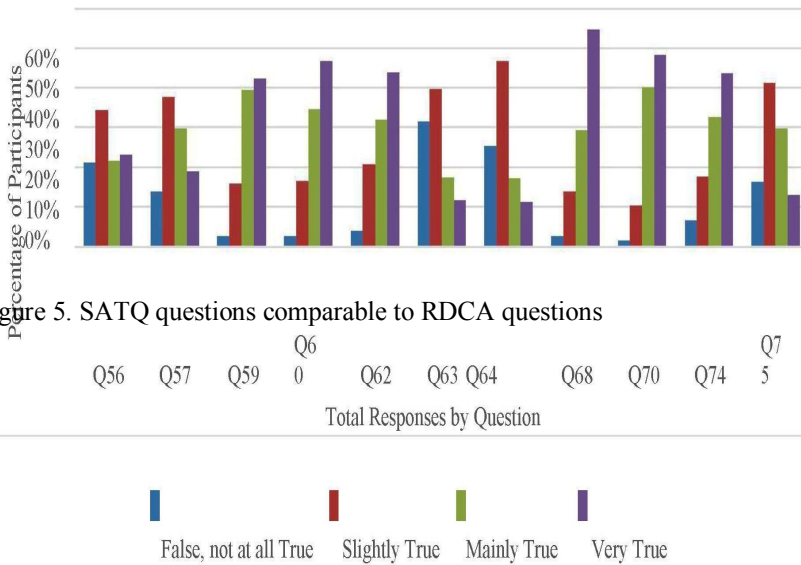
Figure 5. SATQ questions comparable to RDCA questions
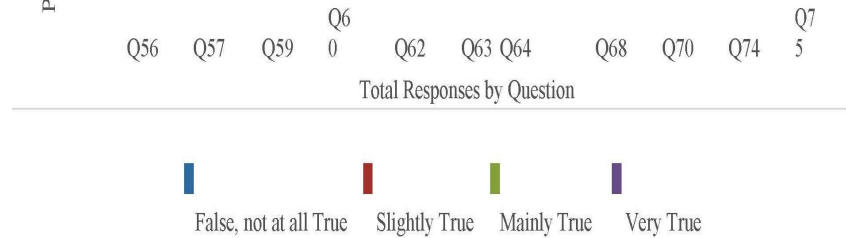
Creativity and Dyslexia and/or Dysalculia

Left-hemisphere deficiencies involving dyslexia and dyscalculia are fundamentally linked to right-hemisphere strengths, such as visual thinking, spatial ability, pattern recognition, problem solving, heightened intuition and creativity (West, 1997). In addition, there are basic abilities that all dyslexics share, such as being "highly aware of the environment…more curious than average…think mainly in pictures instead of words…have vivid imaginations (Davis, 2010). Reading and mathematics a r e communicated by means of various symbol systems. "In order to communicate thoughts . . .there must be a conventional system of signs or symbols which when used by some persons, are understood by other persons receiving them" (Gelb, 1963, p. 1). These symbols are arbitrarily associated with ideas they represent. As graphic systems evolved over time, they became increasingly more systematized. However, in spite of increased use of systematization, acquisition of language

in graphic form is very difficult for some children. The interaction between creativity and dyslexia and dyscalculia is powerful as an enhancing strategy that recognizes the creative strengths of those with dyslexia and/or dyscalculia leading to positive effects on self-concept and self-efficacy (the belief that you can do something).

Individuals with dyslexia and/or dyscalculia enjoy academic successes when provided appropriate accommodations. These accommodations can provide unique insights that will enhance learning for all, and providing accommodations for these students will allow them to have the same opportunities to learn as those without dyslexia/dyscalculia. With accommodations, these students can succeed, and even thrive at the most rigorous colleges, graduate programs, and professional schools.

Selected accommodations involving assistive technologies include both *low tech/low cost* (highlighters, calculators, index card to follow a line of text, enlarging print, learning keyboarding skills, using spellcheck) and *higher tech/higher cost* (speech to print, print to speech software technologies, programs to practice fluency, computer programs to assist in organizing ideas, feed-back on writing in real-time, word prediction software). Furthermore, adjustments in time needed to access strength and demonstrate knowledge translates to the necessity of additional time on tests and for completion of assignments. Also, course substitution, e.g., exchanging a foreign language course for a culture course (or for time to practice needed skills)
is appropriate. These traditional accommodations lay the foundation for enhancing ASD folks coping, but their creativity might help develop their strengths in identifying, formulating and solving problems; generating original and novel ideas that are relevant to a given situation; enhancing their self-efficacy and self-concept, and having faith in their strengths.

Creativity Activities That May Be Applied To ASD and Dyslexia and Dysalculia

Following are several activities that may be applied when working with people with ASD, Dyslexia and Dyscalculia.

The Six Thinking Hats

The Six Thinking Hats (or modes of thinking) shown in Figure 6, created by Edward DeBono (1985) are based upon a fundamental understanding of how the brain handles information, This systematic method of thinking is a metaphor for a simple, effective technique that helps individuals separate thinking into six distinct categories. The results of his research is documented by numerous testimonials from corporate CEOs, educators, the military, and a variety of industries. Each category is identified with its own colored metaphorical "thinking hat." By mentally wearing and switching "hats," the role play approach allows a group of six to take on various thinking and emotional

roles. Middle and high school students as well as pre-service teachers and law students have enjoyed this exercise and find that they easily focus or redirect thoughts during facilitated conversation. A modification of the six hats exercise that may accommodate those with ASD may be to have one individual (rather than a group) change hats to try out different thinking.

White Thinking Hat

White Hat thinking calls for information known or needed, focuses on data and facts.

Black Thinking Hat

Black Hat thinking focuses on difficulties, potential problems. The Black hat is judgmental – the devil's advocate or why something may not work – a squelcher of ideas.

Red Thinking Hat

Red Hat thinking focuses on feelings, hunches, gut instinct, and intuition

Green Thinking Hat

Green Hat thinking focuses on creativity: alternatives, solutions, new ideas, possibilities.

Yellow Thinking Hat

Yellow Hat thinking focuses on values and benefits. Why something may work. The Yellow hat symbolizes brightness and optimism.

Blue Thinking Hat

Blue Hat thinking focuses on the thinking process, next steps, action plans. The Blue Hat is used to manage the thinking process.

Figure 6. The Six Thinking Hats

Lateral Thinking

Lateral Thinking increases the number of new and practical ideas using unconventional thinking techniques, which involve disrupting an apparent thinking sequence and arriving at the solution from another angle. It involves generating ideas and solving problems by looking at a situation or problem from a unique perspective. It is the ability to think creatively or "outside the box." Lateral thinking involves breaking away from traditional modes of thinking and discarding established patterns and preconceived notions.

The term *lateral thinking* was coined by Edward De Bono (1967) and he explained that typical problem-solving techniques involve a linear, step-by-step approach while lateral thinking involves arriving at more creative answers by taking a step sideways to investigate a situation from an entirely different viewpoint as shown in Figure 7.
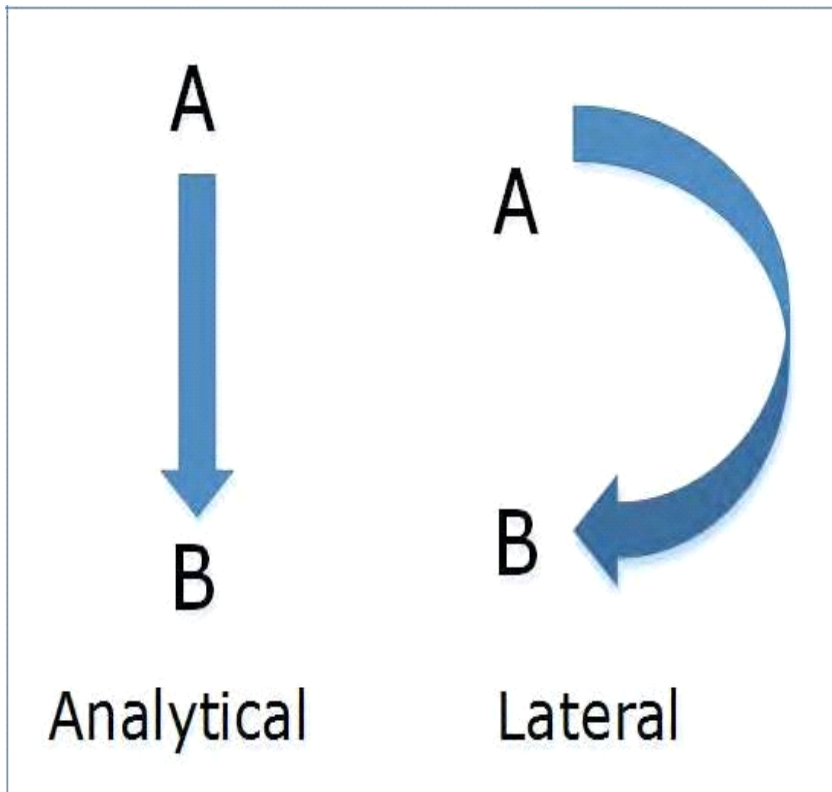
Figure 7. Comparing Analytical and Lateral Thinking

Lateral Thinking Techniques

Following are seven lateral thinking techniques that enhance creative thinking:

Alternatives

This technique involves generating new concepts (general theories or ways of doing things) that lead to a whole new way for generating more ideas.

Focus

This technique changes focus that others have not pursued that often leads to novel ideas.

Challenge

The challenge technique involves breaking barriers of known procedures.

Random Entry

Random Entry involves finding connections between seemingly unrelated things, using a randomly chosen word, picture, sound, or other stimulus to jar conventional thinking.

Provocation and Movement

Provocation involves generating a list of innovative ideas that trigger additional creative ideas.

Harvesting

Harvesting techniques involve selecting practical and valuable ideas that can be transformed into actions.

Treatment of Ideas

Treatment of Ideas involves shaping or restructuring an idea to fit within possible constraints.

Summary of Creativity and Innovation Research Results

The following key research results regarding group creativity and innovation are based upon acomprehensive meta-analysis (De Dreu, C.K.W., Weingart, L.R., & Kwon, S.; 2000):

- Teams are more innovative when members have a *common understanding of team objectives* and are also committed to them.
- *Goal interdependence* involves team members mutually meeting their goals.
- Teams are more innovative when superiors *expect and approve of innovation, support members when their attempts to innovate are not successful, recognize and reward new ideas and their implementation, encourage smart risk taking, and learn from failures.*
- Researchers define cohesion as *creating a psychologically safe environment* that enables members to challenge each other and the status quo.
- Successful internal *communication (between team members*) encourages sharing knowledge and ideas, and creates a safe environment for risk taking. External communication (*communication with those outside the team*) fosters creativity and innovation by learning from others and introducing new team information.

Following are factors that affect innovation:

- Creativity and innovation require different individual skills and team structures and processes. The idea generation stage involves divergent thinking while innovation involves convergent thinking.
- The research shows mixed results regarding increasing team diversity. A recent meta-analysis (Stahl et al, 2009) found that in addition to reducing group cohesion, cultural diversity increases creativity, but also increases task conflicts regarding the distribution of resources, procedures and policies, and interpretation of facts.
- Conflict has been considered a key factor in creativity and innovation but the research has yielded mixed results.
- Creative productivity is greater when departments or other structured environments comprise creatively heterogeneous members rather than all highly creative.
- Not allowing adequate time for incubation causes individuals to be less innovative. It is very important to provide opportunities for individuals and teams to move away from projects for a time and return with fresh thoughts. Some organizations have various types of activities to allow team members to divert their minds to other areas and eventually bring a renewed perspective to their primary project. Firms, including Pixar Animation Studios, have interdisciplinary team members working on a primary film project but also play a smaller role in others. This mishmash of tasks allows them to focus and refocus during the creativity process. Demanding creativity by the clock, a "brains to the grindstone" approach is very problematic. Many people feel they are most

creative when faced with tight time constraints but research does not support this view (Amabile, Hadley, Kramer 2002). Obviously, projects have timelines, movies do need to hit the theaters, and "innovation needs to ship," but too much emphasis on time can lead to "the pressure trap," the drop in creative thinking becomes most apparent when time pressure is the greatest (Reisman and Hartz, 2010).

- The creativity literature points to certain traits that distinguish highly creative individuals from colleagues. These traits include a high level of curiosity, willingness to learn from experience, preparedness to take risks, persistence in situations of failure, high levels of energy and distinctive goal orientation. Creative people typically tolerate contradictions, ambiguities and uncertainties in their work. Many terms represent creativity such as original, relevant, influential, innovative, out-of-the-box, fluent, flexible, divergent, open, generative, non-judgmental, resists premature closure, tolerates ambiguity, risk taker, and courageous. Three currently prevalent descriptors of creativity are: novel which refers to something original and unique, appropriate or suitable, and useful which means serving a purpose.

  Highly creative individuals ask more questions; they thrive on inquiry and discovery. Sometimes the questions do not seem to be to the point. They seem to take longer to get ready to solve problems and may see problems as more complex. Sometimes this is referred to the "mountain out of a molehill" challenge but they are more perceptive and notice more possibilities. They embrace change and prefer to create new things rather than just improve on the old. They bring to the process knowledge from a wide variety of fields beyond their "specialty." They are more self-critical and will question criticism which is sometimes interpreted as defensive behavior. They have a very low sense of associative fear and are willing to look for connections in many areas sometimes out of their perceived field of excellence (Reisman and Hartz, 2010).

Tools and Techniques for Enhancing Creativity

Teachers can provide tools and techniques for enhancing creativity.

1. ***Torrance***, building upon Guilford's work, suggested the following activities:
   - ***unusual uses tasks*** whereby the participant is asked to generate unusual uses of an object such as a brick, tin can or book. Company related objects such as a pharmaceutical product, an engineering technology artifact, a blue print, etc. may be used;

- ***impossibilities task*** asks the participants to list as many impossibilities or improbable situations as they can;
- ***consequences task*** involves predicting possible outcomes of a situation (e.g., forecasting financial options for a company, possible results of modifying job descriptions, think of many solutions to a situation (e.g., avoid negative impact on a community if a plant is in financial trouble);
- ***improvement task*** involves giving a list of common objects and participants are asked to suggest as many ways as they can to improve each object without regard to whether or not their suggestions are possible.

2. **SCAMPER** is an acronym for the following words: **S**ubstitute, **C**ombine, **A**dapt, **M**odify, **P**ut to other uses, **E**liminate, and **R**earrange. This technique involves a list of verbs that you relate to a problem resulting in create solutions. See http://creatingminds.org/tools/scamper.htm.

3. **CATWOE** is an acronym for <u>*Customers*</u> – (Who is on the receiving end? What problem do they have now? How will they react to what you are proposing?); <u>*Actors*</u> – (Who are the actors who will carry out your solution? What is the impact on them? How might they react?); <u>*Transformation process*</u> – (What is the process for transforming inputs into outputs?); <u>*World*</u> <u>*View*</u> – (What is the bigger picture into which the situation fits? What is the <u>real</u> problem you are working on? What is the wider impact of any solution?); <u>*O*</u><u>*wner*</u> – (Who is the real owner or owners of the process or situation you are changing? Can they help you or stop you? What would cause them to get in your way? What would lead them to help you?); <u>*Environmental*</u> <u>*constraints*</u> – (What are the broader constraints that act on the situation and your ideas? What are the ethical limits, the laws, financial constraints, limited resources? regulations, and so on? How might these constrain your solution? How can you get around them?) See http://creatingminds.org/tools/catwoe.htm.

4. **NUF Test** is helpful when you want to identify what to work on: being more creative, developing an idea or getting something that you will be able to implement. The acronym stands for <u>***Bew***</u>: not been tried before; ***Useful***: solves the problem*; **Feasible**:* can be implemented in practice. Solutions to the following problem may be scored from 0 to 10 on these three characteristics: *An idea for keeping a door open.* One solution, which is scored below (Table 4), may be to use a magnet attached to the wall and to the door. Each solution generated could be scored and the one with the highest score be given serious consideration.

Criteria	Rating	Assessment
New	2	Similar ideas have been used before
Useful	7	Should work
Feasible	3	Expensive to install on grand scale
Total		

Table 4. NUF Test Example

5. *ASIT* , is built on TRIZ (see http://www.mazur.net/triz/) and emphasizes that functional fixation is our inability to visualize a new use for an existing object. ASIT is a structured way of thinking that provides systematic built-in tools that will help you analyze problems and find solutions that are surprising in their simplicity. The author, Dr. Roni Horowitz earned his Ph.D. at the Engineering Faculty of Tel Aviv University in the field of creative problem solving and design. He asserts that ASIT can be used to solve business problems, technical problems, and personal problems. The cost is very inexpensive. See http://www.start2think.com/.

6. *Mindtools* provides a Toolkit addressing the following skills that a Talent Manager can use: Leadership Tools, Team Tools, Strategy Tools, Problem Solving Techniques, Decision Making Tools, Project Planning Skills, Time Management Techniques, Stress Tools, Communication Skills, Creativity Techniques, Learning Skills and Study Techniques, and Career Development Skills. The cost is very inexpensive. See http://www.mindtools.com/community/pages/article/newSTR_50.php.

7. Another excellent resource offering a variety of tools and techniques for enhancing creativity is: Michalko, M. (2006). *Thinkertoys: a handbook of creative-thinking techniques* (2nd Edition). Berkeley, CA: Ten Speed Press.

Finally, becoming aware of your creative strengths is key to using your creativity. The Reisman Diagnostic Creativity Assessment (RDCA), which the KIE 2017 RDCA SIG highlights is discussed above within the ASD research results and also in the Appendix

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Appendix A: RDCA Assessment Interpretation

Reisman Diagnostic Creativity Assessment (RDCA) https://itunes.apple.com/ us/app/reisman-diagnostic-creativity/id416033397?mt=8

RDCA Interpretation:

The Individual RDCA Score Interpretation Table is a diagnostic tool that provides a profile of one's RDCA assessment, meaning of results reported as percentage on the related creativity factors scale, indication of strong creativity characteristics and those that one might wish to enhance.

Example: A Total Score of 240 means you selected the highest scoring option for each item for 100% of the items. (Note: Some items – 15, 22, 33 - were reversed score, i.e., selection "Strongly Disagree" was the highest scoring option instead of "Strongly Agree.")

Example: A score of 22 for the Originality factor reflects that you obtained 61% of the possible 36 Originality factor points comprised of the 6 Originality RDCA items.

Individual RDCA Score Interpretation Table

RDCA Score x Factor (Maximum points possible)	Equivalent %	Classification	Factor Definition	RDCA Items Related to Factors
Total Score (240 possible score)	Score of: 204-240 85%-100%	Very High		
	144-203 60%-84.5%	Moderately High		
	120-143 50%-59.5%	Average		
	96-119 40%-49.5%	Low		
	0-95 0%-39.5%	Very Low		
Originality (36 possible score)	Score of: 30-36 83%-100%	Very High	Unique and Novel	I regularly come up with novel uses for things. 4. I come up with new and unusual ideas. 8. I come up with unique suggestions, thought up wholly or partly independently of other people. 13. I think in unconventional ways. 20. I usually think out of the box. 29. I am very innovative.
	22-29 61%-80.5%	Moderately High		
	18-21 50%-58%	Average		
	14-17 39%-47%	Low		
	0-13 0%-36%	Very Low		

RDCA Score x Factor (Maximum points possible)	Equivalent %	Classification	Factor Definition	RDCA Items Related to Factors
Fluency (18 possible score)	**Score of:**		**Generates Many Ideas**	7. I can generate many relevant solutions.
	15-18 83%-100%	**Very High**		28. I can rapidly produce a lot of ideas relevant to a task.
	11 -14 61%-78%	**Moderately High**		36. I generate many ideas when I draw.
	9-10 50%-55.5%	**Average**		
	7-8 39%-44.4%	**Low**		
	0-6 0%-33.3%	**Very Low**		
Flexibility (18 possible score)	**Score of:**		**Generates Many Categories of Ideas**	14. I come up with different categories of approaches to solving problems.
	15-18 83%-100%	**Very High**		21. I come up with different types of responses to a situation.
	11 -14 61%-78%	**Moderately High**		31. I generate different categories of uses for a specific item.
	9-10 50%-55.5%	**Average**		
	7-8 39%-44.4%	**Low**		
	0-6 0%-33.3%	**Very Low**		
Elaboration (24 possible score)	**Score of:**		**Adds Detail**	9. I fill in details when drawing.
	20-24 83%-100%	**Very High**		19. I tend to elaborate on my ideas when speaking.
	15-19 62.5%-79%	**Moderately High**		27. I tend to keep adding to my drawings.
	12-14 50%-58%	**Average**		39. I tend to elaborate on my ideas when writing.
	9-11 37.5%-45.8%	**Low**		
	0-8 0%-33.3%	**Very Low**		

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RDCA Score x Factor (Maximum points possible)	Equivalent %	Classification	Factor Definition	RDCA Items Related to Factors
Tolerance of Ambiguity (18 possible score)	Score of:		**Comfortable with the**	24. I can tolerate the unknown.
	15-18 83%-100%	**Very High**	**Unknown**	35. I can cope with uncertainty.
	11 -14 61%-78%	**Moderately High**		40. I generate many ideas.
	9-10 50%-55.5%	**Average**		
	7-8 39%-44.4%	**Low**		
	0-6 0%-33.3%	**Very Low**		
Resistance to Premature Closure (24 possible score)	Score of:		**Keeps an Open Mind**	1. I keep an open mind.
	20-24 83%-100%	**Very High**		11. When faced with a problem, I evaluate possible solutions and select the best one.
	15-19 62.5%-79%	**Moderately High**		23. I gather as much information as possible before making a decision.
	12-14 50%-58%	**Average**		32. I keep listening even when I think I know what someone is saying.
	9-11 37.5%-45.8%	**Low**		
	0-8 0%-33.3%	**Very Low**		
Divergent Thinking (18 possible score)	Score of:		**Generates Many Solutions** (related to fluency)	6. I follow many paths to come up with possible solutions.
	15-18 83%-100%	**Very High**		18. I come up with multiple possibilities when analyzing a problem by looking at every angle of the situation.
	11 -14 61%-78%	**Moderately High**		37. I prefer problems where there are many or several possible right answers.
	9-10 50%-55.5%	**Average**		
	7-8 39%-44.4%	**Low**		
	0-6 0%-33.3%	**Very Low**		

RDCA Score x Factor (Maximum points possible)	Equivalent %	Classification	Factor Definition	RDCA Items Related to Factors
Convergent Thinking (18 possible score)	Score of: 15-18 83%-100% 11-14 61%-78% 9-10 50%-55.5% 7-8 39%-44.4% 0-6 0%-33.3%	Very High Moderately High Average Low Very Low	Comes to Closure	5. I can make a decision when there are multiple possibilities or choices. 26. I can select one solution from many possibilities. 30. I do well on standardized tests that require a single correct response.
Risk Taking (24 possible score)	Score of: 20-24 83%-100% 15-19 62.5%-79% 12-14 50%-58% 9-11 37.5%-45.8% 0-8 0%-33.3%	Very High Moderately High Average Low Very Low	Adventuresome	2. I am willing to tackle challenging tasks even when success is uncertain. 10. I am afraid of the unknown. 16. I share and advocate ideas I believe in, even when those ideas are unconventional. 34. I am will to take calculated risks.
Intrinsic Motivation (24 possible score)	Score of: 20-24 83%-100% 15-19 62.5%-79% 12-14 50%-58% 9-11 37.5%-45.8% 0-8 0%-33.3%	Very High Moderately High Average Low Very Low	Inner Drive	12. I do well on activities or tasks that I find personally challenging. 17. I engage in activities that are personally satisfying. 25. Curiosity, enjoyment and interest energize me to complete a task. 38. My motivation to perform well does not depend on external recognition.

RDCA Score x Factor (Maximum points possible)	Equivalent %	Classification	Factor Definition	RDCA Items Related to Factors
Extrinsic Motivation (18 possible Score)	**Score of:** **15-18** **83%-100%** **11 -14** **61%-78%** **9-10** **50%-55.5%** **7-8** **39%-44.4%** **0-6** **0%-33.3%**	**Very High** **Moderately High** **Average** **Low** **Very Low**	**Needs Reward or Reinforcement**	15. I will use more effort on an activity or task if there is some kind of incentive. 22. I perform tasks better knowing there will be a reward or recognition. 33. Knowing that I am going to be rewarded enhances my creativity.

Notes

1. For a picture of Maslow's Hierarchy of Needs see: https://en.wikipedia.org/wiki/Maslow%27s_hierarchy_of_needs

2. For further discussion of the Osborn- Isaksen and Trefflinger model of creative problem solving see: http://members.optusnet.com.au/charles57/Creative/Brain/cps.htm.

3. Neurotypical or NT, an abbreviation of neurologically typical, is a neologism widely used in the autistic community as a label for people who are not on the autism spectrum. However, the term eventually became narrowed to refer to those with strictly typical neurology; that is, people without a defined neurological disorder. In other words, this refers to anyone who does not have any developmental disabilities such as autism, developmental coordination disorder or ADHD. (source: Wikipedia)

4. Reisman Diagnostic Creativity Assessment (RDCA) App (Reisman, F.; Keiser, L. & Otti. O. 2012). Free Apple App available in iTunes

CHAPTER THREE

"CREATIVITY TAKES COURAGE"

THE LINK BETWEEN CREATIVITY PROGRAMS AND STUDENT WELL-BEING IN THE URBAN COMMUNITY COLLEGE

KATHERINE BOUTRY

ABSTRACT Using data from student self-assessment surveys, this paper presents a test case for a new creativity program at West Los Angeles College and its link to student well-being. The first program of its kind in California, and the first in a community college anywhere, West Los Angeles College enjoys an exciting educational environment, surrounded by the burgeoning entertainment industry, aerospace industry, Silicon Beach, and multiple re-nowned institutions of higher learning. The college is thus well-poised to capitalize on the creative synergies made possible by the proximity of these industries and resources. Nevertheless, as an urban community college, WLAC has a traditionally underserved population with economic challenges. This paper posits that what might initially look like a disadvantage is actually a strength in developing a creativity program, and argues that a creativity program may enhance student well-being *especially* at urban community colleges. By showing students how their obstacles are opportunities for growth, and by giving them concrete skills to enhance their creative problem solving, this paper suggests that a creativity studies program significantly enhances well-being among students.

"Creativity takes courage."
> Henri Matisse

As the Director of the brand new Creativity Studies Lab at West Los Angeles College (the first in a community college anywhere), I was both excited and daunted by the prospect of introducing creativity studies to our college this year. My excitement stemmed from the fact that the environment is undenia-bly rich for such a program. West is at the intersection of leading-edge crea-tive industries like entertainment, technology, Silicon Beach, advanced manu-facturing (aviation, space exploration, engineering, biotechnology), arts and fashion (photography, art, theatre, music, architecture, fashion, design) and higher education, so the college is well-poised to capitalize on the creative synergies made possible by the proximity of these industries and resources. It was my goal to foster meaningful connections between this creative commu-

nity and the classroom in ways that would allow for mutual benefit, growth, and significant contributions to innovation.

Moreover, the campus climate is innovative and supportive of new programs. At West the faculty are passionate about student success and stand behind our college mission statement of "a transformative educational experience." To further the creativity initiative, I formed a Creativity Studies Lab comprised of an advisory board of industry professionals, faculty, and students who met monthly, and we came up with the following:

Creativity Studies Lab Mission
- To give our students a creative edge in the workforce and in transfer.
- To foster creativity on campus.
- To encourage dialogue both around the ways people imagine creativity and how they think and learn creatively.

- To infuse creativity into our classes and teaching.
- To enhance creativity in our students in quantifiable ways that would have a tangible, positive impact on their personal and professional lives.
- To better prepare our students by giving them life skills, not just knowledge.

]This is all incredibly promising. Nevertheless, as an urban community college, West has a traditionally underserved population with significant challenges. We have 19,000 students. 76% are students of color. How well are they prepared for college? On entering, 65% place below college-level in English and writing skills, only 6% place as math-ready. We have 500 veterans, not all of them honorably discharged. So we face obstacles, both financial, and in terms of the preparation our students receive before they walk through our doors. Was it wise for us to pioneer a creativity program in such an environment? Wouldn't it be better to let the traditional institutions take the lead?

In spite of, or perhaps *because of,* our underdog status, I was cautiously optimistic. I've been a professor at West for ten years, and I came after teaching at Harvard University for ten. So I am right at the fulcrum of my twenty-year career, well-poised to compare the two demographics. When I first started at West, I expected significant differences, and there were, but not in the ways you might expect. My students at West are every bit as brilliant and talented as my students at Harvard were. But they face a host of life challenges that would stop many of us in our tracks: lack of preparedness, lack of financial resources, lack of community and family support; many are the first in their families to attend college. Several of our students report being homeless. We have a food pantry on campus for those in need. Many beneficiaries of it are our students. Unlike traditional students, ours work 70-hour

weeks, pay rent themselves instead of relying on their parents, find affordable and good childcare for their own children, and stand in line for financial aid and basic healthcare. So, in short, they're neither less brilliant nor less talented, but life has not stopped dead to applaud their achievements either. In fact, life has made it pretty near impossible for them to get an education—and yet here they are.

How useful is a creativity certificate to an already overburdened demographic? It turns out that it may be very useful. Creativity is indispensable in the new economic climate. As Richard Florida (2012) proclaimed in *The Harvard Business Review*, we are now in the "Creative Age" (as opposed to the Agricultural and Industrial ages that preceded it) in which employees *must* demonstrate creativity in order to remain competitive in the workplace: "There's a whole new class of workers in the U.S. that's 38 million strong: the creative class . . . whose economic function is to create new ideas, new technology, or new content." Florida goes on to say that "Today, the creative sector of the U.S. economy employs more than 30% of the workforce --nearly half of all wage and salary income (some $2 trillion)" (Florida). Gerard Puccio (2012) quotes Florida in his seminal book *Creativity Rising,* and describes the economic climate further, "According to business writer Daniel Pink, the affluence of the nations, combined with the movement of much analytical work to automated methods and low-cost global production, means that we have arrived in an age where we must become 'a society of creators,'" (Puccio).

Moreover, creativity has been linked very powerfully to leadership, a quality we want for our students. In a study of 1500 CEOs from 60 countries and 33 industries conducted by IBM, 60% said that creativity is the most crucial trait for any business leader. In fact, according to a 2016 *Bloomberg Job Skills Report*, "What Recruiters Want," a poll of 1,251 job recruiters at 547 companies revealed the most highly sought skills in employees (but also the most difficult to find) were creative problem solving, leadership, strategic thinking, and adaptability. And this recognition of the importance of creativity isn't just expert opinion. *Time* magazine conducted a poll in which 72% of the general public said that creativity was important to this new economy (2013).

These findings are the driving force behind the Creativity Studies Lab at West, because if the economy is changing, we must too. As a community college, it's our job to prepare our students for transfer or the workforce. Our students enroll because they see us as a stepping-stone on a path to a better life. Most of our students don't have the luxury of "finding themselves." They need jobs and degrees. Indeed, 71% of our students at West plan to transfer to a four-year college or go directly into the workforce (WLAC college data). The sacrifices they make for their education are expected to lead to tangible outcomes: employment or transfer. So our teaching must reflect the changing needs of the marketplace even more than at a traditional institution's would.

Nowhere do we feel that creative urgency more powerfully than in Los Angeles, from SpaceX, to the entertainment industry, to Silicon Beach. I invited several executives from these industries (entertainment, architecture, design, fashion, aerospace engineering, info tech) onto my advisory board, and they have all confirmed this creative imperative. They want their future employees or interns to be creative, and demonstrably so. As Victor Hugo observed, "An invasion of armies can be resisted, but not an idea whose time has come." In the marketplace, creativity's time has come.

This research satisfied me that at least on paper, the certificate would be beneficial to our students. Greater employment should lead to greater financial well-being, I reasoned. With my administration's blessing, I forged ahead and piloted four "creativity-enhanced" English composition courses at the college for the Winter 2017 and Spring 2017 terms.

Before I designed the courses, I wanted to know more about my students' challenges going into the program. As soon as I was given the directive to launch the creativity studies initiative last May, I asked my students (after grades were submitted and there was no pressure to oblige), if they would be willing to share with me any difficulties or obstacles that they faced in pursuing their education at West. Contrary to what I expected, their answers came pouring in. It turns out that they were very eager to share their stories.

Donovan Blount, a single father and Navy veteran wrote,

> When I decided to return to college, my son was three and I was working a full time graveyard shift at Fed Ex ground. The commute to work was an hour. This schedule made going to school very difficult. I would go to work at 10 pm, get off at 7 am, rush home to take my son to day care for 8 am, head to school for my 9:35 am class, then after I finished school at 2:00 pm, go pick my son up from day care, go home and do it all again. Notice I left something out: sleep. It is nearly impossible to get quality sleep with a three-year-old running around the house causing havoc.

Despite, this grueling schedule, Donovan graduated magna cum laude and transferred to UC Berkeley last fall.

> Another straight-A student Andrea wrote me:

> When I was eight, my mother passed away from lung cancer. Then, shortly after, my father died. I felt alone and desolate. I was an orphan who had nothing to give to the world and no potential. I never knew how I was able to get past my difficulties but I know that I owe my success to my teachers who would stay after hours with me to help me. I always supported myself. Since 10th grade I have worked three jobs and I go to school full time.

Andrea is transferring to Berkeley this fall. Another student Jaime Garcia Sandoval (who was just accepted to UCLA) wrote:

> I had to take on another job, which was difficult since I was taking four classes on campus and one online. I would wake up at 7 AM and go to my job at the mall, get off at 12, rush to school, change in

> my car, and get to class by 12:15. I would be finished with my classes around 7:15 PM, so I would jump in my car and rush downtown to catch another shift at work from 8 PM to 1 AM, then go home and repeat. I wish I could tell you how I did it, but I really don't know. It was an awful cycle and it left me exhausted. Somehow, I managed to get straight A's. I'm very proud of how I managed to make things work. Whenever I'm going through a hard time with work or school I just remind myself that if I could handle all that, I surely have it in me to handle whatever is happening at the moment.

I find these statements and these students incredibly inspiring. As Henri Matisse observed first hand, creativity *does* take courage. But rather than feel defeated and overwhelmed by their challenges, these students rose to meet them, showing the creativity traits of flexibility, resiliency, resourcefulness, and perseverance. And these are not students barely scraping by, these are "A" students who sit in the front row, and participate, and come on time to every class. If I had not asked, I would never have imagined their struggles.

Redefining Adversity as a Training Ground for Creativity

> *"Keep your eyes on the stars, and your feet on the ground."*

> Theodore Roosevelt

What if, instead of being a disadvantage, challenging life experiences were actually an *advantage* when it came to creativity? If we generally agree on the following creativity traits: originality, flexibility, perseverance, resilience, comfort with the unknown, intrinsic motivation, and the ability to tolerate the risk of failure, we may begin to see that these traits are honed *only* by facing tough challenges. The research suggests that it is precisely when limits are imposed, that creativity can flourish. According to creativity expert Molly Holinger (2016),

> Creativity, which as a discipline favors abundance over scarcity, paradoxically thrives upon limits. In a sense, limits allow creativity to happen; they define creativity in that creativity often means manipulating limits in a previously unforeseen way. . . Johnson (2010) wrote about the "adjacent possible," showing how innovation happens when the accepted boundaries are expanded into what's currently possible, a space that is not unlimited." (p. 104)

Because reality has limits, creativity, when put into practice, must accommodate those limits and work within or around them. Perhaps that is what my students have demonstrated. When we have less time, we become more efficient and more productive, and we value the time we have more. Maybe a tough environment is actually the *best* training ground for creativity.

And if adversity may be excellent training for creative problem solving, what these community college students have shown is that they may actually be much *better*-poised to capitalize on the systematic learning of creative problem solving than traditional students because they have *already* been developing creativity skills by the very nature of their experiences and the constraints that have been imposed upon them.

If designer George Lois is correct that "Creativity can solve almost any problem," it follows that in order to be creative, you <u>need</u> the problem. If the research suggests that it is precisely when limits are imposed that creativity can flourish (Holinger, 2016), then limits allow creativity to happen. In other words, there is no "outside the box" without the box.
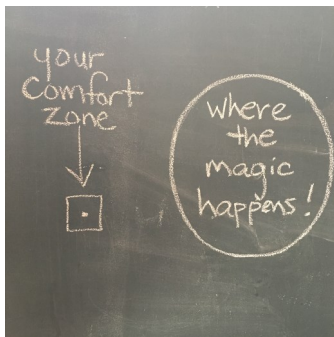
The majority of our students have always been outside of their comfort zones. And that is where growth happens, the magic. What do you do when you lack resources? You become <u>resourceful</u>. You adapt. You become resilient and self-sufficient. What do you do when you have no model? If no one in your extended family has ever attended college? <u>You must create a new model where none has existed before</u> – and isn't that the very definition of creativity?

About the creativity required in being a first generation college student, Mandy explains:

> I'm the first to graduate high school. I know I have the drive to excel in college, but given no one in my family ever did, it took countless affirmations that I was good enough and deserved an opportunity to thrive. As I look back I think of all the struggles; and I think to myself, it is all worth it! I chose to believe in myself and be my own definition of success...I plan to teach and pay it forward by instilling the beauty of higher education in those who rise to the occasion.

Our students *do* rise to the occasion. And if challenging life experiences are indeed an advantage when it comes to creativity, awareness of this advantage might help reframe our students' self-image and their strengths, and thereby not only increase their economic, but their emotional well-being as well.

What strikes me along with their courage, is that many of our students report that "they don't know how they did it." What if they *did* know how? What if we taught them to consciously cultivate those creativity skills? How far could they go then?

Redefining "Failure"

> *"I have not failed. I've just found 10,000 ways that won't work."*
> Thomas Edison

Through creativity studies, we can help students to reframe setbacks as an important part of their path to ultimate success and life balance. Indeed, trial and error forms the basis of every innovation and its benefits have been well-documented in scientific inquiry. Why should school or life, for that matter, be any different? About his ability to overcome failure, my student Luis shared:

> I failed my first semester. I lacked the skills necessary. I wasn't going to return, but I had a change of heart. I re-enrolled. It was very hard. It took me 4.5 years to get my Associates Degree. I've even sold my blood plasma numerous times to afford school. What helped me succeed and continues to help me, is that I had a great math teacher. I was accepted to: USC and all of the UC's. Now I am double majoring in Mathematics and Aerospace Engineering. I plan to get a PhD. My failures have not kept me back.

Imagining a Better Future

Not only are these students able to tolerate failure extremely well, but they are also able to create new paradigms. Time and again, one of the most impressive ways that community college students demonstrate creativity is in their ability to imagine a better future for themselves than the realities they are currently living. Cindy's narrative demonstrates this well:

> I always remind myself that I can become who I want to be to give my family a better future. What is going to make me happy is to be able to contribute to the world. The challenges have made me stronger and a better student. My drive and motivation are much stronger than anything. I just keep moving forward and don't look back.

James seconds her emphasis on the need for education in imagining his better future:

> It's only through education that one can truly transcend. I have student loans and I'm living month to month trying to make ends meet, but I wouldn't do anything differently for I'm investing in the future and the person I know I can be.

The trap of addiction, because it enables an escape from a bad current reality while simultaneously perpetuating a hopelessness to change reality for the better, is present among our student body. However, as the following testimonies demonstrate very powerfully, our students find a creative way to transform this paradigm through education instead. Jorge, one of my strongest students, shared:

> I became addicted to methamphetamine (circumstances at work, compounded with my father's death). It took me a year to realize that I was either going to die, or end up homeless (I had quit my job and had exhausted my savings). I found a picture of a much younger, and happier me and decided that very moment that I was going to change. It took me six months to regain my sanity. Lacking a degree, there was no doubt that I needed to return to school. I am pursuing a nursing degree.

Similarly, Devon wrote,

> I am a recovering alcoholic and drug addict. My life became, quickly, one of the darkest and most hopeless. How this ties into college – I found myself in front of an open door. It was a door of opportunity, as exciting as it was intimidating. I had come to think of myself as unintelligent, uninspired, and useless. While I knew I wanted an education, I didn't know if I was worthy or even good enough. I mustered every bit of courage to enroll and continue and I am so thankful I did. Those were the demons I faced before WLAC. I have been sober for close to 3 years and have since come to believe I am good enough, smart enough, and worthy enough of an education (*Emphasis mine*).

These creative responses heartened me because I suspected that the sense of self-worth and empowerment that students get from their education promised to be even further enhanced by creativity studies because creativity studies would make students aware (rather than ashamed) of their struggles. The rewriting of their narrative must lead to increased self-esteem, and well-being. But only the pilot courses would tell.

Creativity Studies and Well-Being: Results

What were the results? After taking a pilot creativity-enhanced English class in which students read Mihaly Csikszentmihalyi's *Flow*, discussed creative problem-solving (CPS), the FourSight creative personality types, took the Reisman Diagnostic Creativity Assessment and wrote about their findings, maintained "Creativity Journals" and wrote formal essays on their own creativity, 115 out of 149 students in the pilot classes said emphatically "yes!" to wanting a Creativity Studies Certificate. 77%, once taught about creativity, want more.
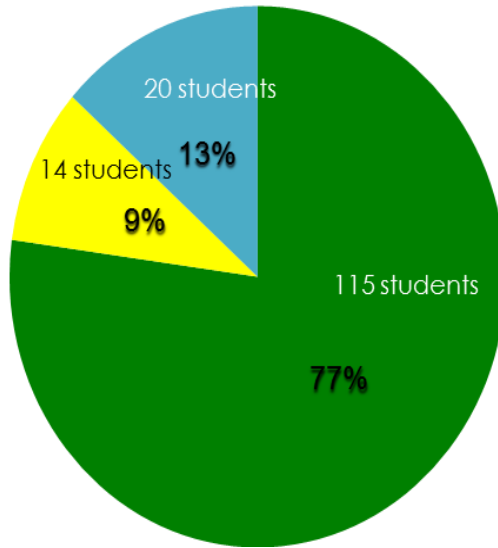
This makes sense.

In the process of teaching these "creativity-enhanced" courses, what I saw firsthand was that learning about creativity studies in class had a very positive effect on students and clearly and consistently led to a greater sense of well-being.

Let's first establish what we mean by "well-being." The definitions of "well-being" are perhaps as varied and sundry as lay definitions of creativity are, but examples might include improved school work or intellectual curiosity, sound mental health or the wherewithal to seek help if needed, a sense of happiness, renewed or greater goals, increased motivation, a heightened sense of life purpose, a willingness to take life-enhancing risks, good and supportive relationships with family, friends, and/or significant others, sound physical health and the pursuit of activities that make a mind-body connection, such as yoga, martial arts, and meditation that may lead to increased focus throughout the day.

Anecdotally, I could see the positive effects this work was having. One student felt prompted to seek therapy for a divorce he was having difficulty overcoming. One gave a class presentation on martial arts with an enhanced realization of how it had had a positive impact on her life. One gave a class presentation on creativity and the PTSD he was battling. Another talked about his heart condition diagnosed at the age of 18, and how he was committed to a creative response to live a life with meaning. After reading Csikszentmihalyi's *Flow* in class, another student emailed me:

"Professor. I just wanted to let you know how powerful your class was today. I really appreciate that you chose a book that will really

have an impact on people's lives. Honestly, at one point in your lecture, I started to tear up. So, if I ever avoid eye contact, it's not because I am not listening, I'm just holding back the tears! My story is similar to many as it is filled with a lot of pain, struggle, acceptance, determination and wonder. Things you were discussing today really hit me. I think it's so important for educators to take advantage of the stage they have been given. Some of us are going to school not only for an education, but also for guidance."

MY BALANCE WHEEL

Mallika Chopra, *Living with Intent*

In her book, *Living with Intent,* Mallika Chopra includes a balance wheel of all the components of a fulfilling life. Although we, as educators, have been taught to focus on only 2 of the 7 aspects--work and intellectual stimulation—how powerful might it be if we expanded the wheel to include life skills like creativity and sense of purpose?

It is important that these topics be discussed in a classroom setting so that students have a vocabulary with which to discuss the creative experiences they are having and can further develop their creative potential. At the Creativity Expert Exchange in Buffalo (2016), creativity expert Mark Runco stated that divergent thinking is a useful estimate of creative *potential*, but not necessarily of creativity. Divergent thinking provides ideas, but training and awareness of the principles of creativity are the switch that when flipped allows truly creative problem solving and expression to emerge fully. And flipping that switch for our students would have a positive impact on their lives. According to Holinger (2016),

Essentially, creativity provides a valuable emotional skill that helps with difficult situations through optimism and perseverance. Likewise, those who show resiliency in other areas of their lives are more apt to integrate these skills into their creative process. (p. 102)

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So creativity makes students better able to handle life challenges, and those students who demonstrate creativity traits like resiliency and risk-taking are more creative and have more ideas. Put another way, creativity helps students handle life challenges, and life challenges require students to be more creative. It's a win-win.

Creativity is also a win-win for students' emotional well-being. Seligman's Positive Psychology model, PERMA posits positive emotion, engagement, positive relationships, meaning, accomplishment or achievement as the elements of positive psychology that dovetail beautifully with creativity skills. Positive psychologist and co-founder of the PERMA model, Mihaly Csikszentmihalyi (1991), agrees: creativity leads to happiness and a better life. Likewise, happy people are by definition more creative (*Flow*). "[R]esearch has proven that creativity and positive emotion can be enhanced through deliberate practice (e.g., Scott, Leritz, & Mumford, 2004; Seligman, 2006)" [Holinger, p. 104]. Holinger (2016) also observes that "Huppert and So of the University of Cambridge . . . include three additional characteristics of well-being: *resilience, vitality*, and *self-determination*," (italics original, p.102). They suggest resilience strengthens with practice. And Holinger (2016) makes the link between creativity and positive psychology very clear:

> Experiencing this process of small failures, which lead to small successes, which lead to big successes, bolsters optimism. As argued by Kelley and Kelley (2010) in *Creative Confidence*,
>
>> Once you have gone through enough rapid innovation cycles, you will gain familiarity with process and confidence in your ability to assess new ideas. And that confidence results in reduced anxiety in the face of ambiguity when you are bringing new ideas into the world. (p. 49).
>
> Positive emotion can help in embracing failure and coping with mistakes. Fredrickson's (2004) 'broaden and build' theory asserts that positive emotions build resiliency and lessen any 'lingering negative emotion' (p.1371) toward past failure or trauma. (Holinger, p. 102).

By teaching creativity in college, we can multiply the instances in which creative responses can be practiced, thereby giving our students the tools to be happier as they earn their degrees. Fredrickson and Seligman (2006) all posit that when you feel better and experience positive emotions, you create more and have the energy to come up with more ideas. Ideation flourishes. Conversely, the process of being creative sparks positive emotions.

Perhaps the new model of creative education should include happiness and self-expression as the most important goal. As Logan LaPlante famously said in his TEDx Talk "Hackschooling Makes Me Happy," "When I grow up, I want to be happy." LaPlante's fresh and creative look at what the true goals of education might be, and how they might be achieved in creative ways, expands the definition of what we do as institutions of higher learning and as educators. It also causes students to look at their long-term life goals in

pursuing education and encourages them to take ownership of that process in ways that improve self-confidence and agency. What my students demonstrated over the past two terms is that they are passionately interested in creativity and that a tough environment might just be the best training ground for creativity.

Campus Response

The campus response was also very exciting. On May 13, 2017, Mihaly Csikszentmihalyi graciously accepted my invitation to come to campus and give a keynote address on Creativity and Flow at our first annual WEST TALKS Creativity Conference: "The Creative Edge" in a day devoted entirely to TED Talk-like presentations on creativity in many different disciplines. After having read *Flow*, this was a day the students will never forget. Faculty and students gave talks alongside speakers from our surrounding industries including Disney, SpaceX, Virtual Reality, Improv Comedy, Advertising, Architecture, Environmental Philosophy, Communications, to an audience of 300 attendees. 50 student volunteers from the new Creativity Club and the well-attended Creativity Focused Inquiry Group came together to make this an incredible and meaningful event attended by the general public, the press, our college president, college trustees, students, faculty, and staff. Everyone came together that day to proclaim that creativity was important to them and worth discussing. This energy will extend into next year as during the conference we were able to announce the results of a college-wide vote that selected Csikszentmihalyi's *Flow* as our "One College, One Book" reading selection for 2017-18. This means that faculty will read the book and assign it in their classes and the campus will have monthly events around flow and creativity throughout the year. I also established a well-attended monthly speaker series around different topics in creativity. (If you had told me ten years ago that I would have a packed room of administrators, staff, faculty, and students meditating together in a demonstration on "Meditation and Creativity," I never would have believed it).

Creativity and Positive Self-Image

And yet, despite the creativity they have so amply demonstrated, our students don't often share their inspiring stories because they feel ashamed of the adversity they have faced. This needs to change. This is the revolution I am talking about. Through teaching creativity, we can help our students realize just how truly resourceful they are and to feel pride about the creative ways in which they have responded to life. Giving them a forum in class in which to analyze and discuss their creative process is the first step in overcoming their shame and increasing their self-esteem.

To correct that incongruity (the fact that they have accomplished truly amazing feats of creativity, but feel shame rather than pride around the

experiences and their own stories of them), I asked my students after the "creativity-enhanced" pilot courses were over, whether or not they felt that creativity studies had contributed to their well-being in any significant way. Again the responses were overwhelming. I have included just a few to give you an idea.

One of the most meaningful shifts that occurred for students after studying creativity and applying it to their own lives was in their sense of self. As you will see, the students consistently gained self-esteem and a new, more positive self-image that they were able to take with them out of the classroom once the class was over. One student, Hwan, was able to come out in the classroom as a transgender male. He said to me in an email communication: "I always thought there was something different about me or wrong. Now I realize I was just creative." This was a life-changing moment for him and for the class. He wrote of it:

> "Learning about creativity helped me realize my life was one that was creative. I realize that the part of me I was ashamed of, was something I should be proud of. Without creativity studies I would not have had the courage to say proudly that I am a transgender man. I want to thank my professor for introducing this new way of thinking into my life." Hwan Michael Moore

Moreover, as a result of the positive reception he got in the classroom, he felt emboldened to share his story with the college at the creativity conference we held on campus. His talk moved the entire audience.

Self-Image, Self-Consciousness, and Life Themes

This expanded definition of creativity to include themselves (where previously they did not see themselves as creative) is common to most of the students and improved their self-image. Like Hwan, another student Selma also had the experience of enhanced self-image as coming from an inner source of strength and a clearer sense of meaning and purpose in life, rather than coming from extrinsic sources. This resulted in a reduction of self-consciousness and self-criticism. She also mentions a more positive outlook on life and life challenges when seen through the lens of creativity and life themes or life purpose (a topic I had asked students to consider and write about in class). Significantly, this shift occurred only once she was able to expand her definition of creativity through class:

> "It never occurred to me that I am truly creative. I have never seen myself as creative, but I was under the impression that those who are creative could only be artists, singers, dancers, and everyone in fine arts. [But] [c]reativity as defined in psychology, is the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others. This definition eliminates the direct relationship between creativity and art and broadens the spectrum to

creativity and everyday life. Everything and everyone in my life makes me creative.

Before this new insight to the definition of creativity I never thought about creativity; now it seems like I am constantly relating creativity to everything I do. Csikszentmihalyi says that no matter how much we enjoy all activities in our life, we will still become vulnerable to chaos if our activities do not bring us toward our goals, and therefore the activities that go on in our lives have to have meaning (p. 214). Every single event that goes on in my life has to be meaningful; this has become my life theme. I love to make an adventure of everything. The last chapter of *Flow* resonated with me so much due to the fact that it helped me realize that my life theme is what makes me creative. I am constantly finding meaning in everything that goes on in my day-to-day life, from missing my bus to taking English 103 this semester. I begin to analyze, not overthink, and put all these events into a perspective that is much more positive than when my mentality was not in a state of 'I am creative.' It is a very empowering state of mind. Of course, I still have those days where I become extremely self-conscious and feel that everything is crashing down on me, but now that I have this mentality to fall back on, I can remind myself that tomorrow is a new day to create new meaning in my life.

One of the questions I continuously ask myself is, 'how does being creative help me live a happier life?' Csikszentmihalyi means when discussing the conditions of flow and using the 'Skill to Challenge' chart that if we are not being stimulated by the tasks at hand, then the tasks will become boring. When you realize that there is an enormous amount of creativity within you, you are more capable of adjusting a task to your skill level to make it more stimulating, enjoyable. The more creative outlets I can find in everyday tasks, the more I truly feel accomplished and satisfied at the end of the day. I have had autotelic experiences at work, while running, during an exam, as well as more personal experiences of feeling completely immersed in the activities to the point in which the time and the way I looked did not matter. When I accomplish something, it is not because I want people to notice me; it is because I am now constantly intrinsically motivated to better myself every time I get the opportunity.

With defining myself as a creative person my perspective on my education has changed. I have always been motivated to pursue higher education. Before creativity, my passion to succeed in my education was becoming wholly extrinsically motivated. I was scared of disappointing the people I care about. Now I can easily tell myself to ignore everyone and their negative comments or to not care what other people think or simply that my family is not going to

live my life, I am. Because I care about these people their opinions do matter to me, but they do not define the decisions I make for myself. My new intrinsic motivation is to better myself as a whole person with every step I take in furthering my education.

I also now see that every A and F is not as a direct reflection of who I am, but rather a point of reflection to see my strengths and weaknesses and improve myself from that. I want to be able to reflect on myself in positive and constructive ways, instead of beating myself up every time something does not go as planned. A creative outlook in your life is to see every opportunity to improve yourself and grow instead of seeing negative aspects and failures.

I have always been creative, and this new identity within myself will definitely help me achieve new and greater things. I feel like my self-confidence boosted up a couple of points. For me, I discovered that every single aspect of my life is what makes me creative because people can think alike, but no one can think the way I think, and no one will live my life the way I will. My goals are expanding and with creativity by my side, I have more meaning in my life and a whole new perspective on the creativity within others as well."

Goal-Setting around Life Themes

Another student Sandra echoed Selma's increased sense of clarity around life goals and purpose. She talks about the "Setting Goals" journal entry I assigned in which students thought about daily, weekly, monthly, and yearly goals and the small steps that would help them get where they wanted to go. I also asked them if these goals fit into their "life themes" and to consider organizing them that way. Sandra wrote:

"Hi Dr. Boutry!
I really hope that the administration at West realizes what a great program and opportunity you are pioneering. I plan to transfer soon, but I'd love to do all I can to help. I'll make it one of my goals to come back and get a degree in creativity once the program is instated.
Here's how creativity studies helped me: Sandra
I still am unsure about what I want to do with my life. But now, I am okay with that. Prior to studying at West, I felt like a failure. I had dropped out of UCR, disappointed my family, and disappointed myself.
What I learned at West, especially with creativity studies, was all about me. I felt empowered after and okay with failure.
I took the Reisman Diagonstic exam, and I learned that I'm afraid of the unknown and not much of a risk taker. I've set forth on a mission to be okay with what I don't know and to take risks. I want to live

openly and free. I'm not 'original', according to the exam, but I say good, because I can take bits and parts of other ideas and but them together and find solutions, something I'm good at according to the exam.

In our in-class discussion on Csikzentmihalyi and his book, *Flow*, I've learned how to lead a fulfilling life through optimal experience. And, it works. The organization of the book keeps you waiting for the good part.

Hear is my quick run-down (and the better way to organize [the book *Flow*]):

- Have a life theme! My life theme, at the moment, is: Explore everything and never leave anything unsaid. Having a life theme is like an ultimate goal all your activities try to achieve.

- Do things you love & only one thing at a time. Essentially, fill your life activities and actually focus on just that. Forget what others think of you, throw your phone away, and immerse yourself in every activity. I like my job, it's not always the best, but when I focus on it; I have to pick up these dishes, take them into the kitchen and drop them off, wash my hands, take food from the counter to the table, and I get into this routine that doesn't break or stops and I feel good. The time flies by and my hard work is recognized.

- SET GOALS! This part is the hardest for me, but I'm getting better. Set day goals, week goals, month goals, and year goals that relate back to your life theme and stick to them. I've become better and it's given my life more direction. My month goal was to save money for Vegas, and that's done. My year goal, is to save money to go abroad. I want to go to Cuba for my friend's wedding. My week goals are to take time for myself and go dancing. My day goals are to finish homework for my online history class that is kicking my butt.

- And finally, have a journal. This journal is for everything. I write down my goals. I write down how I feel. I started counting my calories. I write all the places I want to visit in the US and abroad. I write poetry and short stories. I write down the name of songs I like and new band recommendations. I draw. And it all has to do with me growing and exploring.

Creativity studies helped a lot. The best part was the teachers. Dr. Boutry said that Junior college students face more adversity but

are just as brilliant as those in higher level colleges. It had been a while since I had a professor that loves what they do. I think the main part of creativity is fostering connections that help both ways. Creative people in your life make your life creative. Creativity studies really helped me and I really want to help people. So that's one of my life themes too. *** Sorry! I didn't know I had so much to write!

<div align="right">Sandra (email wlac account)"</div>

Risk-Taking, Tolerating the Possibility of Failure, and Being Adventurous

Another student Juderay talked about his increased comfort with taking risks and his willingness to be adventurous after discussing creativity studies in class and indicated how this new willingness on his part lead to a greater sense of well-being and pride in his accomplishment. Csikszentmihalyi (1991) suggests that memorization helps order consciousness and combat anxiety and chaos, and so I made it an assignment. To push himself in class, instead of simply reciting a poem or passage as was assigned, Juderay chose to sing his in front of the class of forty. He emailed:

To:	Katherine Boutry
Date:	Jun 24, 2017 03:59 PM
Subject:	How Creativity Studies Affected My Life

Before I was exposed to creativity studies, I was living my life in a bubble - a bubble I like to refer to as my "comfort zone". I had my routines, I knew my likes and dislikes, and was content to settle for (if I'm being honest with myself) less. But then I was introduced to Mihalyi Csikzsentmihalyi's *Flow*, and the messages within that book changed my outlook on how I see things. For me, the main message I got out of that book was this: to be creative is to be fearless. To put it in basketball terms, one has to be willing to miss a shot, but the true power lies within the bravery to take it. You don't know until you try. Often times, I feel like in life what holds people back is nothing but themselves, meaning that the ultimate control lies within the individual. I didn't realize the contents of the last sentence until I started reading *Flow* and was exposed to creativity studies on a regular basis. Again, you have to be fearless in order to achieve creativity. You can't be afraid to fail. Because of creativity studies, I've done things that (in a million years) I never thought I would have enough courage to do. For example, I got up in front of my English class and

sang the chorus of one of my favorite songs: New Edition's "Mr. Telephone Man", and although I still think it wasn't my greatest show of vocal ability, it's the willingness to try that I'm ultimately proud of. This story is one of many in recent days that involves me practicing the fearlessness necessary to be creative.

All in all, what I've gotten out of creativity studies is that growth doesn't happen inside of one's comfort zone, and that in order to lead a well-rounded life that is full of a myriad of experiences, one *has to be willing to try*, regardless of the outcome. The true power ultimately lies within the fearlessness that is associated with stepping into the unknown, rather than the results that may follow.

P.S. I hope you're having a great summer Dr. Boutry, and I wasn't kidding when I told you on the day of the final that taking your English 103 class was the most meaningful class I've ever taken. I've gotten more out of that class than I'd ever imagined, so thank you again.

All the best,

Juderay Almario"

Self-Esteem and Overcoming the Stigma of Victimization and Mental Illness

For another student Sabrina, creativity allowed her to rewrite her narrative of abuse and reframe her sense of self. Rather than see herself as a victim from her past, she was able to empower herself as a champion of children.

"Hello Professor,

I had a great time working on the creativity assignment. This assignment did encourage me a great deal, being a victim as a child I did have a few self esteem issues and I was able to share my experience and develop myself. The creative activity assignment, actually the whole experience, put me in the place of my students. Even though I teach children, I never considered myself to be very creative, but more and more I am learning how to be. This experience and your class has sparked

my muse....Thank You!

Sabrina"

Similarly, a student who had struggled for many years with PTSD and mental illness was able to rewrite that narrative as a new creative outlook he found "liberating."

Date:Jun 22, 2017 01:53 PM

"From: Kevin

To: Katherine Boutry
Date: Jun 22, 2017 01:53 PM

Professor Boutry,
Having encountered the Creativity Studies portion in the English 103 Class was a major turning point for me, in that it allowed me an opportunity to expand upon the concept of free-thinking, and free expression that was quite liberating.
I think that by taking that "One Step Beyond", in being unconventional, abstract, and out of the box, the class was the best English class I've taken. I think that your approach is way ahead of other instructors, as it's more in step with the times (more real). I especially liked being given the opportunity to present a poster and discuss Creativity & Mental Disability, as it can definitely serve as a point of illumination into an obscure, not talked much about aspect of society. So definitely creativity has served as a launch pad into further original, and "cool" thinking and innovation. ”

Aligning Life Choices with Life Theme for a Greater Sense of Purpose

Finally, a student Carrie was able to take creativity studies to get herself back on track and to remember the person she wanted to be by realigning her life choices with her life purpose.
“To: Boutry, Katherine
Tuesday, June 27, 2017 3:44 PM
Carrie:
Thinking about creativity in class honestly brought me back to myself. I have been attending community college for a couple years. During that time, I have been homeless, jobless, sick, bedridden for six weeks from an emergency surgery, in a car accident and have been unsuccessful in my attempts to find a therapist who can help guide me through the pain that I am still trying to overcome from my past. I have been doing well in school, but I lost myself. For some reason, the past few years were more focused on catching up from all the little bumps in my road to happiness. I knew I wasn't me, but I thought the person I had become was good enough.

Taking English 103 with Dr. Boutry was seriously life changing. We took the Reisman Diagnostic Creativity Assessment and I quickly started to remember who I was. At first, the results were very shocking to me. I couldn't understand why my extrinsic motivation results were so high. I thought of myself as completely giving and never needing anything in return, but no matter how many times I took the test, I received the same results. I started to break down my life and figure out what was happening. I started to learn so much about who I had become. I didn't like it. The results kind of snapped me out of being in my cloud. On the outside, I'm sure I still smiled, but I

could feel my energy had been different for a very long time and for some reason I just couldn't project positivity like I had in the past. I was so focused on getting good grades because it was the only thing I thought I could control. I forgot I needed to balance that dedication with activities that created a flow of happiness. That one simple test really opened my eyes back up. The rest of the semester I felt a lot less stressed and my classes even seemed easier. I also started being more social and not worrying so much about things. With a better mind-frame, I noticed there weren't as many problems as before.

The creative way Dr. Boutry was able to teach us really impacted my life. That's what teaching should be about. That's why I think that creative studies can only help people. Sometimes we get so wrapped up in all the hard parts of life, that we forgot how much control we do have. We forget to let our minds wander and find ways we never thought existed. There are so many things to be learned from creative studies. My English class just dabbled in creative studies, and my life really improved dramatically. Imagine all the opportunities that are missed because people are stuck in one way of thinking. Creative studies can be applied to every area of life, so it's a wonder that a class doesn't already exist and isn't required."

Conclusion

These few representative responses establish a strong link between studying creativity in the classroom and increased student well-being. They also demonstrate that the students themselves are aware of the positive impact that creativity studies had on their overall well-being, improved self-image, self-confidence, and self-esteem. If being inherently creative is the one advantage we can assert our students have in a world in which they are largely categorized as "disadvantaged," doesn't it make sense to help them capitalize on it? Recognizing their strengths, we want our students to realize just how inspiring and creative they are, and to encourage them to feel pride about the creative ways in which they have responded to their life challenges. Made aware of, and consciously cultivating their creativity strengths (as the students above have done), our students will be happier and healthier for it. In an era in which anyone can fact-check, it becomes incumbent upon learning institutions to nurture life skills along with knowledge. Creativity is just such a learning and life skill, and its contribution to student well-being undeniable.

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CHAPTER FOUR

EMPOWERMENT AND CREATIVITY THROUGH COOPERATIVE CONTROVERSY

PENNY HAMMRICH, JESSICA CELLITTI & JONAN PHILLIP DONALDSON

ABSTRACT Conceptions teachers' hold about the nature of science have a direct impact on their practices and thoughts regarding doing, understanding, and teaching science (Smith, 1990; Kearney, 1984; Lakoff & Johnson, 1999; Kincheloe, 2003). Helping students in teacher preparation programs to engage in critical and creative reflection regarding their conceptualizations of science is a crucial aspect of preparing the next generation of teachers to cultivate conceptualizations of science more closely aligned with those held by scientists (Meyer, Shanahan, & Laugksch, 2005) and to engage their students in transformational critical constructivist learning (Kincheloe, Steinberg, & Tippins, 1999). Cooperative Controversy is a creative instructional strategy which has been shown to be an effective approach to engaging students in critical reflection, often leading to conceptual shift and enhanced critical thinking (Jacobs, 2010; Hammrich, 1998). This chapter will analyze the impact of using cooperative controversy to engage students conceptual understanding of the nature of science through empowerment and creativity.

Keywords: conceptual change, nature of science, creative reflection, constructivist learning, conceptual shift, cooperative controversy

Empowerment and Creativity through Cooperative Controversy

Conceptions teachers' hold about the nature of science have a direct impact on their practices and thoughts regarding doing, understanding, and teaching science (Smith, 1990; Kearney, 1984; Lakoff & Johnson, 1999; Kincheloe, 2003). Helping students in teacher preparation programs to engage in critical and creative reflection regarding their conceptualizations of science is a crucial aspect of preparing the next generation of teachers to cultivate conceptualizations of science more closely aligned with those held by scientists (Meyer, Shanahan, & Laugksch, 2005) and to engage their students in transformational critical constructivist learning (Kincheloe, Steinberg, & Tippins, 1999). Instructional strategies aimed at facilitating conceptual change are the subject of increasing research interest (diSessa, 2014; Kalra & Baveja, 2012;

Sinatra & Chinn, 2012; Vosniadou & Mason, 2012). Cooperative Controversy is a creative instructional strategy which has been shown to be an effective approach to engaging students in critical reflection, often leading to conceptual shift and enhanced critical thinking (Jacobs, 2010; Hammrich, 1998). This chapter will analyze the impact of using cooperative controversy to engage participants' conceptual understanding of the nature of science through empowerment and creativity.

Theoretical Framework

This study used a theoretical framework in which the cooperative controversy instructional strategy was positioned as a learning activity for conceptual change regarding the nature of science with the aim of increasing the empowerment, creativity, and wellbeing of pre-service teachers and their future students through transformational learning. This theoretical framework integrates aspects from the literature in conceptualizations of the nature of science, conceptual change, transformative learning, critical pedagogy, constructivist learning, creativity, and wellbeing.

Science Conceptualizations

While research indicates that Americans have an interest in science, when looking at their genuine understanding of science, The National Research Council (1996) found that 64% of the two thousand adults surveyed lack any understanding of the nature of science. McComas, Clough, & Almazroa (1998) found that the reason for this is due to what is emphasized in science teaching and science textbooks nationwide: simple recall of basic science content. Traditionally, science teachers and science curricula have neglected the knowledge-generation process, which is core to science literacy. In our dynamic, global society, science literacy is not only required for students pursuing STEM careers, but it is essential for the average citizen to make truly informed decisions about everyday issues that impact the environment, the society, and future generations (Espinoza, 2011). Science literacy is defined as "the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity" (NRC, 1996, p. 22), which is necessary for future citizens, and in turn, prospective science teachers.

The push for science literacy is not new and has been emphasized for decades, as The Advisory for Science Education for The National Science Foundation (NSF) declared in 1970 that science education needed more "emphasis on the understanding of science and technology by those who are not and do not expect to be professional scientists and technologists" (Report, 1970, p iii). Since then, national policy documents have called for scientifically literate citizens and students, not only the creation of future scientists

and engineers (NRC, 1996, 2007, 2009, 2012). Most recently, the Next Generation Science Standards (NGSS Lead States, 2013) were released and grounded in the principle that "students need to develop a shared understanding of the norms of participation in science" (NRC, 2007, p. 40), including an understanding of the nature of science as involving multiple possible interpretations, openness to revision, and collaborative construction of meaning (NRC, 2007, 2012). This is particularly important because there is a popular conceptualization of the nature of science as involving truths about reality, natural laws, and experimentation which proves facts (NRC, 2009).

Conceptualizations around the nature of science have been widely used in independent research studies for several years (Lederman & Lederman, 2014; Lederman, Abd-El-Khalick, Bell, & Schwartz, 2002; McComas, 2008, 2014; Niaz, 2009; Osborne et al., 2003). In comparing these conceptualizations, Kampourakis (2016) has identified "general aspects" (p. 670) or commonalities that run throughout each list. For example, observations, interpretation of data, creativity, the subjective nature of science, and the idea that scientific knowledge is tentative and able to change are some of the ideas that he refers to has the "consensus view of the nature of science" (p. 669). While there is extensive empirical evidence to support this consensus view, there are also several critiques to looking at the conceptualizations of science in this narrow view (Allchin, 2011; Dijk, 2011; Irzik & Nola, 2011; Matthews, 2012). This emphasizes the importance of engaging prospective science teachers in cooperative controversy in order to elicit conceptual change, as Hodson (2014) explains, it's not only scientific knowledge that is tentative but all knowledge and knowledge generation requires creative thought.

One common misconception in K-8 science education surrounds students' understandings regarding the phases of the moon. According to the NGSS, students should begin to investigate this conceptualization as early as first grade as the specific standard states: "Use observations of the sun, moon, and stars to describe patterns that can be predicted" (NGSS Lead States, 2013, 1-ESS1-1). This concept is again revisited in fifth grade when students are expected to "represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky" (NGSS Lead States, 2013, 5-ESS1-2). Even with lessons attempting to meet these standards, the majority of students come to middle school with misunderstandings. This may be revealed in students thinking the phases of the moon are caused in one of the following ways: (1) shadows of objects in the solar system, (2) the shadow of the Earth, or (3) the moon moves into the Sun's shadow. When middle school science teachers encounter any (or all) of these misconceptions in an attempt to achieve their own required moon-related standard, which states: "Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons" (NGSS Lead States, 2013, MS-ESS1-1), they may be unsure how to progress or they may simply correct the students thinking. The problem here is that this alone will

not lead to conceptual change and teachers need tools, like cooperative controversy, to engage students in a dialogue that will encourage them to rethink pre-existing conceptualizations surrounding science content.

Conceptual Change

Conceptual change learning has been a predominant trend in science education over the last 25 years, based on the foundations of constructivist understandings of the nature of science. Conceptual change researchers argue that conceptual change is crucial to learning science (diSessa, 2014). Sinatra and Chinn (2012) described science learning as a conceptual change process: "students come to the study of science with not only misconceptions about science content but also misconceptions about the nature of knowledge, thinking, and reasoning that must be overcome" (p. 276). Conceptual change is complex because it involves changes not only in cognitive processes, but also in attitudes, beliefs, epistemic stances, identities, and metacognition (Vosniadou & Mason, 2012). Changing one's conceptions does not happen easily. Acquiring new knowledge through traditional science instruction and/or simple discovery learning is not enough to produce conceptual change in the learners' scientific understanding (NRC, 2007). As Krist (2016) states, "developing knowledge-problematic epistemologies requires taking on an active role as a knowledge builder" (p. 370). This involves a radical transformation in learners' conceptualization of knowledge and learning. The transformation entails going against deeply entrenched positivist assumptions and practices throughout society.

Most educators are not adequately prepared to teach for conceptual change. "They hold transmission-oriented views of learning that are rather limited, particularly if seen from the point of view of recent conceptual change research" (Vosniadou & Mason, 2012, p. 232). This lack of educators' preparedness to teach for conceptual change leads to students acquiring new knowledge that lies in a vacuum of understanding. New knowledge is never challenged and students are not encouraged to engage in critical and creative reflection regarding their conceptualizations of science. "Teachers' views of teaching and learning are so limited when seen from a conceptual change perspective that it becomes apparent that the teachers themselves need to undergo a process of pedagogical conceptual change" (Vosniadou & Mason, 2012, p. 233). Teachers need to help facilitate students appreciation that scientific understanding and explanations can be challenged and can be revised based on new evidence and critical and creative reflection of new knowledge to formulate new and better models of understanding and knowledge transformation (NRC, 2012). The approach to new knowledge generation is a critical part of conceptual change.

Teaching for conceptual change is an involved process of creating an environment where students' prior knowledge is challenged through disso-

nance strategies that causes a cognitive conflict in their current understandings to foster conceptual elaboration and conceptual restructuring of understanding to create new conceptual knowledge (NRC, 2012). Studies have noted that when student teachers participate in a cooperative controversy instructional strategies they undergo transformation of knowledge that lead to empowerment and creative thinking (Hammrich, 1998 and Davis-McGivony, 2010). Only in this way will students unlock the vacuum of knowledge that they cling to as their understanding or way of knowing.

Empowerment, Creativity, and Wellbeing

Transformative learning (Dix, 2015; Illeris, 2013), critical pedagogy (Kincheloe, Steinberg, & Tippins, 1999; Giroux, 2010), and constructivism (Bruner, 1996) share a number of foundational assumptions about learning. They see learning as an active process of construction and transformation which operates at three levels: 1) construction and transformation within the individual learner, 2) construction and transformation within the community of learners, and 3) construction and transformation of society. Knowledge is seen as an emergent property of these active processes, not objectified bits of information to be acquired by learners. Empowerment is a central aspect of in these educational theories. Empowerment begins with learner agency, an issue of great concern to early constructivist theorists such as Dewey (1938/1963), who wrote: "the fixed arrangements of the typical traditional schoolroom, with its fixed rows of desks and its military regimen of pupils who were permitted to move only at certain fixed signals, put a great restriction upon intellectual and moral freedom" (Ch. 5, para. 1). Sannino, Engeström, and Lemos (2016) argue that learner agency is a crucial component of any transformative learning environment. Giroux (2013) suggested that "what makes critical pedagogy so dangerous . . . is that central to its very definition is the task of educating students to become critical agents who actively question and negotiate the relationships between theory and practice, critical analysis and common sense, and learning and social change" (p. 157). The learner agency which leads to empowerment is not a state or condition, but rather a skill—the development of which requires nurturing through purposeful exercise and enculturation (Greene, 1995). Activities designed to help learners develop agentic skills involve critical reflection on one's own beliefs and critical analysis of "common sense" assumptions regarding the nature of reality, knowledge, and science (Kincheloe, 2003; Apple, 2014). They also involve collaborative constructive and critical activities (Kincheloe, Steinberg, & Tippins, 1999). Because these agency-nurturing activities encourage continual questioning of assumptions, there are areas of natural alignment with conceptual change activities (Krist, 2016; Vosniadou & Mason, 2012).

The learner agency and autonomy at the heart of critical pedagogy and transformative learning are related not only to empowerment, but also to wellbeing and creativity. Wellbeing and agency are intimately related.

Kaplan, Sinai, & Flum (2014) argue that agency is crucial to wellbeing: "the growing elasticity of organizations requires a parallel level of flexibility from individuals, as well as agency . . . [and therefore] the development of students' agency and capacities in exploring and forming their identity should be a central educational goal" (p. 245). Wellbeing on the societal level also depends on education geared toward helping learners develop agency (Bruner, 1996).

Agency is an integral aspect of creativity theories (Csikszentmihalyi, 1990; Cross, 2006; Runco, 2014). Empirical studies of creativity have supported the centrality of agency in creativity theories. For instance, Slåtten (2014) found that autonomy is a prerequisite to creative self-efficacy and creative production. Similarly, Mathisen (2011) found systematic promotion of agency and autonomy to be antecedent conditions to creativity in organizations. It is through this connection between creativity and agency that Velthouse (1990) argues "Empowerment and creativity are not the same phenomenon; however, they are complementary. They may be superimposed on one another" (p. 17).

Empowerment, creativity, and wellbeing are connected through their mutual dependence on agency and autonomy. Furthermore, this connection can be leveraged toward greater empowerment, creativity, and wellbeing through agency-building activities grounded in the transformational learning, critical pedagogy, and constructivist learning literature. Figure 1 depicts the central role of agency and autonomy, the development of which requires critical reflection, constructive activity, and conceptual change activity which contributes to development of empowerment, creativity, and wellbeing.

Figure 1: The agentic-centric pedagogy framework in this study
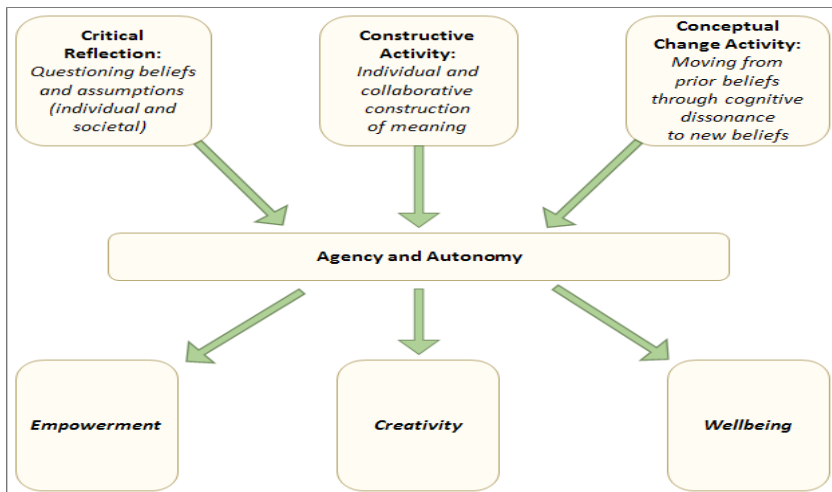
Methods

Context

Conceptions teachers hold about the nature of science have a direct impact on their practices and thoughts regarding doing, understanding, and teaching science. Helping students in teacher preparation programs to engage in critical reflection regarding their conceptualizations of science is a crucial aspect of preparing the next generation of teachers to cultivate conceptualizations of science more closely aligned with those held by scientists. There is a need for research investigating the design of interventions through which such conceptual shift can be facilitated. This study investigates participants' conceptualizations of science before and after engaging in a cooperative controversy activity. Furthermore, it will compare findings between participants who are students in a traditional teacher education preparation program and those in an alternative teacher preparation program.

Cooperative controversy is a debate-style learning activity designed to facilitate conceptual change, and has been found to be effective in many academic domains (Jacobs, 2010). The typical cooperative controversy activity is conducted in one class period and involves groups of four participants debating an issue in two-participant teams, switching sides to debate the opposing stance, and then coming together to reach group consensus (Hammrich & Blouch, 1998; Jacobs, 2010). Prior studies have suggested that cooperative controversy activities facilitate steps toward conceptual change, but not dramatic conceptual change (Hammrich & Blouch, 1998; Donaldson, Cellitti, & Hammrich, 2017).

Cooperative controversy is a form of critical pedagogy that leverages creative cognitive processes such as abductive thinking, perspective taking, and creative environment principles such as lowered inhibition and risk taking. This study seeks to evaluate the difference in impact (if any) of implementing the cooperative controversy instructional strategy between two differently prepared education majors. This study sought to answer the following research questions:

- What is the nature of conceptual change experienced by participants in an cooperative controversy activity?
- In what ways are conceptualizations of science different and similar between participants who are students in a traditional teacher education program and those who are students in an alternative teacher education program for non-education majors?

The study involved 22 participants, all freshman at a Northeastern Urban University. The participants were divided into two groups: those participants that

were in a traditional four year teacher education program and those that were in an alternative four year teacher education program. Both groups of participants participated in a cooperative controversy lesson designed to reveal and challenge their conceptions of the nature of science. The cooperative controversy lesson is designed to engage students in critical and creative reflection of their understanding concerning a concept. Figure 2 identifies the cooperative controversy activity.

Figure 2. Cooperative Controversy Activity
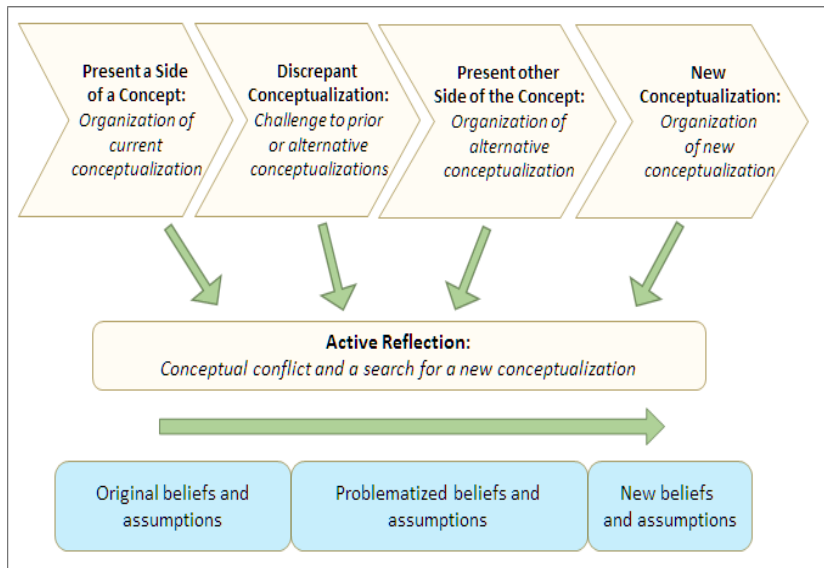
The cooperative controversy activity is designed to create a debate like situation where two sides of an issue are discussed and challenged creating a discrepant viewpoint (Hammrich, 1998). The goal is to come to a consensus between the two opposing views which creates uncertainty in understanding or the discrepant viewpoint. By seeking further information in order to come to a resolution between the two opposing sides, this creates critical and creative reflection of understanding on students own conceptions. Participants will either change their conception, shift their conception, or stay with their original conception. The successful use of the cooperative controversy has been reported in a wide variety of subject areas (Davis-McGibony, 2010; D'Eon & Proctor, 2001; Hammrich & Blouch, 1998; Johnson, Brooker, Stutzman, Hultman, & Johnson, 1985; Overby, Colon, Espinoza, Kinnunen, Shapiro, & Learman, 1996).

In the cooperative activity, participants were asked to write down their conceptions of the nature of science before and after participating in the cooperative controversy lesson. By doing this participants were able to reflect up-

on the conceptions they hold concerning the nature of science. Participants are paired in groups of four with two participants on each side of the issue. Each participant pair are given a written passage that describes one of the two sides of the issue and are asked to read, discuss, and write a persuasive argument defending the side they were given. Then the two sides engage in the cooperative controversy activity by each pair presenting and defending their side to the other pair. Participants are encouraged to ask questions during the presentation of each side. After each pair has presented their argument, the two pairs are asked to reverse roles and take on the other side of the issue to prepare and debate. The final goal for the cooperative controversy activity is to reach a group consensus or decision on the issue. Table 1 identified the cooperative controversy steps.

Table 1 (page 128). The steps involved in setting up the controversy:

1. Assign cooperative groups of four participants which is then further divided into pairs of two.
2. Participants meet with their partner, read their position and plan how to argue effectively for their position.
3. Each pair presents their position while the other pair takes notes and asks for clarification on anything they don't understand.
4. Open discussion takes place where each group argues forcefully and persuasively for their position, presenting as many facts as they can to support their point of view. Participants, as an entire group, are to make sure they understand the facts that support both points of view.
5. Role reversal occurs where each pair in the group argues the opposing pair's position. The goal is to elaborate on what was already said by the other pair.
6. Come to a group decision that all four of the group members can agree with. Summarize the best arguments for both points of view. When a decision is made the group organizes their arguments to present to the entire class. The group needs to be able to defend the validity of their decision to the entire class.

The question concerning the participants' conceptions of the nature of science was open ended and the responses were analyzed by the content analysis using the software Maxqda to look for patterns and trends on how students define the nature of science prior to and after the cooperative controversy activity. All three authors analyzed the responses to account for reliability of coding for patterns and trends.

Findings

Analysis revealed three findings relevant to the goals of the intervention (see Figure 3 for a summary of analysis).

Figure 3: Summary of raw data analysis
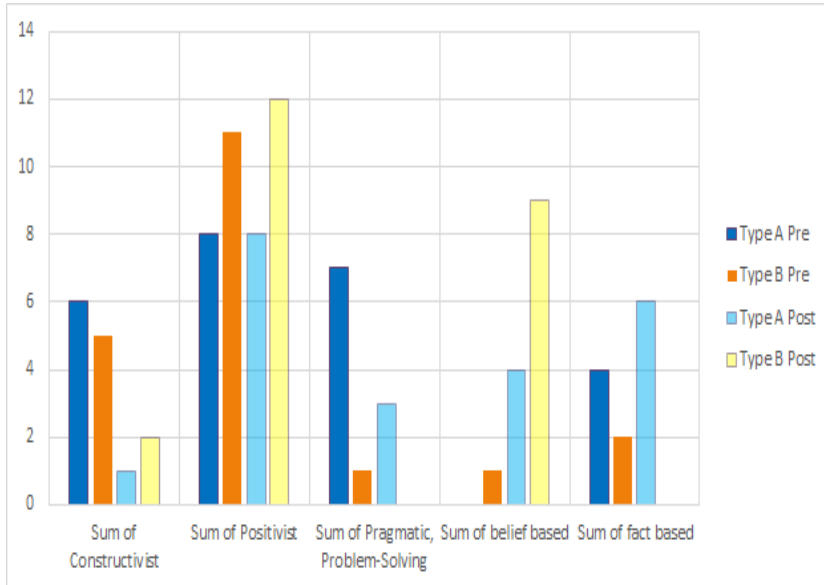
Type A is an alternative teacher education program; Type B is a traditional teacher education program.

The first finding was that in the pre-intervention data participants' beliefs and assumptions regarding the nature of science were simple (unproblematized). The second finding was that patterns in beliefs and assumptions prior to the intervention reflected the lack of understanding of the nature of science in the general population. The third finding was that beliefs and assumptions after the intervention indicated increased problematizing and cognitive dissonance.

These findings have several implications concerning the goal of the transformational learning intervention, which was to increase empowerment, creativity, and wellbeing. Because the theoretical framework suggests that these three outcomes are dependent upon increases in autonomy and agency, which can be developed through critical reflection, constructive activity, and conceptual change activity. The findings suggest that participants were meaningfully engaged in critical reflection as indicated in evidence that they were questioning their own beliefs as well as commonly-accepted beliefs and as-

sumptions in society. Post-intervention data revealed that participants had integrated meanings they had collaboratively constructed during the various stages of the cooperative controversy activity, suggesting that they engaged in constructive activity. Although participants did not report new beliefs after the intervention, there were strong indications of increased cognitive dissonance and problematizing of their prior beliefs and assumptions. This suggests that the cooperative controversy activity was an effective conceptual change activity, particularly in initiating the crucial process of facilitating problematization leading to cognitive dissonance. However, in the format used here—particularly in the short timeframe of one hour—the activity alone appears to be insufficient to result in conceptual change as defined by the construction of new beliefs.

The findings regarding critical reflection, constructive activity, and conceptual change activity suggest that this intervention facilitated increased agency and autonomy, and although empowerment, creativity, and wellbeing were not directly measured the literature in which the theoretical framework for this study was grounded suggests that the findings provide secondary evidence for increased empowerment, creativity, and wellbeing in these pre-service teachers.

Discussion

The participants came into the conceptual change activity with simple or naive (unproblematized) beliefs and assumptions about the nature of science. The intervention did cause cognitive dissonance in the participants beliefs and assumptions, however, the short timeframe of the intervention seems to indicate that time and reflection maybe a factor in constructing new beliefs and assumptions. While creating cognitive dissonance is an effective step in the process of causing a conceptual shift or change, it appears that reflection maybe a key factor in order to create a permanent conceptual transformation. Because we found increased learner agency, the cooperative controversy activity may be an effective way to increase empowerment, creativity, and wellbeing. Logical next steps for further research and exploration of participants conceptions of the nature of science is to investigate the impact of time on causing a conceptual shift or conceptual change as defined by the construction of new beliefs or assumptions. What the conceptual change activity does indicate is that before a conceptual transformation of beliefs and assumptions can occur, an activity needs to create a cognitive dissonance in participants understanding.

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CHAPTER FIVE

MAGIC, MADNESS, & MYTH: CREATIVITY REDISCOVERED

TARA GREY COSTE & CAROL NEMEROFF

Analysis of magical, cultural, and religious beliefs and practices reveals commonalities that are the foundation of thought processes at work in the everyday thinking of modern adults worldwide. Sometimes explicit, but often unconscious, these patterns of thought drive understandings, emotions, and behaviors across domains. Exploring the difference between inspiration and insanity, we must look carefully at the forces that draw that line. When creatives tell their stories, their audience actively participates in the storytelling experience. Its thought processes demand order and gain this structure by comparing the new with its deep knowledge so that unusual information becomes intelligible. Successful creatives reiterate and heighten the differentiation between crazy and creative: crazy is dysfunctional, creative is superfunctional.

Introduction

In our ever more connected world, those of us who want to optimize this wonderfully complex existence spend a lot of energy celebrating and embracing difference. This becomes especially important when we want to live in a way that ignites creative potential. However, to function effectively in this space, we must also identify points of similarity that allow us to reach across difference to come to common understanding. To our eyes, some important tools for how to come to connection can be found in exploration of our core belief systems. In particular, we will look at the realms of magic, madness, and myth. This examination will help us unpack how ancestral understandings of difference and power act as drivers of modern decision making and behavior.

Magic

Our starting point is just before the turn of the 20th century when anthropologist Sir James Frazer identified the "laws of sympathetic magic" based on indepth comparative analysis of magical and religious beliefs and practices from cultures worldwide (Frazer, 1959/1880). Rather than being limited to primitive societies, Frazer believed these laws to be universal principles of human thinking, and indeed, over thirty years of empirical research by Rozin,

Nemeroff, and other colleagues have documented extensive evidence of these principles at work in the everyday thinking of modern adults. Sometimes explicit, but often unconscious, these patterns of thought drive beliefs, emotions, and behaviors across domains ranging from dietary choices to health-related practices to perceptions of interpersonal threat and safety (e.g., Nemeroff & Rozin, 2000; Rozin, Haddad, Nemeroff & Slovic, 2015; Rozin, Millman, & Nemeroff, 1986).

The first of the laws of sympathetic magic, the *Law of Contagion*, holds that something that has been in contact with another thing may influence it through the transfer of some or all of its core properties, via a transmissible essence. This influence may remain after the physical contact has ceased and may, in fact, become permanent. This law provides the psychological underpinning for the scientifically validated biomedical germ theory. It is also the basis for the voodoo practice in which one attempts to influence a person by acting on an object s/he has been in contact with, through a now-shared essence.

Essence, and therefore contagion, may be negative or positive in valence. A familiar example of the law of contagion is the common reaction of wanting to wipe or wash one's hands after touching an object belonging to—or worse yet, shaking hands with—an intensely disliked individual, as though some nasty, contaminating substance rubs off through the contact. On the other side, people willingly pay exorbitant sums of money for objects formerly worn or owned by celebrities and value heirlooms as though they continue to hold the essence of the person from whom they were inherited, and/or the entire family lineage. The historical analog in traditional societies such as the Hua of New Guinea is that a person's "vital essence" is believed to reside in clothing he has worn and products in which he has invested effort (e.g., his garden, pigs, and children). Similarly, the Kai of Northern New Guinea believe that "everything with which a man comes in contact retains something of his soul-stuff" (Frazer, 1959/1880, p. 68). Among the Khoi-Khoi (Hottentot), the foods one eats were believed to transfer properties to the eater; for example, rabbit is to be avoided for fear of becoming fainthearted, while eating a lion will make one brave and strong (Crawley, 1902).

The *Law of Similarity* holds that things that resemble one another share fundamental properties through shared essence. From this perspective, an image essentially equals the object it represents. Therefore one can influence a source by acting on a representation of it and manifest or attract a thing by enacting a representation of it. To see this principle in action, one simply has to imagine burning a photograph of a loved one and watching it shrivel, blacken, and crumble into ash or, alternatively, throwing darts or sticking pins into the image of a disliked person. Another example is the time-honored sailing tradition of avoiding whistling on board a ship for fear of calling up a storm. (Whistling resembles the wind.)

The derivative *Law of Opposition or Opposites* is the antithesis of similarity, in that things that resemble one another are believed to naturally op-

pose or drive each other away. This is often apparent in folk medicine where cures for specific conditions are selected based on physical resemblance. For example among the Zande, fowl excrement was believed to cure ringworm because it resembles it (Evans-Pritchard, 1976/1937). Along similar lines in more modern times, in the 1980s pink birth control pills were initially rejected by indigenous Central American women who believed in the *hot-cold* or *humoral* theory of medicine, because pink was a warm, moist color which they believed would heat the womb, making it more fertile. Blue pills had to be supplied before buy-in was achieved as blue was seen as chilling and therefore able to dry and cool the womb (Harrison, 1992).

Of course, magic has both positive and negative applications. Magical systems involve both prescriptions (spells and rituals) and prohibitions (taboos), and feed on polarity and oppositions: good versus evil; white magic versus black; medicinal healing versus curse; spells versus counter spells; life, death, and rebirth versus soulless resurrection (e.g., zombies). The sun and the moon have opposite energies, and male and female energies are similarly opposed—indeed, the sun is often characterized as masculine and the moon as feminine. In general, opposites are kept well separated from each other *unless* the goal is to cancel out effects or generate balance, e.g., doing a ritual at the moment when sunset and moonrise co-occur in the sky. Conversely, young male initiates among the Hua refrain from eating "female" foods that are dark, furry, and ovoid or womb-shaped for fear of becoming feminized (Meigs, 1984). Thus, the idea of contrast is a distinct concept in magic as well.

Initially, anthropologists of the 19th century understood magic to be a primitive form of thinking that, in the course of human evolution, naturally gave way to religion and eventually science (e.g., Frazer, 1959/1890; Tylor, 1974/1871). The current understanding is very different. Magical thinking is understood to be a primary mode of human thought that can and does coexist alongside both religious and scientific thought, potentially complementing rather than being supplanted by them (Tambiah, 1990). While early anthropologists (e.g., Malinowski, 1955) described magic as failed science and false belief, more recent discussions (e.g., Horton, 1967; Tambiah, 1990; Subbotsky, Hysted, & Jones, 2010; Boyer & Walker, 2000) highlight the role of magical symbolism and narrative in providing a sense of meaning and freeing the mind from the constrictions of everyday reality to allow for imaginative, counterfactual thinking. For example, in a study conducted by Subbotsky and colleagues (2010), children aged four, six, and eight years old were shown movie clips from a Harry Potter movie. Half of the children saw magical scenes involving talking animals, wands and spells, flying brooms, etc., while the other half saw scenes containing only non-magical content. Both before and after watching the movie clips, all children took the Thinking Creatively in Action and Movement test (TCAM), and the older children also performed a drawing task in which they generated nonexistent objects that were subsequently rated for creativity. Across all measures, the children who had

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watched magical scenes scored significantly higher on creativity.

In fact, magic has long been associated with creativity (e.g., Arieti, 1976) —and with madness. These three constructs (magic, madness, creativity) have a complex and intertwined history. In many traditions, becoming a shaman or healer first requires a journey through one's own illness and/or madness (Eliade, 1960; Koss-Chioino & Hefner, 2006) while modern "white magic" is defined as intentional co-creation with the divine (e.g., Bailey, 1934.) Creative inspiration is described across many cultures and historical eras as resulting from contact with mystical or esoteric realms or entities: provided by outside agents such as muses or gods, striking like a lightning bolt from without, or drawn forth from the highest or deepest layers of one's soul or psyche. In ancient Greece, Plato described the "divine madness" from which, according to Socrates, "come the best things we have" (Plato, 1997/370 B.C.). Mystical traditions from Christianity to Islam to Hinduism, among others, describe holy or spiritual madness as the source of prophecy and wisdom—communications which are not infrequently mistaken for mere madness and devalued as such, particularly when the messages being conveyed are unwelcome ones.

Madness

It behooves us now to take a step back and examine culture and culturally grounded behavior and decision making. When we are exploring the difference between inspiration and insanity, we must look carefully at the cultural forces that draw that line. For an idea or behavior to be seen as acceptable or even useful, it must speak to the culture (and subcultures) in which it is presented. For the purposes of this discussion, we will use Tylor's classic (1871) definition of culture as: "that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society" (p. 1). Further, we assert that social institutions exist largely to systematize human behavior. Cultural norms are transmitted through social learning that utilizes categorization and symbolic systems.

Difference is often perceived as counter to culture, as something threatening that must be controlled to prevent disturbance to the dominant culture. People who are different are often experienced as threatening to the order and predictability of cultural controls. As a result, the psychological and sociological literatures are rife with research on marginalized groups, the shattering effects of social ostracism, and the extent to which people will go to achieve conformity (Coste & Nemeroff, 2015). Society overall, and cultural groups on a smaller scale, can react brutally to those identified as deviant. In fact, they can even come to be perceived as contagious contaminants.

Given this context, it is not shocking that the stereotype of the *crazy creative* exists. In fact, a number of scientific studies have shown positive correlations between creativity and mental illness, and a variety of biological explanations for the connections between psychopathology and creativity have

been put forth (e.g., Andreasen, 1987; Juda, 1949; Karlsson, 1970). From the most basic lens, the connection makes sense when we consider the deviation creativity requires. And many current theories suggest that creativity results from mild (subclinical) manifestations of the same characteristics that in greater presentations indicate disorders (e.g., Preti & Miotto, 1997). That is, mild manifestations constitute creativity, but greater presentations constitute illness.

However, the determination of abnormality in the sense of mental illness is far from a clear cut exercise, even for experts in mental health. A critical determinant is *maladaptiveness* or *dysfunction;* in other words, the definition of *crazy* depends on the fit between a person and his or her context. Yet the current diagnostic system used throughout much of the world continues to grapple with the basic task of providing a non-subjective definition of this fit. From the DSM-IV to the DSM-V, the definition was changed from:

> a psychological or behavioral pattern generally associated with subjective distress or disability that occurs in an individual and is not part of normal development or culture" (DSM-IV-TR),

which clearly allows for a great deal of subjectivity and disagreement, to a lengthier definition that addresses, with limited success, *how* to distinguish normal from abnormal development or culture fit:

> A mental disorder is a syndrome characterized by clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. Mental disorders are usually associated with significant distress in social, occupational, or other important activities. An expectable or culturally approved response to a common stressor or loss, such as the death of a loved one, is not a mental disorder. Socially deviant behavior (e.g., political, religious, or sexual) and conflicts that are primarily between the individual and society are not mental disorders unless the deviance or conflict results from a dysfunction in the individual, as described above.

Still left undecided is what constitutes *dysfunction*. An alternative approach championed by past-President of the American Psychological Association, Martin Seligman, notes that in everyday life observers tend to use a prototype approach rather than a categorical one in labeling psychopathology. He identifies seven elements of abnormality, of which no single feature is necessary or sufficient to identify pathology, but the more of them we see in a particular person, the more certain we feel that a disorder is present: suffering, maladaptiveness, vivid/unconventional behavior; unpredictability and loss of control; irrationality; observer discomfort; and violation of moral and ideal standards (Rosenhan & Seligman, 1984).

And here is the rub: a creative idea that is too far out of the mainstream will generally be perceived as irrational. It may even cause the observer dis-

comfort. In other words, if the approach or concept being suggested is radically different from the norm, it can be labeled as violating normative standards. Furthermore, individuals generating these ideas may be seen as unpredictable and, if they protest vigorously in defense of their ideas, they may be seen as out of control—the more fervent the defense, the more vivid their behavior. If they continue to be unsuccessful at promoting the creative idea, they are likely to experience suffering, and to the extent that "maladaptive" refers to a mismatch between a person's behavior and his/her environment, the creative individual who cannot successfully sell an idea may, in fact, be described as maladaptive, thereby achieving seven out of seven of the elements of abnormality.

To avoid the determination of being an unacceptable "other," creatives must build a cognitive bridge between their novel ideas and pre-existing ways of thinking. Remember that *crazy idea* and *acceptable idea* are both culturally defined and are deeply rooted in social, political, and religious structures; family, marriage, and gender associations; rituals; artifacts; and shared narratives. It is only with a robust understanding of this web of realities that a creative individual can drive his or her story from the realm of madness to the realm of profitability.

Myth

One effective way to do this is to position the creative as the savior, as the hero of a story, as the leader who can move a situation from the mundane to the glorious. Our deep knowledge of creative leadership is narratological and positions the creative as a hero in a fairy tale or myth-like fashion. Boyce (1996) argues that "myth functions to resolve life's contradictions" (p. 13). In fact, our entire worldview is made up of sets of stories, scripts that must be selected among as we process ideas and actions we encounter (Fisher, 1987). Good or bad reasoning is often embedded in these stories, as we define and redefine ourselves as individuals who possess good sense. Thus, the audience actively participates in the storytelling experience. Its thought processes demand order and gain this structure by interacting with experience so that they become intelligible. The engaging storyteller will weave a myth that allows the audience to tap into known stories and examine how it might use these stories as the basis for good decisions and effective actions.

The larger work on narrative includes research from a number of disciplines: folklorists, anthropologists, communication theorists, sociologists, philosophers, critical theorists, and organizational researchers. This multidisciplinary interest is hardly surprising given the importance of the topic. Throughout history, our core values and most sacred traditions have passed from generation to generation in the form of stories. While objective analysis and hard facts have their place, good storytelling evokes passion and action driven by the heart. And it is this heart-fueled passion that is key to forwarding the creative. Creative survival often involves disruptive change, leading

and inspiring people to act in an unfamiliar (and often uncomfortable) fashion (Denning, 2004). To address this challenge, people are told they must "think out of the box," to abandon any constraints that get in the way of progress. However, this is not really what we are striving for. As Ayers (2002) argues, "when people say *get out of the box* the speakers are really suggesting that you get in their boxes with them" (p. 294). In order for people to move from their box, their worldview, to yours, you must tell a great and compelling story, one that motivates with a sense of purpose and a vision of success.

Over 2000 years ago, Aristotle's *Poetics* (one of the earliest surviving works of dramatic and literary theory) provided us with a formula for good storytelling. He said that stories should have a clear beginning, a well-developed middle that incorporates complex characters engaged in a plot that involves a reversal of fortune, and an end that concludes with a lesson learned. Furthermore, he stated that the narrator should be so engaged with the story that listeners can't help but be drawn into the storyteller's realm (as cited in Denning, 2004). Thus, the effective story will suck its audience in with its potential and contain sufficient evidence of a productive conclusion that they are left satisfied and inspired.

Which brings us back to the hero. Heroes are characters that can have many faces and names. They are often positioned in storytelling as saving the world—saving the company, the community, the country. The premise for this act of saving is the act of creation. Stories in which a hero features prominently bring to life a key player who has done something above the range of normal accomplishment, someone who is up against an impossible challenge over which he/she emerges victorious (Neuhauser, 1994). It is this type of storytelling that creatives must use to sell their ideas, to make their unusual thinking worth jumping out of the box. Boyce (1996) argues that the use of myth and storytelling is not value neutral, that we can use "storytelling to describe and sustain current power structure or to develop new meanings of the collective, the person, and the person within the collective" (p. 11). The extent to which we can sell a tale in which a charismatic leader with strong purpose achieves a unique accomplishment is the extent to which our tale becomes the tale of the collective (Clark, 1972).

As should be becoming clear now, the mythological construction of leaders connects them to the ultimate story of creation. The arch example of this, of course, is the (remarkably swift and efficient) creation of the world in Genesis 1. From this point onward, stories of the world depict a collective of people entering a crisis and standing in need of restoration, sometimes locally and sometimes globally. This has been an elaborated theme throughout the Semitic, Christian, and Muslim belief systems; these stories were told again and again so that everyone learned them and passed them along. In fact, it might be argued that stories are the single most powerful form of human communication, and this has been true for thousands of years worldwide (Solovy, 1999).

In this way, stories have predicted the future by specifying the past. Den-

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ning (2004) argues that the best way to get people to venture along an unknown path is to make that terrain familiar by taking them there in their imaginations first. Stories make that happen by presenting a number of dualities in which the desired state is fairly obvious—security and insecurity, control and lack of control, equality and inequality, heroes and villains, behaviors rewarded and those punished (Kelly, 1985). These narratives present the plots, characters, and action lines that enculturate us all and construct the collective sense that provides for deep connection to what has been presented as what is right and what is good.

Acceptance

There are a number of different lines of inquiry that may help us get at the essence of the collective narrative. A social constructivist perspective holds that our shared meaning is a combination of social reality and symbolic interaction, that the reality we collectively experience has been constructed by our social interactions (Boyce, 1996). A radical humanist perspective emphasizes the psychic prison "in which people are seen as trapped by their unconscious and conscious social constructs" (Boyce, 1996, p. 8). Regardless of the exact tack you take, acceptance finding must necessarily involve presenting yourself and your ideas in a way that is close enough to deep, elemental ways of thinking so that they can be assimilated, rather than being met with indifference or outright hostility.

If your ideas are so discrepant from current collective thinking that they simply cannot assimilated, you will need to build cognitive bridges, stretch the stakeholders' thinking to the point where it can accommodate the new vision. This is where many creatives fail. Most don't know that the burden is on them to promote their ideas. In other words, to the extent that there is a gap between the idea/product and the vision or understanding of the person who needs to approve it, it is the creative's job is to close that gap.

The truly tricky part of this is in the gap finding. There are multiple realities that must be uncovered before one can construct a holistic picture of collective sense making. Neuhauser (1994) suggests asking the following questions to uncover the stories of a community:

Where did we come from?
What is our purpose?
What is taboo?
Who are the enemies?
Who are the heroes?
Who are the guides?
Who has power?
What kind of traumas have people survived?
What tough experiences are people proud to have been through? (p. 31)

The shared meaning, the culture of the collective is the sum total of the an-

swers to these questions (and more).

Beneath these revelations is where the primal, and therefore always-familiar, magical principles can be utilized quite effectively. As Hutson (2008) argues, "magical thought is really about the sacred—objects and symbols and actions distinct from others, by virtue of an essence that taps into unseen forces along the guidelines of human imagination." The earliest definitions of magic describe it as that which crosses the borders of mind and matter, considering cognitive associations as physically present in the external world. Understanding and using the principles of magical thinking can make a creative work resonate in a powerful way so that people respond to it as having a kind of truth. Consider, for example, why J. K. Rowling's *Harry Potter* series has become so wildly popular (Nemeroff, 2007) and why magical principles are used so routinely and successfully in advertising (Argo, Dahl, & Morales, 2008; Fernandez & Lastovicka, 2011; Hutson, 2008). Understanding the patterns of intuitive thinking (the laws of sympathetic magic, the association of ideas to things already known, and the tendency to map the laws of the psyche onto the laws of the real world) can make what is unusual more familiar, more comfortable and compelling.

In conclusion, let us go back to Stein's classic (1953) definition of creativity in which he states that creativity is a "process which results in a novel work that is accepted as tenable or useful or satisfying by a group at some point in time" (p. 311). We must ask, *who is this group*? And *what is this time*? While there are obviously multiple, valid ways of being in the world, people who are labeled *crazy* have received a judgment that they are too different, will not be useful, and will not be successful. In contrast, creators that are recognized as such have connected to the deep knowledge of their observers in a way that recognizes difference but has also achieved a determination of usefulness.

Thus, successful creators rewire the thinking that *crazy ideas* will not be successful. They reiterate and heighten the differentiation between *crazy* and *creative*: crazy is dysfunctional, creative is superfunctional. Thus, creative thinking is not abnormal; it is supernormal. Positioning the acceptability of the creative with sympathetic magic, the creative idea as inspired rather than mad, and the creator as the hero of the story will draw upon collective and celebrated belief systems in a beneficial way.

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CHAPTER SIX

AN EXPLORATORY STUDY OF THE RELATIONSHIP BETWEEN PERSONALITY, COGNITIVE STYLE, AND ARTISTIC CREATIVE PERFORMANCE AMONG CHINESE UNDERGRADUATES IN MACAU

KUAN-CHEN TSAI

ABTRACT The purpose of this study is to examine possible connections between Big Five personality traits, cognitive style, and artistic creativity among Chinese college students. A total of 120 second-year art and design undergraduates were recruited. The major findings indicate that conscientiousness was positively and significantly correlated with creative performance and Kirton's innovator type. Conscientiousness was also the only valid predictor of creative performance, the variance was quite low, which indicates the likelihood of contributions by other factors. In addition, for our Chinese students, cognitive style as measured by the KAI did not affect their artistic creative performance.

Keywords: Big five personality, cognitive style, artistic creativity, Chinese students, art and design

Introduction

Under the banner of individual differences, the personality approach to studying creativity was popular in the research community from the 1950s to the 1970s. Even today, this line of enquiry still enjoys a certain influence in creativity studies (Dollinger, 2007; Merrotsy, 2013). The literature has consistently identified a particular cluster of personality traits as being related to creativity, including independence, introversion, tolerance for ambiguity, willingness to take risks, and open-mindedness (Barron & Harrington, 1981; Batey & Furnham, 2006).

Individual differences in personality have been seen as having five higher-order dimensions, all of which have theoretically and empirically meaningful associations with measures of personality in the different domains (Goldberg et al., 2006). This five-factor framework or "Big Five" model, consisting of Extraversion, Agreeableness, Conscientiousness, Emotional Stability (the opposite pole of Neuroticism), and Intellect (or Openness), has been widely supported by students of personality (Gow, Whiteman, Pattie, & Deary, 2005). Among the five factors, Openness and Conscientiousness have been consistently observed to be salient traits of creative people (Feist, 1998);

and several studies have posited a direct link between personality as measured by the Big Five model and creativity (e.g., Kaufman, 2013; Kelly, 2006). These findings thus lead to the present paper's first hypothesis:

> H1a: The quality of artistic creative performance by an individual will be positively correlated with the personality traits of Openness and Conscientiousness.

> H1b: Openness and Conscientiousness can predict the quality of individual artistic creative performance.

Another important variable, *cognitive style*, has also been examined in the creativity literature (James & Asmus, 2001). One important perspective on cognitive style, especially as it relates to creativity, was proposed by Kirton (1976), whose "A-I" theory divided people dealing with problems into two broad types: adaptors and innovators. For Kirton, adaptors prefer doing things better, while innovators prefer doing things differently; in other words, the former group is more conservative, whereas members of the latter are ready to change and willing to go beyond their comfort zones. A number of empirical studies have compared the creativity of Kirton's two types and found that the innovators performed better (e.g., Bobic, Davis, & Cunningham, 1999; Hsu, 2013; Puccio, Treffinger, & Talbot, 1995; Tierney, Farmer, & Graen, 1999). Based on this strand of prior research, therefore, our second hypothesis is:

> H2a: Innovators' artistic creative performance will be measurably superior to that of adaptors.

> H2b: Cognitive style can predict the quality of individuals' creative performance.

Gelade's (2002) meta-analysis triangulated between A-I theory and the Big Five personality framework, and found that innovators' personalities tended to be characterized by both Conscientiousness and Openness, and to not be marked by either Agreeableness or Neuroticism. Based on these findings, we hypothesize that:

> H3: Kirton's innovator type is positively correlated with Conscientiousness and Openness, and negatively correlated with Agreeableness and Neuroticism.

Attempts to build connections among personality, cognitive style, and creativity have hitherto focused on *divergent thinking* as the key indicator of creative performance. However, at least two major limitations of using divergent thinking as a criterion of creativity should be considered. First, this type of thinking represents only a part of creativity; at best, it can serve as a proxy for verbal creativity. Second, while divergent thinking can reasonably be viewed as an indicator of creative *potential* (Runco & Acar, 2012), it cannot be used in/as a measurement of real-life creative performance. In order to address both of these issues, the current study used authentic drawings to represent artistic creativity in place of artificial tests.

Methods

Participants

Our sample consisted of 120 second-year art and design undergraduates in Macau, China. There were 69 females and 51 males, with an average age of 19 years.

Instruments

Personality Traits. The Big Five Inventory (BFI; Benet-Martinez & John, 1998) was used to examine the participants' personalities for the traits of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. Extraversion refers to activity and energy, sociability, and expressiveness. Agreeableness encompasses traits such as altruism, heartedness, and modesty. Conscientiousness describes the self-control that facilitates task- and goal-directed behavior. Neuroticism indicates anxiety, sadness, and nervous tension. Lastly, Openness relates to the breadth and depth of an individual's life experience. Each of the BFI's 44-items employs one or two prototypical trait adjectives that function as the item core, on to which elaborative and contextual information is added. The participants rated each item on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Benet-Martinez and John (1998) reported that the alpha reliabilities of the BFI scales range from .75 to .90, and that test-retest reliabilities range from .80 to .90. Benet-Martinez and John also provided evidence of the BFI's acceptable convergent and construct validity.

    Cognitive Style. The Kirton Adaption-Innovation Inventory (KAI; Kirton, 1976) was originally developed to test for two cognitive styles: adaptors and innovators. It consists of 32 descriptive items with a 5-point response scale ranging from 1 (*item does not describe me well*) to 5 (*item describes me well*). The possible range of scores is therefore from 32 to 160, and the higher the score, the more innovative the respondent's orientation is. Kirton suggested that a person with an adaptive style will usually score in the 60-90 range, whereas someone with an innovative style will score between 110 and 140. Individuals with scores between 90 and 110 will have some of both characteristics, and under some circumstances can function as bridgers. Kirton reported that the test's reliability was .88 and the test-retest reliability was .82. Bobic, Davis, and Cunningham (1999) have provided evidence of the KAI's construct-, content-, and criterion validity.

    Artistic creativity. We assigned four tasks to the participants, all to be completed on 4K (20.47 x 14.57 inch) drawing papers. For the first task the students were asked to design a poster to promote a hotel in Macau of their choice. In the second, they designed a logo for a consumer product targeted at young adults. The third task was to create two different new typefaces (from a

to z). Lastly, the students used watercolors to create self-portraits. Before they performed each task, our participants watched a PowerPoint presentation providing guidance on how to complete it. In addition, they were encouraged to use their creativity by experimenting with different shapes, styles and/or colors. An individual's index of artistic creativity was obtained from the average of the scores s/he achieved on the four tasks.

Procedure

Questionnaires, which took about 20 minutes to complete, were distributed to participants in the first week of the class. Their participation was voluntary, but they were told that they would receive extra course credit for their contribution. For the tasks of visual creativity, they were parts of Graphic Design class assignments.

Results

The correlations between artistic creative performance and the five personality scales are shown in Table 1. All correlations were low and positive, with the exception of a negative correlation between neuroticism and creative performance. Only one significant relationship was found between conscientiousness and creative performance, $r = .187$, $p < .05$. These findings partially support H1a, which predicted that artistic creative performance would be positively correlated with openness and conscientiousness; but the correlation with openness was not significant.

Table 1 also shows the correlations between the innovator type and the five personality scales, most of which were positive and ranged from low to medium. However, the correlation between neuroticism and the innovator type was significant and negative, $r = -.322$, $p < .05$. The only other significant correlation was between conscientiousness and the innovator type, $r = .45$, $p < .01$. Based on these findings, it can be said that H3 was partially supported: the innovator type was positively related to conscientiousness and openness, though only the relationship with conscientiousness was significant, while there was a negative and significant relationship between innovator and neuroticism. However, the positive nature of the relation we found between the innovator type and agreeableness ran counter to the hypothetical prediction.

Table 1		
Intercorrelations for Creative Performance and Innovator Type on Five Personality Measures		
Measure	Artistic creative performance	Innovator
Extraversion	.045	.024
Agreeableness	.086	.225
Conscientiousness	.187*	.450**
Neuroticism	-.135	-.322*
Openness	.110	.135
* $p < .05$. **$p < .01$.		

When comparing the two groups in terms of their artistic creative performance, innovators ($M = 65.94$, $SD = 4.98$) had higher scores than adaptors ($M = 65.08$, $SD = 7.10$), but this difference was not significant, $t (118) = -.673$, $p = .502$. Therefore, H2a was rejected.

To investigate the extent to which personality type and cognitive style predicted artistic creative performance, we conducted a hierarchical regression analysis. As shown in Table 2, there was little variance between conscientiousness and creative performance ($R^2 = .045$), but it was significant ($p < .05$). The other four personality types and cognitive styles did not show an amount of variance significant enough to predict creative performance. These findings partially support H1b and lead us to reject H2b. In short, the only valid predictor for this model was conscientiousness (b = .233).

Table 2				
Hierarchical Regression Analysis for KAI and Five Personality Measures Predicting Artistic Creative Performance				
Hierarchical step	Predictor variable	b	Total R^2	Incremental R^2
1	KAI	.012	.000	
2	Extraversion	.046	.002	.002
3	Agreeableness	.085	.008	.006
4	Conscientiousness	.233	.045	.036*
5	Neuroticism	-.092	.052	.008
6	Openness	.102	.058	.006
* $p < .05$.				

Discussion

The correlations among five personality traits, cognitive style, and artistic creative performance reveal a general trend favorable to our hypotheses. In particular, conscientiousness was positively and significantly correlated with creative performance and Kirton's innovator type. Another variable – openness – showed a positive but non-significant relationship with creative performance and innovators. In the Big Five structure, conscientiousness is related to impulse control that facilitates task-oriented behavior, while openness describes the breadth and complexity of people's mental life (Benet-Martinez & John, 1998).

Several scholars have argued that divergent and convergent thinking are both important for creativity (Treffinger & Isaksen, 2005; Wong & Siu, 2012). In terms of the former, individuals with more openness in their personality are likely to generate more creative ideas, while with regard to convergent thinking, people characterized by conscientiousness are likely to evaluate and polish their creative works in order to improve their quality.

As expected, the present study found that neuroticism was negatively correlated with artistic creative performance and the innovator type, though only the latter relationship was significant. However, contrary to our expectations, bivariate correlation that the relationship between agreeableness and the innovator type was positive for our sample. Neuroticism describes negative affects, including anxiety, sadness, and nervousness, while agreeableness describes prosocial behavior (Benet-Martinez & John, 1998). In the mood literature, the influences of negative emotions on creative performance are mixed. Baas, De Dreu, and Nijstad's (2011) meta-analysis of mood-creativity relationships, found that sadness was not related to creativity, while anxiety was negatively correlated to it. Our study's finding of a negative correlation

between artistic creative performance and neuroticism is therefore in line with the literature.

Agreeableness, meanwhile, can be expected to have a negative relationship with Kirton's innovator type, since according to the behavioral descriptions of innovators, they prefer doing things differently via reconstructing problems and generating solutions that are un-expected as well as acceptable. Logically, then, innovators are unlikely to be classified as agreeable; and this unexpected result deserves more attention in future research.

Based on independent t testing, the difference in artistic creative performance between adaptors and innovators was not significant. It is probable that our sample of art and design college students used different approaches for their design and drawing production. Innovators might have used more dramatic means of expressing their ideas, and adaptors, in contrast, might have employed more incremental approaches; but the quality of work they attained was similar. Other factors that might have affected the evaluation of students' projects included technical skills, aesthetics, composition, and so on. In sum, for our Chinese students cognitive style as measured by the KAI did not affect their artistic creative performance.

Although conscientiousness was a significant predictor of creative performance, the variance was quite low, which indicates the likelihood of contributions by other factors. Interestingly, in our sample openness and cognitive style did not play predictor roles. These findings contradict those of other studies (e.g., Lin, Hsu, Chen, & Wang, 2012; Zhou & Shalley, 2003). According to Feist's (1998) meta-analysis of personality in science and art, openness, conscientiousness, and self-acceptance had the largest effect sizes. He concluded that creative artists and scientists tended to be more open to experience and less conscientious than others. The current findings partially support Feist's accounts. Where previous studies often used divergent thinking or self-ratings of creative performance as the indices of creativity, the current study used real-life artistic creative performance, which could easily have led to somewhat different results. More research utilizing real-life creative accomplishment is needed to confirm this.

Overall, the current study provides several practical suggestions for educators. First, differences in artistic creative achievement based on differences in cognitive style were not observed; whether our participants were "adaptors" or "innovators", the end-products of their creative endeavors were of similar quality. Importantly, this result reminds teachers to respect individuals' different thinking styles as they complete creative tasks. Conversely, we found that conscientiousness played an important role in creative performance, suggesting that in order to produce high-quality art-works, creativity is not enough; how to integrate different elements while sustaining aesthetic appeal is also important. In other words, in art and design classes, art teachers should put more effort into holistic teaching of creativity, technical skills, and aesthetic.

Limitations

Several limitations should be considered when interpreting the above results. First, the limited ethnic- and age diversity of the participant pool may restrict the generalizability of the results. Moreover, although studies of students' attitudes in educational settings are fairly common, and have been shown to be applicable to non-student practitioners, the one-shot effort employed in the current study should probably be treated as a starting point for longitudinal investigations in the future. Finally, the literature investigating the effects of cognitive styles on visual creativity is not very well-developed at this time, and is ripe for further exploration.

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CHAPTER SEVEN

HOW HAPPY IS A CREATIVE COUNTRY? A COUNTRY-LEVEL ANALYSIS OF CREATIVITY AND SUBJECTIVE WELL-BEING

HANSIKA KAPOOR & ANIRUDH TAGAT

ABSTRACT While psychological literature is familiar with the study of individual creativity, macro-level creative industries and economies have been studied only recently. Indices like the Global Creativity Index (GCI) and the Global Innovation Index (GII) compile information of over 130 economies to provide a snapshot of their creative and innovative behaviour. Given the positive association between creative occupations and subjective well-being (SWB), a study at the national level between these variables can provide valuable insights. Creative inputs, such as a tolerant environment, creative outputs like number of patents filed nationally, and the monetization of creative activities, like the monetary value of creative good exports were used as predictors for SWB. Quantitative regression analyses of secondary data from various agencies, including the World Bank, International Labor Organization, and Gallup Poll, indicated that SWB was significantly explained by specific creativity parameters at the national level. In line with the assumptions that creativity and innovation will be the drivers of future economies and ideas will create economic value, relationships between creativity and SWB can provide meaning and motivation to countries looking to capitalize human resources.

Keywords: creativity; creative economies; subjective well-being; innovation; happiness

How Happy is a Creative Country? A Country-Level Analysis of Creativity and Subjective Well-Being

Creativity is a cognitive process often studied at the individual level as a normally distributed trait (Eysenck, 1993) or as an act manifested by a single entity. This entity could be a creative person, a team of individuals in an organisation, or an entire culture (Batey, 2012). More recently, creativity at the level of economies is gaining academic attention. Creative economies and creative/cultural industries are recently introduced terms to represent parts of the economy contributing output in the form of novel and implementable ide-

as (Boggs, 2009; Ernst & Young, 2015), supplementing more traditional manufacturing and services-related output. Moreover, scientific, artistic, and cultural creative outputs are being identified as contributing value in creative economies (Gibson & Klocker, 2004; Higgs, Cunningham, & Bakhshi, 2008). Against this background, the current chapter analyses the relationships between national-level creativity parameters and subjective well-being (SWB). This analysis is motivated by the potential implications for policy should some parameters effectively predict SWB.

Creativity in Countries and Economies

According to Boggs (2009), over the last few decades economic geographers have shifted attention from manufacturing industries to cultural industries, including but not limited to fashion, media, design, and tourism. Through a combination of four categories, cultural industries in the creative economy can be identified. These include "how a cultural product is made; where it can be consumed; whether innovation is involved in its production; and if it contains symbolic content," (Boggs, 2009, p. 1485). Using narrow or broad typologies for defining creative and cultural economies, industries, and firms can determine the proportion of GDP contributed by such industries (Boggs, 2009; Markusen, Wassall, DeNatale, & Cohen, 2008), thereby implicating policy. A simple description proposed by Bakhshi, Hargreaves, and Mateos-Garcia (2013, p. 34) defines the creative economy as "those economic activities which involve the use of creative talent for commercial purposes." They also suggest that creative occupations are characterised by novelty, resistance to mechanisation, non-repetitiveness, useful contributions, and are interpretive. Using such terminology, research can identify the size of creative and cultural industries, their contribution to the GDP, the proportion of labour involved in such industries as well as the incomes of those employed in such industries.

An analysis of the global representation of creative and cultural industries by Ernst and Young (2015) indicated that such industries generated USD 2,250 billion in revenue and employed 1% of the world's population by generating 29.5 million jobs worldwide. These industries were analysed in 11 sectors (advertising, architecture, books, gaming, music, movies, newspapers and magazines, performing arts, radio, TV, and visual arts) across 5 global regions (North America, Europe, Latin America and Caribbean, Africa and Middle East, and Asia-Pacific). It was found that the Asia-Pacific region contributed the most revenue to these industries as well as generated the most jobs. Other policy documents have focused on UK and European creative economies, offering suggestions for leveraging existing creative talent as well as promoting sustainable creativity across domains. In addition to providing estimates of the workforce engaged in the creative economy in the UK, Higgs, Cunningham, and Bakhshi (2008) also estimated incomes generated from engaging in creative occupations. Their findings suggested that over 7%

of UK employment was accounted for by the creative economy and that creative incomes were 27% higher than the average in the UK economy in 2006. Similarly, Bakhshi et al. (2013) proposed comprehensive definitions of creative industries and the creative economy to facilitate inclusion of relevant sectors to yield reliable estimates of employment and revenue generation. They also proposed methods to encourage creative businesses and develop a holistic integration of creativity training in the educational curriculum. With respect to Europe's cultural and creative industries, regions with the highest concentration of such industries had the highest levels of prosperity (Power & Nielsén, 2010). The criteria for categorizing an activity under a creative industry, however, are fluid, and there is no consensus in the literature on a set of creative industries. In addition to identifying industries, firms, and occupations to include while assessing creative economies (Markusen et al., 2008), the selection of creative parameters is also important for examining relationships with other variables, like SWB.

Creativity Measurement and Indices

To evaluate such relationships between creativity/innovation parameters and metrics of economic and human development at the national level, composite indices have been developed. The Global Creativity Index (Florida, Mellander, & King, 2015; Florida, Mellander, & Stolarick, 2011) was first introduced in 2004 to provide a composite assessment of national creativity as assessed through its components. Based on the book *The Rise of the Creative Class* (Florida, 2002)*,* it was proposed that the global economy was undergoing a transformation because of the emerging 'creative class.' This group comprised individuals like scientists, artists, researchers, writers, and other creative professionals who would usher the creative age. The book also presented the '3 Ts' of economic development – Talent, Technology, and Tolerance. Florida (2002) suggested that any location should have these components in order to attract creative individuals and promote economic growth. In the 2015 edition of the Global Creativity Index (GCI; Florida et al., 2015), data on the 3 Ts was provided for 139 nations to enable the assessment of creativity and prosperity. Talent consisted of the global creative class including "workers in science and technology and engineering; arts, culture, entertainment, and the media; business and management; and education, healthcare, and law" (Florida et al., 2015, p. 14). Global educational attainment as assessed by the tertiary enrolment ratio was also included within talent. The technology sub-index consisted of investment in research and development, and innovation as represented by the number of patent applications per million people. Within tolerance were included the extent to which nations were tolerant toward racial and ethnic minorities, and gay and lesbian people. It was argued that locations amenable to more diverse populations were likely to attract the creative class as well as spur economic growth. Independent

analyses for talent, technology, and tolerance identified Australia, South Korea, and Canada as global leaders respectively (Florida et al., 2015).

Subsequently, the Hong Kong Creativity Index (HKCI; Hui et al., 2006) was also developed to estimate the extent of creativity at the national level. This index identified and addressed the limitations of the GCI, proposing that four types of capital (structural/institutional, human, social, and cultural) yield creative outcomes. Further, the HKCI was based on interdependence and a dynamic nature of relationships between creativity and the local context, enabling a more holistic assessment through 88 creativity indicators. However, data was compiled and presented only for Hong Kong to elucidate macro-level factors that facilitate or impede the expression of creativity. Indices such as the GCI are developed for broad comparisons across nations, to enable ranking nations in terms of creative productivity as well as to guide policy. Correia and Costa (2014) compared 12 such indices and suggested that a singular creativity index is yet to be accepted and utilised across the world. It was also concluded that altering dimensions within an index can lead to differential rankings, possibly making indices susceptible to confirmation bias.

In a similar vein, the Global Innovation Index (GII; www.globalinnovationindex.org) ranks economies on the basis of the inputs and outputs of innovation behaviour since 2007. The GII framework includes the innovation input sub-index (institutions, human capital and research, infrastructure, market sophistication, business sophistication) and the innovation output sub-index (knowledge and technology outputs, creative outputs). The GII differs from creativity indices with respect to its emphasis on the implementation of creativity and its valuation. For instance, Information and Communication Technology use is not directly related to creativity, but the proportion of trade comprising of creative goods and services exports is relevant. The parameters included in indices such as the GCI, GII, and HKCI enable the study of relationships with other composites, such as indicators of economic and human development. In contemporary development studies, there is increasingly a shift away from relying on quantitative measures of economic well-being (such as the Per Capita Gross Domestic Product, or GDP) toward broader measures, such as subjective well-being and/or happiness (Philipsen, 2015). This is largely on account of the shortfalls of relying on a quantitative measure of development, that does not reflect changes in other aspects of human development (partly which necessitated measures such as the Human Development Index, or HDI). More recently, the Stiglitz Commission (Stiglitz, Sen, & Fitoussi, 2009) recommended the use of subjective measures of quality-of-life to supplement existing objective measures such as per capita GDP, indicating the importance of measures such as subjective well-being in determining the social and economic progress of a society.

Creativity and Subjective Well-Being: Macro Perspectives

As an indicator of human development, subjective well-being assesses the overall quality of life (Diener, Napa Scollon, & Lucas, 2003). Past work has examined the reliability and validity of the construct (Krueger & Schkade, 2008; OECD, 2013); provided definitions of SWB, distinguishing it from related concepts like happiness and life satisfaction (Diener et al., 2003; OECD, 2013); and provided information of SWB's influence on welfare and the formulation of public policies (Kahneman & Krueger, 2006; Oishi & Diener, 2014). Positive and negative affective measures, like happiness and distress; life satisfaction assessments, like the Cantril Ladder or global cognitive judgments of life satisfaction; and domain-specific satisfaction measures, like satisfaction with marriage or work are often used to examine SWB (Diener et al., 2003; OECD, 2013). In this context, the Global Well-Being Index is a comprehensive assessment of well-being, which can be considered as evaluating well-being in five domains: purpose, social, financial, community, and physical well-being (Gallup Healthways Well-Being Index, 2014). The 10 items assessing these domains yield three levels of well-being: thriving, struggling, and suffering. Such metrics provide national data for SWB, which can be associated with relevant variables to assess their interaction with development and public policy, where applicable.

The relationship between creativity and SWB can be proposed via innovation and economic prosperity. At the national level, innovation and innovative behaviour of creative industries are often examined in the context of their association with economic growth (Grossman & Helpman, 1991). Higher economic growth is associated with increases in SWB, at least in the short run (Easterlin, 2013; Sacks, Stevenson, & Wolfers, 2010). It is important to note, however, that very few studies have made causal links since the direction of causality remains ambiguous (Stevenson & Wolfers, 2008). Emerging studies (e.g., Diener & Tay, 2015) have also attempted to link the more holistic idea of economic development (e.g. environmental health, social support, and life satisfaction) with changes in SWB. Given this rationale for an association between innovation and SWB, potentially one mediated by economic growth, NESTA (National Endowment for Science, Technology, and the Arts) regularly conducts research on the investment in innovation in the UK as well as its correlates to parameters like well-being (Dolan, Metcalfe, Powdthavee, Beale, & Pritchard, 2008; Miller, Marks, & Michaelson, 2008). Such research provides insight into the elements of innovation, creativity, and SWB at the national level. In general, findings suggest positive links between innovation and SWB, although the direction of causality remains to be determined. Miller, Marks, and Michaelson (2008) suggest that well-being could be both an input and an outcome of innovation, emphasizing the bi-directional relationship between the variables.

The focus of the current chapter is on the relationship between creativity and SWB, rather than innovation and SWB. The reasons for this are

multi-fold. First, creativity is a prerequisite for innovative behaviour (Amabile, Conti, Coon, Lazenby, & Herron, 1996), thereby suggesting that innovations are *implemented creativity*. Second, innovation is typically referred to in the context of organizations, technological advances, and effects on the bottom-line or profitability. Creativity is represented in wider, more multi-faceted contexts, inclusive of artistic, scientific, and cultural domains. Third, past research on creativity and moods has identified a relationship between positive mood states (such as happiness) and increases in creative thought (Baas, De Dreu, & Nijstad, 2008; Gasper, 2004). Similar research on innovation and mood has relied on examining links with creative thought processes to arrive at conclusions (e.g., Kaufmann, 2003). The aforementioned mood-creativity research considers moods to be an input to creativity, that is, positive moods come before creative thinking (see also Miller et al., 2008). To enable the inclusion of parameters not restricted to applied ideas, the relationship of creativity and SWB was assessed.

With respect to national-level data, few studies have examined the association between creativity parameters and SWB. In contrast, the prediction of SWB from other country-level variables is often under empirical investigation. In a comprehensive review, Dolan, Peasgood, and White (2008, p. 94) found that "poor health, separation, unemployment and lack of social contact are all strongly negatively associated with SWB." However, the authors also indicated the difficulties associated with establishing causality in such relationships. In line with such research, the current chapter proposes to examine the creativity-SWB relationship by predicting SWB using creative variables. While it is true that the direction of causality remains to be empirically investigated, this chapter proposes that SWB is an outcome of creative variables at the national level. Recent work in this area has similarly predicted SWB as explained by a combination of creativity parameters (Dolan, Metcalfe, et al., 2008; Esnerova, 2013; Forgeard, 2015; Fujiwara, Dolan, & Lawton, 2015). The rationale of employing SWB as the predicted variable lies in the observation that researchers are interested in identifying the correlates of SWB (what makes people happy/unhappy) rather than identifying the status quo (how happy people are). Moreover, SWB is not a policy variable, in that directives cannot reliably be issued requiring people to be happier. Instead, efforts are made by policymakers to maximise SWB through appropriate policies (Oishi & Diener, 2014). Therefore, SWB is predicted from variables, such as creativity, to locate its determinants and influence policy.

With respect to macro-level creativity and SWB, Florida, Mellander, and Stolarick (2011) examined the association of the GCI with multiple variables: economic output, global competitiveness, entrepreneurship, economic inequality, human development, and happiness. In this study, happiness or SWB data was obtained from the Gallup World Poll, where a single item (the Cantril Ladder) was used to assess life satisfaction. Positive associations between SWB, and the GCI and its components were found, with the strongest relationship within developed nations, such as Sweden, Denmark, and Fin-

land. However, Florida et al.'s (2011) report did not include predictions of SWB or any other economic variables from the GCI, thereby limiting the exploration of the relationships. Esnerova (2013) provided a critique of this approach and re-examined the SWB-GCI relationship employing regressions. GCI predicted life satisfaction (SWB) in a non-linear manner, indicating that incremental increase in creativity does not correspond to the same increase in SWB across nations. Further, differential associations between SWB and GCI components of Tolerance were noted, suggesting that assessment of creativity indices, rather than independent creativity parameters, may lead to spurious relationships. Later, Florida, Mellander, and King (2015) reported an analysis with an updated GCI, examining its relationships with economic output, global competitiveness, global entrepreneurship, human development, urbanization, and economic inequality; SWB was excluded from this analysis.

Fujiwara, Dolan, and Lawton (2015) examined whether creative occupations, such as journalists, artists, authors, were associated with higher SWB (measured by happiness, worthwhileness, and life satisfaction) in a UK sample. Although individuals in some creative occupations were measurably happier, they were also more anxious in comparison to the average. Similarly, at an individual level Forgeard (2015) assessed the individuals for whom creative behaviour predicted increases in well-being. Recruiting a sample of artists and scientists, the findings suggested that individual differences play a vital role in this relationship. The assessment of creativity and well-being is in its nascency, providing an opportunity to explore new relationships within this domain. A study at the national level between these variables can provide insights into the creative components of happiness across countries. Creative inputs, such as a tolerant environment (GCI), creative outputs like number of patents filed nationally (GII), and the monetization of creative activities, like the monetary value of creative good exports (GII) can be used as predictors for subjective well-being at the national level.

The Present Study

This study did not make use of any predefined creativity or innovation indices in their entirety. This is because existing indices are either too brief (GCI), elaborate on constructs other than creativity (GII), or are specific to a single country (HKCI). For a detailed critique of the GCI, see Esnerova (2013). Instead, the current research employed a three-pronged classification of creativity-related activities at the national level: inputs, outputs, and monetization. This was motivated by literature and theory in three ways. First, earlier work in organizational and group processes literature has proposed a broad input-process-output model generating creative and innovative output (Curral, Forrester, Dawson, & West, 2001; Hackman & Morris, 1975; West & Anderson, 1996). For instance, in a study by Mathisen, Martinsen, and Einarsen (2008), team member's creative personalities (inputs) were associated with overall team innovation (outputs), as mediated by the innovative climate of the team

(process). Applying this model to nations, it was assumed that to generate creative outputs, creative inputs at the national level are required, like higher education enrolment and a larger share of the population being employed in creative occupations. Second, from the point of view of Rhodes' (1961) four Ps model of creativity, inputs (person, press), as mediated by the process of creativity, yield outputs (products) and represent the broader facets of creativity. Third, we use the GII classification of sub-indices on the basis of inputs and outputs of innovation, extending their model to our study of creativity. Further, the rationale underlying the tripartite classification of creative components in terms of national level variables was to identify the differential relationships between SWB and the stages of creative production. Here, creative outputs are a penultimate outcome, given the recent discussion of creative economies and industries. Therefore, monetization of creativity was also included as a composite in the analysis. By including three composites predicting SWB, the analyses implied potential action points for private and public policy. For instance, if creative inputs significantly predict SWB, more than outputs or monetization, then an argument can be made for countries to increase focus and expenditure on research and development or implement policies aimed at increasing tolerance of different cultures and communities to foster greater national well-being. Furthermore, if increases in creative outputs (such as a growth in printing or publication of books, or an increase in feature films produced) explain increases in SWB, a case can be made for greater private action in boosting these creative industries.

In sum, the current research was undertaken to make a case for the prediction of SWB from creativity parameters at the national level, while taking into account socio-demographic variables. Specifically, the broad research question pertained to the description of quantitative relationships between creativity (as represented by inputs, outputs, and monetization) with SWB across nations.

Method

Datasets for Creativity Parameters, SWB, and Controls

Secondary data was compiled for identified parameters of creativity, SWB, and control variables. Table 1 displays the variables, primary and secondary sources of data, year(s) from which data was obtained, and the number of countries for which data was obtained. In cases where a nation's data was not available for a particular year, the previous year's data point was used across variables to minimise missing data. SWB was operationalized through the Global Well-Being Index as assessed by the Gallup Polls (Gallup Healthways Well-Being Index, 2014). Specifically, the percentage of the population sampled thriving in at least three elements of well-being was taken as an estimate of SWB. Control variables were sourced from World Bank and International Labour Organisation data. Creativity data was first sourced from GCI and GII

indices and then from alternate sources as required. We first compiled data for all countries studied in these sources, and then merged them to create a common dataset that contained overlapping data for a subset of about 50 countries. Where data for 2014 was unavailable from these sources, the most recent data available (not prior to 2010) for a particular variable was sourced. On average, data for about 121 countries representing all regions was available across variables.

Creativity Parameters: Tangible Inputs, Outputs, and Monetization

While creativity indices were excluded from the analysis, their parameters were classified on the basis of their representation in the stages of creative production. We began with the GCI, GII, and HKCI indices to identify suitable parameters within the input-output-monetization model. Creativity parameters were selected on the basis of four considerations:

(a) After assessing the operational definition of each variable in the index, a categorization was made regarding its inclusion as an input, output, or monetization variable. Here, the emphasis was on including parameters related to creativity and not innovation.

(b) Each creative parameter and sub-index was evaluated on the basis of its initial placement in the stages of creative production. For instance, it was assumed that being in an occupation which has a scope for behaving creatively precedes creative output. In order to write research papers, representing engagement in scientific creativity, there need to be an existing mass of researchers in the country. Therefore, creative occupations were classified as an input to creativity, as without initial creative occupations, there would neither be a surge in future occupations in the domain nor an increase in future creative output.

(c) Each parameter was evaluated on the basis of recency and completeness of data sources cited and available. As the HKCI contained data for Hong Kong alone, attempts were made to source HKCI parameters from alternate sources. For instance, household and government cultural expenditure was obtained from the OECD.

(d) Where identical parameters from different indices were available, the original data source was identified to ensure that the same data is not counted twice. For instance, both the GCI and GII include expenditure on research and development (R&D) activities, but only

the World Bank Development Indicators was utilised to source this data.

Five out of the six parameters in the GCI represented creative inputs: the Global Tolerance Index (global tolerance toward ethnic and racial minorities, and toward gay and lesbian people), Global Talent Index (global creative class and the global educational attainment), and global investment in R&D. Other inputs were household and national level cultural expenditure, proportion of venture capital per GDP, and the proportion of micro, small, and medium enterprises (MSMEs) as compared to the total number of establishments. The first two indicators capture macro and micro-level expenditures on cultural activities such as books, music, and art. Both, the proportion of venture capital per GDP as well as the proportion of MSMEs to total establishments are suggestive of the environment in which entrepreneurship is enabled. A larger share of MSMEs in an economy may also serve as a proxy variable for creative employment, if not captured elsewhere.

Global innovation (GCI), as defined by patent applications, was comprehensively included in the GII and was classified as outputs of creativity. Other intellectual property outputs like trademark applications were also included. Among scientific creativity outputs, numbers of scientific articles published and citable documents were included as outputs. Other outputs were the numbers of new businesses established and cultural creative outputs included the global media and entertainment output, printing and publishing output, feature films produced, and music-related output. Creative parameters for monetization included royalty and license fee receipts, cultural and creative service exports, cultural good exports, and the economic contribution of creativity. Almost all parameters for outputs and monetization were obtained from the GII, after eliminating the variables associated with innovation rather than creativity. It must be noted that the creativity parameters identified here are not all-inclusive input, output, or monetization variables. The objective of this chapter was to develop an initial taxonomy based on this tripartite model, amenable to iterations based on future data and creativity parameters given the evolving nature of creativity.

Hierarchical linear regression analysis was used to determine whether the creativity parameters predicted SWB. We use ordinary least squares (OLS) estimation to explain the causal effect of various parameters of creativity on subjective well-being. We specify three econometric models that are estimated:

$$SW_i = \alpha + \beta\, C_i^j + \gamma X_i + \varepsilon_i \text{, where } j = \{I, O, M\} \tag{1}$$

Where, SW_i repres SW_i ents the percentage thriving for the ith country in at least three components and can take a value from 0 to 100; C_i^j is a v C_i^j ec-

tor of creativity measures for the jth parameter (j varies according to inputs (I), outp ^{I} uts (O), and ^{O} monetization (M)) in t ^{M} he ith country; X_i is the X_i set of country-level socio-demographic control variables; and ε_i is the ε_i error term. For Equation 1, we estimate two models: one with just the creativity parameters and another with the creativity parameters along with socio-demographic control variables. As data for the same countries was not available across variables, a minimum of 43 countries with data on the same variables was determined as the sample size for the regressions to draw meaningful conclusions. Owing to such considerations, only a subset of the identified parameters was included in the regressions. In cases where the parameter was not included in the regression, correlations with SWB were computed to identify the nature of association.

Results

With respect to creativity inputs (Table 2), the global creative class ($B = .127$, $p < .05$) positively predicted SWB in Step 1. Tolerance toward gay and lesbian people ($B = -.181$, $p < .01$) and MSMEs per 1000 people ($B = -.135$, $p < .05$) negatively predicted SWB in Step 1. In Step 2, Tolerance toward gay and lesbian people ($B = -.141$, $p < .01$), MSMEs per 1000 people ($B = -.114$, $p < .05$), and unemployment ($B = -.734$, $p < .01$) negatively predicted SWB, indicating robust effects for the creativity parameters. Income inequality (measured by the share of income held by the top 10%; $B = .731$, $p < .05$) positively predicted SWB. With respect to creativity outputs (Table 3), domestic resident patent applications ($B = -.20$, $p < .01$) negatively predicted SWB, whereas citable documents ($B = .016$, $p < .01$), national feature films ($B = .345$, $p < .05$), and printing and publishing ($B = 116.9$, $p < .10$) positively predicted SWB. After including controls in Step 2, none of the creativity parameters significantly predicted SWB; unemployment ($B = -.776$, $p < .01$) negatively predicted SWB, whereas income inequality ($B = .589$, $p < .05$) and GDP growth ($B = .292$, $p < .10$) positively predicted SWB. For monetization variables (Table 4), receipts of royalty and licensing fees ($B = 2.206$, $p < .01$) and cultural and creative services exports ($B = 2.151$, $p < .10$) positively predicted SWB in Step 1. Again, after the inclusion of controls, the creativity parameters turned non-significant. In Step 2, unemployment ($B = -.499$, $p < .01$) negatively predicted SWB, while income inequality ($B = .498$, $p < .10$), urban population ($B = .230$, $p < .01$), and GDP growth ($B = .453$, $p < .01$) positively predicted SWB.

Table 5 presents correlations of SWB with input and output parameters not included in the regression analyses due to small sample sizes or data available for different countries. Amongst inputs, number of researchers per million ($r = .23$, $p = .02$) and venture capital deals ($r = .38$, $p = .02$) were

directly related to SWB. Amongst creative outputs, national office resident utility model applications ($r = -.23$, $p = .08$) was negatively related to SWB, whereas patent cooperation treaty resident applications ($r = .31$, $p = .001$) and global entertainment and media output ($r = .40$, $p = .003$) were positively related to SWB.

Discussion

The current study examined the associations between SWB and creativity parameters at different stages of the creative process: inputs, outputs, and monetization. Instead of using creativity indices as predictors, we examined creative components permitting the inclusion of different and non-overlapping variables to determine SWB. Through predictive analyses, it was found that creative occupations, citable documents, number of feature films produced, printing and publishing, royalty fees from licenses, and cultural and creative services exports were associated with higher SWB. On the other hand, tolerance toward gay and lesbian people, MSMEs, and patent applications predicted decreases in SWB. Correlational analyses were also computed and were indicative of linear patterns between creativity and SWB.

Five out of the 11 creative inputs were associated with SWB. In line with Florida (2002) and Fujiwara et al. (2015), the creative class as represented by people engaged in creative occupations significantly predicted SWB. Such an association at the national level indicates the importance of generating such occupations in the economy as well as introducing an element of creativity in less creative jobs to increase levels of well-being. This was also corroborated by the positive association between SWB and the number of researchers in the nation, indicative of the importance of the scientific creative class. Although we were unable to obtain a statistically significant effect, R&D expenditures were positively associated with SWB, consistent with results from Sharpe and Smith (2005). Past studies have also indicated that researchers themselves often have a high level of job satisfaction (Dolan & Metcalfe, 2012). Interestingly, the components of the tolerance sub-index of the GCI were differentially related to SWB, similar to differences found by Esnerova (2013), providing additional reason to study creativity parameters independently and not within indices. Tolerance toward gay and lesbian people negatively predicted SWB, indicating that such tolerance does not lead to a higher level of SWB at the national level. Data on tolerance was obtained from the Gallup World question "Is your city or area a good or bad place to be in for gay and lesbian people?" It is possible that respondents provided socially desirable responses, implying that such tolerance may be conditional in nature; that is, persons may report tolerance toward this community, but may not be satisfied or happy with their inclusion. Contrary to common knowledge, the number of MSMEs negatively predicted SWB. Past research has found that although MSMEs can contribute positively to the economy, in the absence of institutional and governmental supports, such enterprises may

not effectively contribute to economic growth (Beck, Demirguc-Kunt, & Levine, 2005) and thereby to SWB. Venture capital deals and SWB were positively correlated, suggesting that a higher level of SWB was likely to be accompanied by a greater infusion of venture capital in an economy. A higher incidence of venture capital in an economy has been known to facilitate entrepreneurship, thereby increasing the diversity of creative activities and overall happiness (Audretsch & Belitski, 2015).

Seven out of 12 creative outputs were associated with SWB. The relationship of scientific creativity with SWB was illustrated through the prediction of SWB from numbers of citable documents. The H-index indicates not only that scientific creativity is being engaged in, but also that such novel work is being recognized as such and cited by other researchers across the world. Further, the association of scientific creativity and SWB via intellectual and prosocial motivations has been elaborated by Forgeard's (2015) work and academic publishing as a creative activity is elaborated in Gibson and Klocker's (2004) paper. Within artistic creative outputs, feature films, global entertainment and media, and printing and publishing were directly associated with SWB. According to Hui et al. (2006, p. 33), artistic and cultural creative output "could produce intangible value equivalent to that of 'public goods,' embodying knowledge, inspirations, aesthetics and symbolic meaning beneficial to the social and cultural development of creative minds and abilities." Further, the association between leisure with SWB is supported by past research. Reviews by Adams, Leibbrandt, and Moon (2011) and Newman, Tay, and Diener (2014) have summarized positive associations of participating in leisure activities, such as watching movies and reading, with SWB. Entertainment and media output represent not only creative outcomes, but also the creative class that is linked with the production of such output.

However, the relationship between SWB and patent applications was less consistent. Of the three patent/trademark variables significantly associated with SWB, only one was positively related. Part of this variation in effects may be on account of different countries entering the sample – for example, the positive correlation between Patent Cooperation Treaty resident applications and SWB had nearly double the number of observations than the other two variables representing patent applications. Research by Derclaye (2014) has similarly found that there is no association between trademarks and SWB and the association between patents and SWB exists up to a peak. Thereafter, there is no discernible relationship between patents and SWB, levelling off or declining past a certain point. Thus, although patents may represent the epitome of creative thinking and innovative behaviour, their relationship to SWB needs to be studied further.

Two out of the three monetization variables positively predicted SWB, without controlling for social and demographic characteristics. Receipts of royalty and licensing fees included the licensing of proprietary rights and original material, such as patents, copyrights, films, and manuscripts (Dutta, Lanvin, & Wunsch-Vincent, 2014). This generated greater income for the

existing base of intellectual property in a country and thereby was associated with SWB. These artistic and cultural outputs were also associated with SWB thereby emphasizing their consistent positive relationship with SWB. Exports of creative services, as opposed to that of creative goods were related to SWB; such services included personal, cultural, and recreational services (Dutta et al., 2014). This may be due to the following: First, services are likely to be more easily exported as compared to creative goods given that they are intangible; second, exports of creative services ($M = 0.3\%$ of GDP) were of lower worth than that of creative goods ($M = 1.48\%$ of GDP) implying a robust association with SWB; and last, perhaps experiences rendered by creative services were more related with SWB as compared to ownership of creative goods. Given that the monetization parameters were highly associated with income (or in some cases measured as a fraction of total GDP), these findings were in line with overall increases in income stemming from creative industries leading to higher SWB. Indeed, when we control for GDP per capita, a variable that is likely correlated with monetization parameters, we no longer find statistically significant effects of these variables. An integration between artistic, cultural, scientific creative classes, outcomes, and monetization parameters was therefore associated with SWB.

Limitations and Future Research

Although this chapter assessed the relationships between SWB and creativity parameters across nations in a novel framework, some limitations are to be acknowledged. Despite the bi-directional nature of SWB and creativity, this chapter examined only one direction; therefore, it is pertinent that future studies in the domain explore how SWB can predict creative production as well. Second, attempts were made to collect the most recent data on all indicators for as many countries as possible; however, the final analyses were constrained by the availability of data across time periods, countries, and parameters. Third, apart from the creative indicators included in the models, there may be other variables that can serve as proxies for creative ideation and production. Therefore, subsequent work can use the input-output-monetization framework and include newer and possibly more relevant indicators. For instance, intangible creative inputs, such as scarcity and adversity (e.g., Mehta & Zhu, 2008), can be qualitatively analysed to assess their relationships with SWB. Moreover, future research can assess heterogeneous effects like how creativity parameters explain SWB across different geographical regions, across industries within such regions, and within different institutional frameworks across nations.

With respect to impact, the current research has the potential to contribute to the traditional four Ps framework of creativity, where the construct consists of Person, Process, Product, and Press variables (Rhodes, 1961). Although some of the current inputs and outputs can be classified within this framework, the present study contributed a fifth P to the model: Profit.

Whereas profit and monetary incentives for creativity are usually associated with tangible outputs, also called innovations, this study suggested that creative endeavours and ideas can also be assigned a monetary value and contribute to the economy (Colvin, 2006). Further, the study identifies broad stages of creative production at the national level, delineating inputs, outputs, and monetization. Assessing creativity in this manner can help formulate theories regarding region-level discrepancies in effects on SWB, which can be mitigated through targeted interventions. Applications to the construct of SWB will also accrue; for instance, appending creativity and creative acts as predictors of national well-being can contribute to future theories of the constituents of happiness.

With respect to academic implications of the current work, this was, to the knowledge of the authors, an initial rigorous empirical assessment at the national level of two constructs that are intuitively related to each other: creativity and subjective well-being. By conducting the present study through a model of inputs, outputs, and monetization, the model allowed for the inclusion of emerging creative variables that may soon be documented (for instance, the number of original memes produced per million persons in a country). By not using an index, the current research afforded the creative predictors some flexibility to be added and subtracted based on cultural changes and varying norms. The model in itself was designed to be iterative, and this was an initial test of its association with SWB, which can be refined through future work.

By establishing a robust relationship between SWB and creativity, the emphasis of countries on creative variables of significance can be addressed in the future. For instance, policy implications and suggestions can be derived from the findings that the global entertainment and media output of countries predict subjective well-being. Here, countries can guide their interventions toward increasing employment and education in entertainment and related fields. Second, a broad relationship between creativity and happiness can practically impact the relative emphasis given to consumption versus production activities. For instance, the Startup India program launched by the Government of India emphasizes creativity and innovation through productive activities, with a high potential of employment generation (www.startupindia.gov.in). Such a national level analysis has the potential to suggest that adding an element of creativity in daily life or in occupations that are not amenable to creative production may have implications for subjective well-being at the individual level.

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Table 1

Data Sources for SWB and Creativity Parameters

Sr No	Variable	Source	Source (Secondary)	Year(s)	N
	Subjective Well-Being				
1	Percent Thriving	Gallup Polls		2014	126
	Inputs				
1	Global creative class	GCI	International Labor Organization	2010-2012	93
2	Global educational attainment	GCI	World Bank World Development Indicators	2010-2012	120
3	R & D Expenditure (% of GDP)	World Bank World Development Indicators	Various	2013-2014	89
4	Tolerance toward Ethnic and Racial Minorities	GCI	Gallup World Poll	2014	121
5	Tolerance toward Gay and Lesbian people	GCI	Gallup World Poll	2012	118
6	MSMEs per 1,000 people	Varied	International Finance Corporation	1993-2010	132
7	Number of researchers per million	GII	UNESCO	2011	119
8	Private (household) cultural expenditure	OECD	-	2014	41
9	Government spending on culture and recreation	OECD	-	2014	28
10	Venture capital per GDP	GII	Thomson Reuters, Thomson One Banker Private Equity database; International Monetary Fund World Economic Outlook 2013 database, April 2013 (PPP$ GDP) (2006–12).	2013	71
11	MSMEs employment share in the economy (%)	Varied	International Finance Corporation	1993-2010	132
	Outputs				
1	New businesses/th pop. 15–64	GII	World Bank, Doing Business 2014, Entrepreneurship (2007–12)	2012	102
2	Scientific & technical articles/bn PPP$ GDP	GII	Thomson Reuters, IMF	2013	142
3	Domestic resident patent app./tr PPP$ GDP	GII	World Intellectual Property Organization, IMF	2012	110
4	Citable documents H index	GII	SciMago Country Ranking	1996-2013	143
5	Domestic resident trademark app./bn PPP$ GDP	GII	World Intellectual Property Organization, IMF	2012	102
6	National feature films/mn pop. 15–69	GII	UNESCO	2011	103
7	Printing & publishing manufactures, %	GII	UNIDO	2010	93
8	Patent Cooperation Treaty resident applications	GII	World Intellectual Property Organization, IMF	2012	114
9	National office resident utility model applications	GII	World Intellectual Property Organization, IMF	2012	60
10	Madrid System trademark applications by country of origin	GII	World Intellectual Property Organization, IMF	2012	75
11	Global entertainment and media output	GII	Price, Waterhouse, Cooper's Global entertainment and media outlook, UN	2012	59
12	Music titles, lyrics, performances (other outcomes of creative activity)	HKCI	-	-	-
	Monetization				
1	Royalty and license fees, receipts (% of total trade)	GII	WTO, IMF	2012	114
2	Cultural and creative services exports (% of total trade)	GII	WTO, IMF	2012	105
3	Creative goods exports (% of total trade)	GII	UNESCO, WTO, IMF	2012	126
4	Economic contribution of creativity	HKCI	-	-	-
	Controls				
1	Urban population (% of total)	World Bank World Development Indicators		2014	239
2	Age dependency ratio (% of working-age population)	World Bank World Development Indicators		2014	239
3	Unemployment, total (% of total labor force) (national estimate)	International Labor Organization		2014	155
4	GDP per capita growth (annual %)	World Bank National Accounts Data		2014	227
5	Income share held by highest 10%	World Bank World Development Indicators		2010-2014	125

Note. GCI = Global Creativity Index; GII = Global Innovation Index; UNESCO = United Nations Educational, Scientific and Cultural Organization; OECD = Organisation for Economic Co-operation and Development; IMF = International Monetary Fund; UNIDO = United Nations Industrial Development Organization; HKCI = Hong Kong Creativity Index; WTO = World Trade Organisation.

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Table 2

Multiple Regression Analysis (OLS) of Creative Inputs as Predictors of SWB

Note. Robust standard errors in parentheses

VARIABLES	(1) Percent Thriving	(2) Percent Thriving
Global creative class	0.127**	0.0271
	(0.0576)	(0.0697)
Global educational attainment	0.0684	0.0146
	(0.0574)	(0.0459)
R & D Expenditure (% of GDP)	0.183	0.0409
	(1.774)	(1.763)
Tolerance toward Ethnic and Racial Minorities	-0.0571	-0.0508
	(0.0431)	(0.0346)
Tolerance toward Gay and Lesbian people	-0.181***	-0.141***
	(0.0451)	(0.0371)
MSMEs per 1,000 people	-0.135**	-0.114**
	(0.0586)	(0.0453)
Urban population (% of total)		-0.0169
		(0.133)
Age dependency ratio (% of working-age population)		0.236
		(0.244)
Unemployment, total (% of total labor force) (national estimate)		-0.734***
		(0.202)
GDP per capita growth (annual %)		0.316
		(0.313)
Income share held by highest 10%		0.731**
		(0.276)
Constant	32.23***	11.67
	(6.779)	(9.886)
Observations	49	43
R-squared	0.389	0.729

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3
Multiple Regression Analysis (OLS) of Creative Outputs as Predictors of SWB

Note. Robust standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

VARIABLES	(1) Percent Thriving	(2) Percent Thriving
New businesses/th pop. 15–64	-0.0435	-0.205
	(0.224)	(0.228)
Scientific & technical articles/bn PPP$ GDP	-0.0905	0.0387
	(0.0686)	(0.0901)
Domestic resident patent app./tr PPP$ GDP	-0.200***	0.0402
	(0.0464)	(0.458)
Citable documents H index	0.0165***	0.00321
	(0.00523)	(0.00735)
Domestic resident trademark app./bn PPP$ GDP	0.00674	-0.00392
	(0.0262)	(0.0257)
National feature films/mn pop. 15–69	0.345**	0.237
	(0.140)	(0.150)
Printing & publishing manufactures, %	116.9*	101.8
	(63.31)	(69.18)
Urban population (% of total)		0.148
		(0.104)
Age dependency ratio (% of working-age population)		0.0731
		(0.193)
Unemployment, total (% of total labor force) (national estimate)		-0.776***
		(0.284)
GDP per capita growth (annual %)		0.292*
		(0.172)
Income share held by highest 10%		0.589**
		(0.278)
Constant	19.33***	-3.316
	(3.103)	(13.29)
Observations	61	52
R-squared	0.229	0.461

Table 4

Multiple Regression Analysis (OLS) of Monetization of Creative Parameters as Predictors of SWB

Note. Robust standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

VARIABLES	(1) Percent Thriving	(2) Percent Thriving
Royalty and license fees, receipts (% of total trade)	2.206***	0.786
	(0.699)	(0.932)
Cultural and creative services exports (% of total trade)	2.151*	0.0126
	(1.268)	(1.026)
Creative goods exports (% of total trade)	0.00277	-0.528
	(0.356)	(0.433)
Urban population (% of total)		0.230***
		(0.0736)
Age dependency ratio (% of working-age population)		-0.0624
		(0.0808)
Unemployment, total (% of total labor force) (national estimate)		-0.499***
		(0.185)
GDP per capita growth (annual %)		0.453**
		(0.225)
Income share held by highest 10%		0.498*
		(0.292)
Constant	17.75***	0.263
	(1.640)	(11.69)
Observations	80	62
R-squared	0.070	0.388

Table 5
Correlations between Creativity Inputs, Outputs, and SWB

Note. [+]Spearman's rho was computed for this correlation as the sample size was smaller than 30.

	Percent Thriving	p	n
Creative Inputs			
Number of researchers per million	0.2305	0.0189	104
Private (household) cultural expenditure	0.2232	0.166	40
Government spending on culture and recreation[+]	-0.1368	0.496	27
Venture capital deals per GDP	0.3819	0.017	65
MSMEs employment share in the economy (%)	-0.1045	0.296	102
Creative Outputs			
Patent Cooperation Treaty resident applications	0.3131	0.001	99
National office resident utility model applications	-0.2315	0.08	58
Madrid System trademark applications by country of origin	0.2528	0.376	68
Global entertainment and media output	0.3976	0.003	54

Table 3
Multiple Regression Analysis (OLS) of Creative Outputs as Predictors of SWB

Note. Robust standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

CHAPTER EIGHT

THE SYMBIOSIS OF CREATIVITY, INNOVATION, AND WELLBEING

JENNIFER A. QUARRIE

Introduction

Throughout time, humans have utilized creativity and innovation to strive for wellbeing as a means to thrive. From maintaining individual welfare to progressing culturally, the acts of creating, innovating, and pursuing wellbeing are primary ways that we as a species recognize, value, and foster fundamental and evolving human needs.

The idea of pursuing and achieving wellbeing has become a higher priority over recent centuries as a deliberate means to increase the quality and meaning of human life. Likewise, the modern acknowledgement of creativity as a pivotal human skill set has led to the development of processes aimed at more efficiently using natural human creativity, at times in the form of innovation and invention. Given the value of wellbeing to individuals, it took little time for humans to begin deliberately applying creative processes and problem solving to actively enhance wellbeing. Conversely, increasing exploration and study of wellbeing elements has demonstrated that holistic personal wellness practices nurture the cognitive, affective, and somatic systems that are critical for successful creativity and innovation.

Creativity and wellbeing are symbiotic in that they have the power to significantly enhance one another and, in doing so, help individuals strive for continuous and purpose-driven improvement and change. The processes behind creativity, innovation, and wellbeing aim to foster hope and problem solving in a way that more fluidly develops and transitions solutions into reality.

Defining Wellbeing, Creativity, and Innovation

Given the relative youth of these fields academically, there has been contention amongst experts over even the basic definitions of wellbeing, creativity, and innovation.

Wellbeing and wellness. Despite the fact that mainstream sources have defined wellness as nearly synonymous with health, such as "the quality or state of being in good health especially as an actively sought goal" (Wellness, n.d.), and in turn used wellness to define health, as in "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization, 2004, p. 28),

experts in the field believe that wellness is not merely a state but, critically, a process of striving for that state: "wellness is an active process through which people become aware of, and make choices toward, a more successful existence" (National Wellness Institute, n.d., Definition of Wellness section, para. 3). The National Wellness Institute (n.d.) collaborated with other health and wellness leaders and generally agreed that, "wellness is a conscious, self-directed and evolving process of achieving full potential; wellness is multidimensional and holistic, encompassing lifestyle, mental and spiritual well-being, and the environment; wellness is positive and affirming" (Definition of Wellness section, para. 2). The University of California Davis (UC Davis, n.d.) emphasized the fact that wellness is a change process when it stated that, "wellness is more than being free from illness, it is a dynamic process of change and growth" (p. 1).

The concepts of wellness and wellbeing have also been increasingly differentiated from one another, from the general, "wellbeing is the state of being happy, healthy or successful" (Wellbeing, n.d.), to the conceptual, "building a life of vitality, purpose, and resilience" (Center for the Advancement of Well-Being, n.d.), to the contextual, "well-being is a positive outcome that is meaningful for people and for many sectors of society, because it tells us that people perceive that their lives are going well… [it] generally includes global judgments of life satisfaction and feelings ranging from depression to joy" (Center for Disease Control, 2016). The most critical concepts to note are that wellbeing is a process rather than just a state, it centers around a conscious purpose and it focuses on positive change.

Some wellness resources and programs have differentiated wellness into elements of mind, body, and spirit (Jasperson, n.d.; Tunajek, 2012). Expert institutions expanded the set into a holistic model of six (National Wellness Institute, n.d.) and then eight interdependent elements (University of California Davis, n.d.; see Figure A), including:

- *Physical* - The benefits of regular physical activity, healthy eating habits, strength, and vitality as well as personal responsibility, self-care, and when to seek medical attention;
- *Emotional* - Self-esteem, self-control, and determination as a sense of direction;
- *Spiritual* - The development of belief systems, values, and creating a world-view;
- *Social* - How a person contributes to their environment and community, and how to build better living spaces and social networks;
- *Occupational* - The enrichment of life through work, and its interconnectedness to living and playing;
- *Intellectual* - Creative and stimulating mental activities, and sharing your gifts with others;
- *Environmental* – Living interactively with your personal environment and nature in a way that is respectful and protective; and
- *Financial* – Learning how to successfully manage financial ex-

penses and support other areas of your life.

Wellbeing

Figure A. Eight interdependent elements of wellbeing (University of California Davis, n.d.).

    Creativity. According to Runco and Jaeger (2012), the standard definition of creativity requires both originality and effectiveness. Creative problem solving (CPS, Puccio, Mance, Switalski, & Reali, 2012) most often uses Stein's (1953) definition that creativity is both novel and useful. A more preferred version of Stein's (1953) definition is that creativity is the generation of something that is both novel and valuable, since value can be derived from more than just use (Quarrie, 2015b). The primary lenses through which to view creativity are best described by Rhodes' (1961) four P's model, which showed creativity as a combination of people, products and processes all within the influence of press (i.e. environment or context). (see Figure B) Models of applied creativity, such as CPS (Puccio, Mance, Switalski, & Reali, 2012), emphasize creativity as a deliberate change process that becomes a more powerful tool when including meta-affective skills and used holistically (Puccio, Mance, & Murdock, 2011).
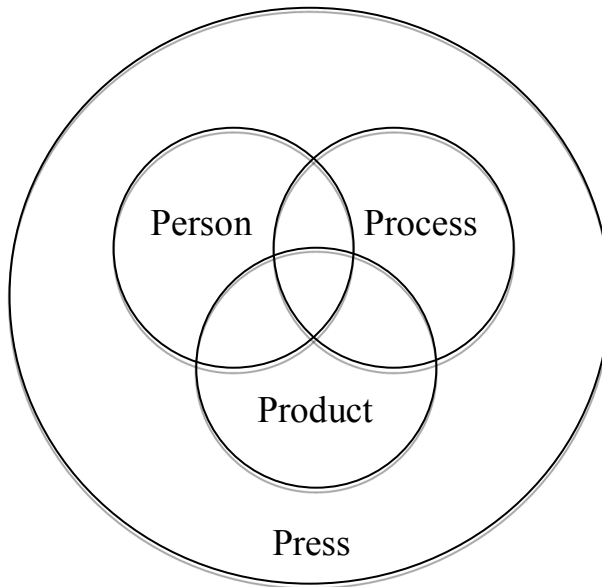
Figure B. The 4 Ps Model of Creativity (Rhodes, 1961).

In addition to Rhodes' (1961) 4 Ps Model, CPS (Puccio, Mance, Switalski, & Reali, 2012) also provides useful context to creativity. While this model evolved over time in different directions, one approach, FourSight (originally Buffalo Creative Process Inventory), was honed by Puccio (1999, 2002) and featured the four primary types of information processing that emerged from his research on cognitive preferences, which map to the steps of the CPS process: clarifying, ideating, developing and implementing.

    Innovation. The layman's way of differentiating creativity from innovation involves relegating thinking, imagination, and ideation as creativity while separating out development and implementation as innovation. However, academically accepted models of creativity, such as CPS, include development and implementation as well (Puccio, Mance, & Murdock, 2011). As a result, the primary differentiators between creativity and innovation seem to come down to intent, context, and use. While both creativity and innovation are purpose-driven, it appears that innovation usually has a more narrow intent to solve a problem that is relevant at an enterprise or global scale. It is reasonable to assume that this is why innovation is most commonly discussed within large-scale contexts such as the business world, national government, or broad markets. For innovation, the more widely applicable and useful, the better. For creativity, the spectrum of value is larger and includes mini-c (personal level) or little-c (everyday) creativity, as well as Big-C (large scale) results of eminent creators (Beghetto & Kaufman, 2007). That said, the majority of innovation in our lives is, to apply Beghetto and Kaufman's (2007)

definitions, mini-i or little-i innovation. The difference is that such innovations are usually not as broadly used due to the fact that they are situationally dependent and often driven by personal or niche needs. As innovators connect more readily across the globe, there is greater opportunity for little-i innovation to scale upward to Big-I innovation, should others share the same need. Finally, while most academics agree that for something creative to have value, it must be acted upon in some form in order to bring the idea or product out of mind and into existence, there is no requirement for it to be readily used. In contrast, a new and valuable product cannot be considered innovation if it is not used. As a result, innovations are more commonly processes or products, and the process of innovation focuses more intently on the development and implementation stages to ensure that use.

Current State of Creativity, Innovation & Wellbeing

Within the practice of applied creativity and innovation, problems of every scale abound. Yet when properly clarified and deconstructed, many problems that appear organizational, social, or logistical unfold to have origins in more personal needs. Despite living in a world of immense wealth, opportunity, and advanced technology, many struggle to find effective ways to pursue or achieve personal wellbeing. Add to that the accelerating rate of cultural change resulting from advancements in fields like technology, communications, and data, and formerly stable areas of life now move faster than most can keep up with. Mounting expectations and responsibilities increase tension when placed against the same twenty-four hour day that once had a more manageable pace. To navigate and meet cultural demands, many rob their own personal foundational needs like sleep, nutrition, and supportive social relationships (Maslow, 1943), thus destabilizing their own wellbeings and setting up habits that are untenable over the long term.

What happens to individuals in these situations? Some may live lives of bias and imbalance to the point of illness, often for quite altruistic and responsible reasons. From there, they may experience severe loss, not only through the quickly changing culture, but also in their unmet personal needs, declining health, broken social bonds, and waning confidence and trust in the social institutions that continue to demand more when individuals are operating above capacity already. Over time, as more of the population experiences the same, there comes an overall degradation of confidence and trust in social institutions (NPR, 2017; Wartzman, 2017). It is often unavoidable that what happens to these individuals then happens to the organizations (companies, institutions, nations, alliances), and ultimately happens to cultures (family, local, global). To balance and improve these trends and avoid the harm coming from fractured institutions and culture, there must be a deliberate and powerful counter-effort to help individuals gain wellbeing. Creativity and innovation are processes that are strong and effective enough to aid individuals in solving problems in their own circumstances, in order to shift the pen-

dulum in the other direction.

The approaches currently in place to pursue wellbeing do not appear to be meeting the increasing needs and resultant demands of the populace. The recent rise of positive psychology addresses part of the deficit left by mainstream psychology's problem-focused approach that has dominated the field for decades (Peterson, 2008), but remains nascent and has a long way to go before it is fully integrated into the field. Wellness industry providers may sometimes miss the mark by offering solutions that do not integrate well with organizational culture, addressing general topics rather than specific needs, focusing on symptoms rather than root causes, or worse, prioritizing business ends to the detriment of employees or clients (Fry, 2017). Regardless of origin, many offerings are short-term services or temporary interventions rather than permanent solutions, and build reliance on service companies rather than empowering the individual.

CPS (Osborn, 1953; Parnes, 1967, 1992; Treffinger, 2007) and similar creative processes can be some of the most effective ways to achieve valuable and lasting change that is customized to specific needs, and are thus approaches that should be prioritized when it comes to pursuing personal wellbeing. By leveraging creativity, individuals may be able to maximize the benefits that come from various unexpected changes; pioneer positive change in their own lives; and minimize or more realistically frame loss, uncertainty, and risk in ways that make it easier to identify, develop, and implement effective solutions. This is an era of both personalization and personal responsibility. In this light, creativity and innovation are cultural imperatives for wellbeing. By deliberately bringing the fields of creativity, innovation, and wellbeing together in a way that is beyond the theoretical, the power of personal, experiential learning can enhance the already robust overlap between them (Meier, 2000).

Overcoming Bias. Yet if creativity is such an effective approach, why don't we see the fields of creativity, innovation, and wellbeing together more often? Historically, from psychological research to modern media, creativity has received an inordinate amount of attention in relation to mental *illness* as opposed to *wellness*. Amazon.com, bookstores, and libraries offer dozens if not hundreds of books with the words *creativity* and *madness/illness/ depression* in their titles, but few containing *creativity* and *wellness/ wellbeing*. Academic research (Abraham, 2014; Frosch, 1987; Kaufman, 2014; Silvia & Kaufman, 2010) and popular culture reinforce the stereotypical link between creativity and illness through movies (Zaentz, 1984), music (Heller et al., 2010), and even an annual conference dedicated to creativity and madness (Creativity and Madness, n.d.). In fact, "the romantic notion that mental illness and creativity are linked is so prominent in the public consciousness that it is rarely challenged" (Kaufman, 2013).

Schlesinger's 2009 work helped debunk some of the original studies by Jamison (1989, 2003), Andreasen (1987, 2005), and Ludwig (1995), which are most frequently cited to link mental illness and creativity. Schle-

singer (2009) criticized several elements and questioned the studies' validity based on their "small, highly specialized samples with weak and inconsistent methodologies and a strong dependence on subjective and anecdotal accounts" (Kaufman, 2013). More recently a 40-year study of approximately 1.2 million Swedish people concluded that individuals with scientific or artistic occupations were not more likely to suffer from psychiatric disorders, and that mental illness did not increase the probability of entering a creative profession, with the singular exception of those with bipolar disorder, who were 8% more likely to do so (Kyaga et al., 2013).

Encouraging a positive approach to change. Beyond answering the critical and expanding social need for wellbeing and overcoming years of research bias, exploring the links between creativity and wellbeing also bring the added benefit of encouraging and teaching a more positive approach to change within global culture. In an age of growing constraints, particularly on time and attention, it is more important than ever to 'work smart' by spending resources wisely and using effective methods to overcome hurdles and barriers. It is also imperative to expand one's mindset and recognize that change is not merely about avoiding negative consequences or threats, but also about seeing the real potential for a better or different existence and actively seeking it. By expecting and becoming more comfortable with uncertainty, risk, loss, and transition, individuals can increase their abilities to function and grow within those spaces rather than freeze, fight, or fly. It requires practice to operate outside of one's comfort zone, yet in doing so individuals develop the ability to monitor, navigate, and mitigate difficult situations without reacting in the extreme or treating them as threats. We see this emphasized within modern wellbeing trends by the current focus on resilience (Brown & Westaway, 2011; Fava & Tomba, 2009).

Parallels between Creativity, Innovation and Wellbeing

Before exploring in more detail the interplay between creativity, innovation, and wellbeing, it is important to note that they share an impressive number of parallels across intent, scope, scale, requirements, approach, process, people, products, environments, and results. Understanding how these fields operate in similar ways bolsters a greater appreciation for how they integrate in symbiotic ways.

Intent. Creativity, innovation, and wellbeing are all elements that improve our lives in new, valuable, and meaningful ways. They each aim at moving individuals beyond the status quo from existence and survival through important needs, ideally toward a state of thriving much akin to Maslow's (1943) hierarchy of needs. In fact, the core areas of wellbeing map very closely with Maslow's (1943) hierarchy (see Figure C), and it may be useful to consider this hierarchy when determining which areas of wellbeing one wishes to work on first.
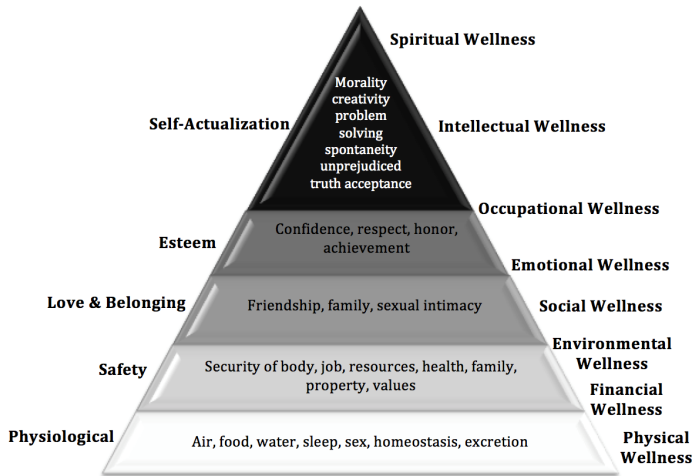
Figure C. Maslow's (1943) Hierarchy of Needs aligned with the Seven Dimensions of Wellness (Quarrie, 2015b).

While Maslow's (1943) hierarchy is a useful tool to understand how needs build upon each other, the reality is far more fluid. Humans strive for the upper levels of needs and wellbeing without necessarily fulfilling all of the levels below. They move up and down the gradient addressing ever-connected needs, ideally using each level to aid the others in achieving wellbeing. According to Quarrie (2015b), "Alderfer's (1969) frustration/regression principle stated that if a higher level need remains unfulfilled, a person might regress to lower level needs that appear easier to satisfy" (p. 18). In creativity, innovation, and wellbeing, this is sometimes apparent when people work to solve the wrong problem. This also shows up in wellbeing when people treat symptoms rather than an ailment or root cause.

From the context of the 4 Ps model (Rhodes, 1961; see Figure B), creativity, innovation, and wellbeing help to deliberately create new processes, products, and press as a means of fostering improvements and changes in many things, including people and culture. Pursuing wellbeing is an example of person-oriented creativity and innovation through changes in mindset, perspective, and behavior. Likewise, creativity, innovation, and wellbeing aid in identifying old processes, products, and press that are destructive, obsolete, or useless and should thus be let go to make room for new, more effective measures. The big picture thinking that is required by creativity, innovation, and wellbeing helps to identify value decline and frame such loss as positive change.

Scope & Scale. Creativity, innovation, and wellbeing all share a broad and high-level scope that includes all elements of a situation in one set of

integrated variables. As holistic models, they recognize that each element affects all others and, as a result, that working within such context requires systems thinking, a management discipline that understands a system by examining the linkages and interactions between the components that comprise the entirety of that defined system (Tate, 2009). What makes them each even more powerful is that they work at a potentially infinite scale. That is, from a process standpoint, creativity, innovation, and wellbeing all begin with big picture thinking, deliberately placing a singular need in larger context. Yet the process for each begins at a personal level of fundamental understanding, and leads up through the spectrum to expansive exploration. Likewise, the impact of each begins with the micro level of personal fulfillment through tactical, implementable change efforts and can be felt all the way up through the macro level of global stewardship. This reflects how we naturally tend to experience life by beginning with a single event, change, or need that shifts the larger perspective and motivates changes, which then trickle throughout every other area of life. The perspective this generates is often one of the first shifts in mindset where individuals begin to differentiate between personal and social ideals (e.g. being one's best self vs. fitting an external expectation).

Given the holistic nature of creativity, innovation, and wellbeing, focusing on any one subcomponent would create a significant imbalance and could even prevent the realization of wellbeing or creative outcomes. The creative process helps to ensure that all elements are treated as a system and remain in balance so as not to diminish or strain the others.

Requirements. Given their system-wide impact and personal reach, creativity, innovation, and wellbeing also share similar requirements for success, only a few of which are highlighted here. One of the most important requirements is mindset – not only an awareness of one's own needs and deficits, or mindfulness of how those needs arise and become fulfilled, but also a mindset tuned to growth (Dweck, 2006; Satell, 2016), shifting perspectives, and learning from experiments and experiences. Another critical requirement, yet one of the most difficult given modern cultural demands, is the ability to make and hold space, to include time, resources, energy, focus, and place, where creativity and innovation can iterate and develop current ideas and challenges towards more ideal solutions. Good results can take time, and thus require patience and dedication to continue pushing forward. Successful corporate innovation programs have figured this out and ensure that their innovation, research, and development are separated from the pressures of sales, billability, and daily delivery demands. In fact, beyond administrative separation, many firms go so far as to build physical environments that include play, nature, natural light, and other elements proven to encourage creative and collaborative behavior and success (Quarrie, 2015a). Finally, the mindsets of creativity, innovation, and wellbeing require the realization and acknowledgement that industrial-era, one-size-fits-all, cookie-cutter solutions, while perhaps easy and obvious, may fail to qualify as the best possible solutions. In contrast, approaches generated through creativity, innovation, and

truly personalized wellbeing practices will be tailored and customized, and thus have a greater chance of solving the root problem.

Of course, although tailored and customized practices may be ideal for an individual, at times they can create tension between the individual's path and the social convention and expectation of the time. As a result, individuals must prepare their mindset to address where they will seek social support and permission, and where they will have the strength and courage to rebel against social norms.

Approach. Creativity, innovation, and wellness practices must begin with a clearly defined need from which goals can be derived. Such needs can be either reactive responses to triggers in the environment or proactive searches for need fulfillment and idealistic change. Each of the three practices succeed through dedicated work and deliberate design, which rely on taking personal ownership and responsibility to lead the way forward and transform one's own life. To do so most effectively, it is best to work on needs that one finds motivational and inspirational.

Harnessing intrinsic motivation is important for several reasons. Motivations help us to intuitively and emotionally define our priorities when we may be cognitively conflicted. This essentially amounts to following one's own energy and working on what gives the most energy in return for investment. It sets up a more finely tuned system that uses energy more efficiently, where more can be achieved with less work or tension. Further, personal motivations are often rooted in deeper motivations that may not be consciously recognized. They drive not just toward personal survival, but social and species survival as well.

It is worth noting that Rothenberg (1990), a Harvard psychologist, spent over 2,000 hours over a span of decades interviewing creative people and gathering data to refute the link between mental illness and eminent creativity. In the process of doing so, Rothenberg (1990) discovered that only one characteristic was omnipresent for all creative people he interviewed: motivation.

> Only one characteristic of personality and orientation to life and work is absolutely, *across the board*, present in *all* creative people: motivation . . . they want *specifically* to create and to be creative, not merely to be successful or effective or competent. (pp. 8–9)

The idea that intrinsic motivation is a critical component for creativity supports one of the premises behind the Thinking Skills Model of CPS (Puccio, Mance, & Murdock, 2011), that one requires motivation, ownership and interest to successfully solve a challenge (Miller, Vehar, Firestien, Thurber, & Nielsen, 2011; Puccio, Mance, Switalski, & Reali, 2012; Treffinger, Isaksen, & Firestien, 1983). Given increasing research and understanding of the relationship between motivation and creativity (Hennesey, 2010), outcomes may lend insight toward the important role of motivation within wellbeing.

Process. In an ideal world, creative problem solving, innovation, and pursuing wellbeing all follow deliberate methodologies. The methods func-

tion to ensure that no steps are left out, all steps follow a logical and cognitively resonant order, and the individual follows through to the end, ensuring implementation and use of the solution. There are a plethora of methods and processes dedicated to creativity and innovation (e.g. CPS (Osborn, 1953; Parnes, 1967, 1992; Treffinger, 2007), Design Thinking (IDEO U, n.d.), Lean Startup (Ries, 2011), Agile (Fowler & Highsmith, 2001), Waterfall (Bell & Thayer, 1976; Royce, 1970), Human Centered Design (IDEO.org, n.d.), and more (VanPatter & Pastor, 2016), some of which, like CPS, may be well adapted specifically for wellbeing. While each has its strengths, different processes work better for different scenarios and individuals. Rather than extol the virtues of one process over another, it is more valuable in this context to note their common strengths. It is helpful to reference the 4 Ps model (Rhodes, 1961) when considering processes: any process one uses should consider the roles of the people, products, and press involved.

People. While theoretically one could begin anywhere in the 4 Ps model, best practices within creativity, innovation, and wellbeing all show that it is ideal to start with the person or people involved (Ovans, 2015; Sneller, 2016). After all, people identify needs, people clarify what problems to solve, people generate ideas and connect concepts in new ways, people develop solutions in unique ways, and people craft and deliver custom implementations.

It is important to consider that many successful processes have emotional and intuitive aspects to them – or, in other words, human aspects. For example, the Thinking Skills Model of CPS (Puccio, Mance, & Murdock, 2011) integrates the influences of humanistic and positive psychology, including the work of scholars Maslow (1943), Rogers (1961), and Csikszentmihalyi (1991, 1997). To enhance creative function, the Thinking Skills Model pairs key cognitive skills with supporting affective skills, including mindfulness, dreaming, sensing gaps, playfulness, avoiding premature closure, sensitivity to environment and tolerance for risks (Puccio, Mance, & Murdock, 2011). In a similar vein, IDEO's Design Thinking approach begins with empathy (IDEO U, n.d.) and their human-centered design emphasizes the idea that products, processes, and places should be built to human strengths rather than unintuitive technical traditions (IDEO.org, n.d.). The lean startup approach relies heavily on customer development to iteratively test their hypotheses and revise their assumptions (Blank, 2013; Ries, 2011).

Broader business and social cultures seem to be following the same affect-oriented trend with an emphasis on emotional intelligence as a critical life skill, particularly for success in leadership and other socially oriented positions. Leading part of that charge were Goleman (2006) and Davidson (2012), who emphasized some of the same skills critical to creativity and wellbeing: self-awareness, self-confidence, acceptance, compassion, self-control, adaptability, initiative, conflict management and building bonds.

Product. The products of creativity, innovation, and wellbeing span a broad spectrum of results, but should ideally include increased awareness,

experience-based learning, shifts in mindset and perspective, increased personal agency, and insights toward the self. These products are much more successfully achieved through specific goals and milestones set. Artifacts of wellbeing such as schedules or rule sets are indeed products, yet the majority of wellbeing products are less tangible. For example, personal change in thinking tends to show itself as change in doing (behaviors and actions), which then manifests as a change in being. The change begins by building new neural pathways for thought, and results in building behavioral and life pathways.

Press. Creativity, innovation, and wellbeing are all heavily dependent on both cultural and physical environment. Striving for change without support can be a recipe for failure before even beginning. While environment may seem like a variable that is outside of one's influence or control, that is actually not the case (Quarrie, 2016). Success often hinges on one's ability to assess and recognize environmental factors, aggregate a tribe of believers and supporters, identify champions, and work in a space that fosters freedom of thought as well as iterative development. Arranging or at least influencing one's physical and cultural environment in favor of positive outcomes is a key responsibility of anyone involved in creativity, innovation, or the pursuit of wellbeing.

Results. Overall, the results of successful creativity, innovation, and wellbeing will be valuable change. Going through such processes most commonly results in personal change and the development of new paths forward. It can also manifest as local change in the form of influence, protecting communities, and pivoting resources. In this case, change in thinking leads to change in doing, which can build change in local trends, resulting in cultural change and change in being for large swaths of the community. Global change becomes an extension of such local change. Smaller trends can scale exponentially, creating disruption and new markets as well as increasing selection, choice, and consumer welfare through personal awareness and responsibility. The challenge resides in ensuring that new changes bring increased value and offer transition from obsolete models.

The Symbiosis of Creativity, Innovation & Wellbeing

In considering creative thinking processes, it becomes apparent that innovation is a particular type of creative thinking, with specific models adapted to get solutions through development and implementation in particular environments. Wellbeing could thus be viewed as a specific set of creative thinking efforts resulting in personalized innovations within the key areas of personal wellness.

Yet the relationship between creativity, innovation, and wellbeing exceeds that of process; it also parallels across intent, scope, and scale. Creativity and innovation can directly develop customized paths toward wellbeing through problem solving. In turn, effective and holistic personal wellness

practices nurture the cognitive, affective, and somatic systems that drive effective creative and innovative thinking and practices. This symbiosis is validated and reinforced by specific neurobiology.

Neurobiology of healing. Neuroscience research shows that when the brain is producing alpha waves, the brain and body are usually in a state of alert relaxation. The alpha wave brain state affects the body in a multitude of ways, to include both promoting creativity and assisting the body to self-heal (Benedek, Bergner, Könen, Fink, & Neubauer, 2011; Carson, 2011; Fink & Benedek, 2013; Fink & Benedek, 2014; Foxe & Snyder, 2011; Khasky & Smith, 1999; Kounios, Frymiare, Bowden, Fleck, Subramaniam, Parrish & Jung-Beeman (2006); Sternberg, 2009). Specifically, a growing body of psychological research indicates that the alpha wave brain state of alert relaxation combats stress and its destructive physiological implications, thus creating an optimal state for physical healing (Sternberg, 2009) and fostering part of the journey toward wellness. With this in mind, it stands to reason that wellness practices that promote healing may also promote creativity, not only in the form of the conscious and deliberate application of creative problem solving toward achieving wellbeing as a goal itself, but also in the raw human tendency to create and subconsciously reap the benefits of the alpha wave state. This may explain why some who are mentally ill are drawn heavily to creative pursuits, and why creative therapies are such an effective form of the management and treatment of illness (Donnelly, 2007; Rogers, 2000). Patients could, in effect, be self-medicating by inviting the alpha wave brain state through creative activity, therein lowering cortisol levels and achieving the calm, mental clarity that may otherwise be difficult to achieve. The same positive and healing effects work on all humans, and within the realm of positive psychology a version of the alpha wave state is known as *flow*, a mental state where an individual performing an activity is fully immersed in a feeling of energized focus, full involvement, and enjoyment in the process of the activity (Csikszentmihalyi, 1991). In fact, the role of flow in discovery and invention demonstrates tremendous overlap with creativity and innovation (Csikszentmihalyi, 1997). It is also important to consider studies that show an increase in alpha wave activity and focus during meditation (Coppola & Spector, 2009; Davidson et al, 2003; Ding, Tang, Tang, & Posner, 2014; Kabat-Zinn, 1994); while meditation increases wellness, it is also a common form of incubation in problem solving and creativity.

Wellbeing fosters creativity. Conversely, wellness practices such as yoga and maintaining a strong, positive social network are shown to assist somatic and cognitive function (Broad, 2012; Orth-Gomér, Rosengren, & Wilhelmsen, 1993; Pilkington, Kirkwood, Rampes, & Richardson, 2005; Roach & McNally, 2004; Rosengren, Wilhelmsen, & Orth-Gomér, 2004; Ross & Rosewood, 2003; Uchino, 2009). The more robust the mind and body, the more resources it can bring to bear for creativity. Cognition research validates the need for physical, psychological, social, and other types of wellbeing for optimal cognitive function, which includes the thinking and

affective skills required for creativity and innovation. Further, experiencing the journey toward personal wellbeing drives insights toward what makes creativity so fundamentally valuable.

Our cultural habits and life experiences also tend to validate the role of wellbeing in creativity. For centuries, eminent creators have relied on daily relaxing habits such as walks in nature, exercise, naps, or baths to help keep creativity flowing for their work (Currey, 2013; Popova, 2012, 2013). Modern day executives are known for quirky habits like walking meetings, and even elite government leaders retreat to relaxing locations when working through tough problems or facilitating fragile discussions (Hayes II, 2017; White House, n.d.). Everyday solutions tend to arrive not during drawn-out office meetings, but when individuals are behaving in ways that drive wellbeing – walking the dog, taking a shower, falling asleep.

Creativity and wellbeing as paths toward self-actualization. Exploring one's own creativity, innovation, and wellbeing are exceptionally personal journeys that dive deep beyond the surface of mere thinking skills, into lesser-known areas of the self that many people tend to ignore in their everyday lives. It is in these deeper realms where people begin to learn about their cores. Who are we as people? How have we formed our stories from our experiences? What is at the root of our motivations? What is our personal potential, and how might we realize it?

As part of a journey in self-understanding, one may re-identify and reconnect with fundamental personal needs. Addressing these needs is part of wellbeing and provides a foundation for self-actualization – fulfilling one's potential and becoming the best possible version of one's self (Rogers, 1961). This humanistic perspective asserts that an individual can be at her best and reach her full potential when her environmental conditions are optimized. Creativity, innovation, and wellbeing are some of the best ways to optimize conditions. Coming full circle, as individuals become more self-actualized, their insights and experiences may help increase and maintain creativity and wellbeing as driving, symbiotic forces within their lives.

The spirit of wellbeing is captured well in the Greek term *eudaimonia*, sometimes translated as 'happiness or welfare,' but perhaps more accurately, "human flourishing". It may be an early form of humanist self-actualization, as eudaimonia is considered a self-realization theory promoted by Aristole that makes happiness or personal wellbeing the chief good for man (Boniwell, 2008; Eudaimonia, n.d.).

Creativity and wellbeing are paths toward self-actualization. Some might even say that wellbeing is a foundation that figures into every aspect of creativity, from intellect to broadening experiences, from comfort with novelty to adjustment, and from change to awareness of personal goals and needs. Without wellbeing, problem solving on a cognitive level can become sidetracked by the need to recover wellness or the consequences that the lack of wellness brings.

How to Leverage the Symbiosis of Creativity, Innovation, & Wellbeing

Modeling the relationship. Creative thinking and problem solving lead to insights and innovations that foster and bring about wellbeing. The iterative nature of the symbiosis of creativity, innovation, and wellbeing may be most simply demonstrated in a cycle (see Figure D).
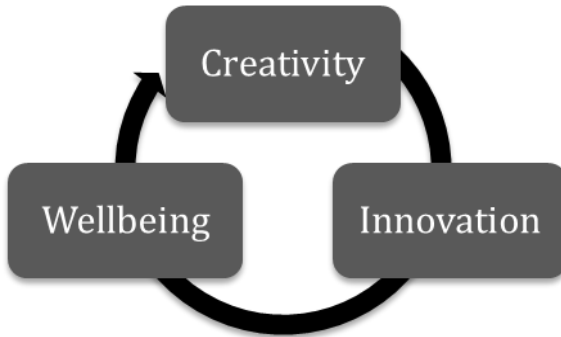

Figure D. The symbiosis of creativity, innovation, and wellbeing.

From the standpoint of wellbeing, it may be worth considering a model that places creativity and spirituality at the hub of a wheel (see Figure E). This visual highlights the role of personal values in driving wellbeing needs, as well as personal creativity in fulfilling those needs. It also functions in a similar way to the *Wheel of Awareness* (Mind your Brain, Inc., 2007) popularized by Siegel (2010), a visual metaphor of the mind that represents the human experience of awareness in the shape of a wheel, where calmness, clarity, and openness form the hub of the wheel, the spokes represent different ways of experiencing the world (such as senses, body and mental activity), and the rim represents anything in the world it is possible to become aware of. The idea is that one can travel back and forth between intensely experiencing the world and re-centering in the hub of personal calm. This parallels the use of creativity to pursue specific goals within each element of wellbeing, yet always returning to the hub to iterate as the world changes.
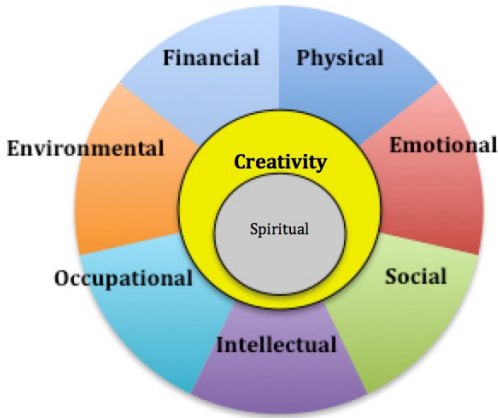
Creative Values-Driven Wellbeing

Figure E. Creative values-driven wellbeing.

Set an intention. To use the creative process in pursuit of wellbeing, begin by identifying the most critical needs and setting priorities based on the larger vision. Like creativity, innovation, and wellbeing themselves, we can expect this process to continually grow over time through both the changing environment and the iterative creative process we apply. Learn through experiences by associating new information with current knowledge. Continue trying when some solutions do not end up working. Remember that paving a new road is difficult – as we learn, we build new neural pathways, and by applying that learning, we build new behavioral and life pathways.

Connect. Connecting with others who value creativity, innovation, and wellbeing is pivotal to maintaining momentum, nurturing ongoing work, leveraging existing micro-cultures, and finding new resources that assist, stimulate, and build on the current foundation. Continually expanding connections not only serves as a stimulating stream of new information and perspectives that enhance divergent thinking, critical for creativity and innovation, but it also significantly bolsters health and longevity, which help extend the creative habit and impact through a longer lifetime.

Build awareness. Acknowledging and exploring the links between creativity, innovation, and wellbeing will help build awareness around this critical area of study. By sharing these insights publicly and helping others understand and apply these findings to improve their own lives, the impact of these insights may increase for the good of everyone involved. To do so, one must start where creativity, innovation, and wellbeing begin—with people. Work to listen to the self, build courage and confidence, shift perspectives,

recognize the value of fulfilling one's own needs, and increase self-care, self-compassion, and empathy. Each of these actions will foster a stronger understanding of personal identity and agency and build the foundation required to pursue creative problem solving toward wellbeing, and leverage wellbeing to enhance creativity and innovation.

   Continued research. One of the most effective ways to build awareness and deliberately direct attention toward this important topic is through research, publication, and application. This meaningful effort empowers individuals to add value not only to their own lives, but to society at large. There are many avenues through which one can contribute and actively pursue progress in a committed way. By building on research in the realm of wellness with positive psychology such as self-actualization and flow (Csikszentmihalyi, 1997; Kashdan & Ciarrochi, 2013; Maslow, 1943; Rogers, 1961; Runco, 1999), self-care and healing through creative activity (Quarrie, 2015a; Robin, 2010; Rogers, 2000; Sternberg, 2009), the theory of mini-c creativity and the everyday creativity movement (Beghetto & Kaufman, 2007; Richards, 2010; The State University of New York, 2015), and harnessing possibility (Assaraf, 2013; Goswami, 2014), the field of creativity may more clearly delineate specific ways that creativity and innovation can build wellbeing, and the nuanced ways that wellbeing fosters creativity and innovation.

   Find an entry point. There is a plethora of ways to approach wellbeing. If you are having trouble discerning which route to take, consider using creative problem solving or following your energy toward what interests you most. Core areas of wellbeing such as sleep, nutrition, mindfulness, movement, and social interaction may be areas of interest prime for experimentation (Quarrie, 2015b).

   Alternately, recovering from a recent hardship or trauma may lead to a valuable place. Recent research on post-traumatic growth has demonstrated the tendency for individuals to experience significant surges in creativity following a trauma, which assist in recovering and making strides toward wellbeing (Kaufman & Gregoire, 2016).

   Get unstuck. Experiencing a mental block while thinking your way through a problem? Use wellness practices to get going again. Research in somatics shows that moving the body is one of the most effective ways to unblock the mind (Rath, 2013; Strozzi-Heckler, 2014). "The body is the field, the place, where it all goes down. We feel anger, fear, desire, loss, madness, and boredom on the field of our bodies, our emotions" (Gates & Kenison, 2010, p. 307). Those who understand this view of the body tend to treat it differently, better understand its signals, and accept the wisdom that comes through it. When you think about it, the body provides a gateway through which creative ideas transform and enter into the world (Quarrie, 2015b). Moving out of the realm of the cognitive empowers an individual to expand the types of intelligence brought to bear in creative endeavors, to include intuition, presence, and secondary senses.

Find balance. One could spend every waking minute of every day dedicated to personal wellbeing or creative and innovative pursuits, yet still never attain perfection. Practicing creativity, innovation, or wellbeing requires balancing amongst the forces in life and leading the future. The resources required to pursue creativity, innovation, or wellbeing can easily divert resources from other life endeavors. This means prioritizing needs and recognizing that creativity, innovation, and wellbeing are means as much as they are ends. Using the creative process helps maintain balance between the internal and external, self and others, reality and possible, current and future, and leading and following along the journey to wellbeing.

Conclusion

Wellbeing, creativity, and innovation are all ways to improve our lives in new, valuable, and meaningful ways. They are each holistic models that address a full system of variables in concert and aim for continual, iterative improvement. All three can successfully address needs from the personal, micro scale to the global, macro scale, yet each begins with strategic, level thinking about pressing needs and results in tactical, implementable change. Deliberately practicing wellbeing, creativity, and innovation contributes to deepening the understanding of self, shifting mindset and perceptions, building personal agency, developing new paths forward, and balancing between the states of being and doing. The relationship between creativity, innovation, and wellbeing goes far beyond parallels of intent, scope, and scale - it is symbiotic. The practice of creativity and innovation can actively foster the pursuit and achievement of wellbeing, while increasing wellbeing expands personal, organizational, and cultural capacity for creative function and innovation. These inspirational endeavors harness the energy, motivation, and connection that bring about authentic and valuable change. Identifying and understanding the ways in which wellbeing, creativity, and innovation practices support each other and fulfill our most fundamental human needs empowers our personal and social capacity for positive change throughout our lives.

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CHAPTER NINE

AURALISING THE SUBLIME: AN INVESTIGATION INTO CREATIVITY AND PROCESS IN THE PURSUIT OF SONIC PERFECTION

MICHAEL BROWN, DAVID PATERSON & CHRIS WILSON

ABSTRACT This paper investigates the creative process in the production of modern musical designs, from initial concepts through to process realization and explores the notions of expression, creative-wellbeing and closure. At what point in the creative process may a work of Art be considered complete? Is a modern creative artefact, especially digital, ever truly finished? The work considers compositional design and intent and to what extent creative direction and coherence are meaningful initial considerations; should creativity be burdened with consideration of outcomes at the outset? Technology and creativity are very often bound together in the contemporary creative process; how do we manage the process to ensure that we satisfy our aesthetic compass and promote a direction of travel to a satisfying sonic destination? Prevalent theories of creativity, tools and techniques will be investigated that can be utilised to provoke often unanticipated, but nevertheless, rewarding results. The exploratory use of digital audio manipulation tools and chance operations are considered alongside more determinate predictable processes in order to elucidate the role of the unforeseen in the production of creative content. The authors will document their own collaborative work and provide perspectives on artistic case studies from the world of education, visual arts and music. The work will promote the direct integrated teaching of creativity in music production and composition classes developing applicable tools that may help to stimulate original thought and address creative blocks, evaluating whether cognition of the creative mechanism offers positive stimulation in seeking creative solutions in the musical production process.

> *"Perfectionism is the voice of the oppressor, the enemy of the people. It will keep you cramped and insane your whole life… Perfectionism is a mean, frozen form of idealism, while messes are the artist's true friend. What people somehow (inadvertently, I'm sure) forgot to mention when we were children was that we need to make messes in order to find out who we are and why we are here…"* - Anne Lamott, from Bird by Bird (1980)

Keywords: creativity, music composition, post-production, constraint, project management

Introduction

The focus of this paper is upon creativity within the arts with particular emphasis upon music. The primary objective is to offer insights and to develop procedural strategies for application predominantly, although not necessarily exclusively, within higher-educational environments. The working practices of professional and educational creators will be considered to derive a series of conceptual and practical *tools* that may serve to facilitate a satisfactory and productive creative experience.

Two fundamental scenarios will be considered throughout the paper; the first will be the creation of new ideas investigating creative motivation, constraint, development and outcome. The second will consider the process of post-production within which pre-existing recorded materials are subject to creative arrangement, re-arrangement and processing. In both cases there are a multitude of potential outcomes with significant space to assert individual identity; fundamentally the product commercially will likely be the result of combined creative effort from inception of idea to final distribution artefact.

Drawing upon insights gained from creative colleagues and undergraduate teaching, the work will consider to what extent pre-considerations and expectations are factors in determining creative trajectory. The study will consider five primary attributes that will form the basis of the discussion:

- Education
- Definitions
- Creative Domain
- Creative Theory
- Creative Strategies

Genesis

Why would one be drawn to contemplate a creative act? There are a number of reasons that may be considered (see Figure 1), such as artistic need, desire or compulsion to communicate non-verbally; it may be for purely financial gain, an imminent assignment or perhaps there is an identified problem that requires a particularly individual solution; whatever the reason, without motivation there would be no creativity. Educationally all of the students encountered upon the author's programmes have already demonstrated a creative facility in the form of a portfolio of work:
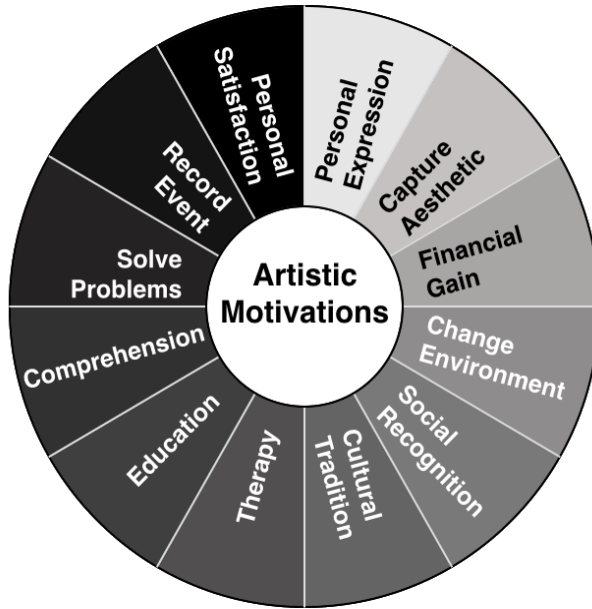
Figure 1 - Creative Motivations

To what extent does understanding the nature of creativity benefit the creative process? This question is at the heart of this paper. When all is well and the creative ideas are *flowing* then there may be little need for such introspection; perhaps there is even a reluctance for looking too closely at a fully functioning intuitive process for fear of derailing the productivity and tainting the *magic*, since the feeling of inspiration, of which artists often speak with reverence, can be perceived to be an *external* rather than *internal* mechanism; in times past the sense of a *Muse* bestowing creative wisdom was an alluring notion elevating the artist into a privileged position whilst at the same time relieving him/her of creative responsibility.

Understanding creativity, through reviewing significant artefacts or interrogating successful artists may very well offer significant insights into the conditions within which novel ideas arise, but can creativity be taught or at the very least enhanced? Creative subjects are invariably taught without any reference to creativity as an independent discipline. Students of music may be taught practical instrumental skills, developing performance repertoire, musical analysis engaging in exercises in harmony, counterpoint, arrangement, orchestration and various re-creative assignments, but the composer's creative strategies and the development of individual artistic expression (see Figure 2) are very often not directly addressed, particularly early on in the educational process. The development of a *sense-of-aesthetic* is to some extent left

to chance and personal style tends to develop out of repetitive habits and discovery.
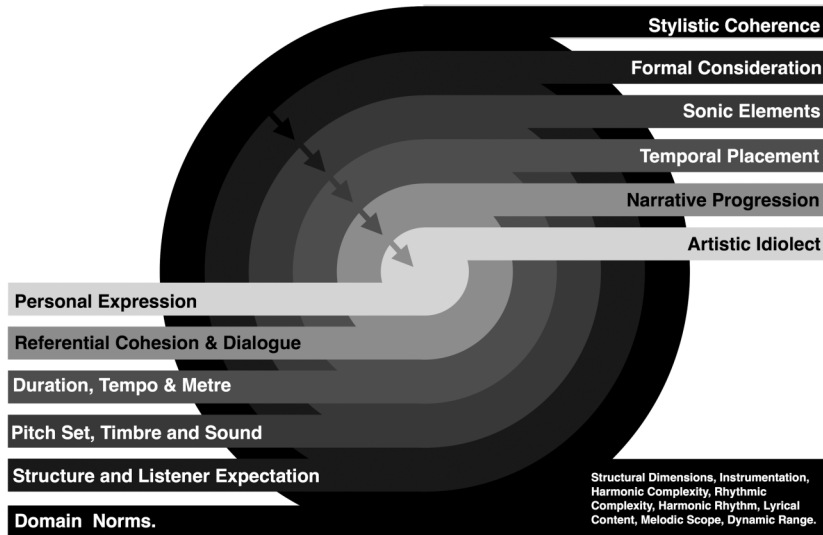

Stylistic Coherence
Formal Consideration
Sonic Elements
Temporal Placement
Narrative Progression
Artistic Idiolect

Personal Expression
Referential Cohesion & Dialogue
Duration, Tempo & Metre
Pitch Set, Timbre and Sound
Structure and Listener Expectation
Domain Norms.

Structural Dimensions, Instrumentation, Harmonic Complexity, Rhythmic Complexity, Harmonic Rhythm, Lyrical Content, Melodic Scope, Dynamic Range.

Figure 2 - Traditional Compositional Characteristics

Successful commercial music is not exclusively dependent upon the composer or performer abilities to produce new and marketable work; typically, it is a team of skilled musicians, producers, engineers and technicians who collaborate together to craft and refine the product.

This culture of creative teamwork began in the music industry as far back as *Tin Pan Alley* with its songwriters and publishers and is manifested within the design and use of early recording studios such as *Abbey Road* in the 1930's, which was one of the first purposely built commercial recording studio that employed teams of producers, songwriters and technicians.

The commercial creative process evolves through four stages that conceivably may overlap: 1. *Pre-composition* - may involve stylistic consideration or even calculations, 2. *Composition* - may be internalised idea or partially developed/improvised upon an instrument/s, 3. *Realisation* - The ideas are developed upon instruments, real or virtual, into a fully formed structure that is recorded, and 4. *Post-Production* - the performances are balanced, tuned, mixed and prepared for distribution. The hierarchical nature of the early *Abbey Road* recordings which generally involved songwriters creating the songs, producers guiding the performers and engineers operating the equipment, began to change in the 1960's as the recording equipment and mixing desks began to be used more creatively, sometimes as a result of fortuitous serendipitous behaviour.

Much of the innovating popular music produced in the 1960's was the product of experimentation utilising tape-loops and effects processing, informed by the avant-garde experimental classical traditions. During this time, the delineation of roles between producer, musician and technician became less clear; these roles are, to some extent, now interchangeable particularly with the advent of affordable home studio facilities and computer-generated instruments: Collaboration within commercial music production is still a significant feature feeding and maintaining the creative workflow.

Sawyer and DeZutter (2009) outline the importance of group creativity research, *"a wide range of empirical studies has revealed that significant creations are almost always the result of complex collaborations";* whereas the *significance* culturally, or otherwise, of commercial musical production might be debatable, the mechanisms of distributed creative practices are certainly worthy of investigation. Students of sound engineering, faced with creatively mixing multiple sound-files, may be taught (see Figure 3 below) the physics of sound, the mechanics sound editing/processing along with critical listening skills to allow the development of consistent perception and appropriate sound treatments.
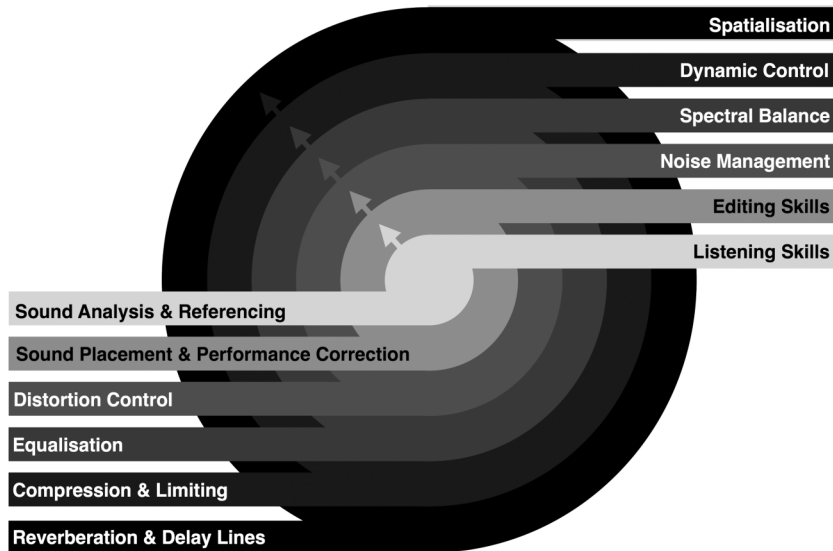

Figure 3 - Post-Production Characteristics

Common stylistic characteristics are absorbed through comparative studies of musical constructs and imitative exercises conforming to norms of behavioural expectation. A common activity would be the re-creation of classical recordings to determine the ideal behaviours and learn the available tools. In assessment, it is often easier to identify the errors in application, uncharacteristic deviations from the normal, rather than determine and validate individual

musical expressions that may be an indication of a particularly unique interpretation.

Missing in Action

Definitions can initially seem obvious but sometimes provide new insights and perspectives into creative activities and stimulate creative potential; this is where this study will begin and indeed where the authors both begin their respective classes in creative study to determine what is captured and what is missing from such definitions. What is Music?

Music is inherently a multi-sensory experience; we *hear* in space, we may *see* or associate in our imagination a causal source, we may *feel* objective resonance and create internal narratives to support emotional constructs, guided by expressed extra-musical identities. Given this, how should music be defined and what would be the benefit of such a definition? Perhaps to offer illuminating insight and provide meaningful constraints for creative focus? A typical dictionary definition offers: *the science or art of ordering tones or sounds in succession, in combination, and in temporal relationships to produce a composition having unity and continuity"* (Merriam-*Webster's Collegiate Dictionary*, online edition), which presents the obvious dominant characteristic and compositional preoccupation as naturally *sound*; regular patterns in which ideally result in listener coherence and sustained interest.

In a conventional sense, we might reasonably define music, in terms of this sonic attribute alone, as simply *'organised sound'*; the definition although seemingly superficial is satisfying since it is open and all-embracing of musical space, as was intended when Edgard Varése similarly expressed it (Goldman 1961, 133) when discussing his own aesthetic sensibilities in relation to his recent excursion into multi-speaker tape composition: Poème électronique (1957-58).

What is composition? A sonorous creative act, idea, performance or recording that might be considered new and valuable. To achieve value, this could involve be a transformation in an existing stylistic domain or the establishment of a new one that achieves cultural recognition. Alternative organisational designs in music we will call *style*, to mean the accepted *norms* of a musical period or individual. *Style* then in music refers to the common attributes and behaviours within a musical form; in any given *style*, certain features are considered normal and others anomalous. All sound may be considered *musical*, which is the virtue of the above definition, but in each culture musicians tend to admit only a subset of acceptable sounds, frequency arrangements, combinations and temporal patterns, into sonic expression.

There may be no single intercultural definition of music and the boundary between musical sounds and noise may be culturally blurred. Varése speculated (Goldman, 1961) upon the future of music *"the score of the future would need to be seismographic in order to illustrate their full potential"*, citing the definition of music given by Józef Maria Hoene-Wroński: "the cor-

porealization of the intelligence that is in sound", as being particularly influential in shaping his musical imagination.
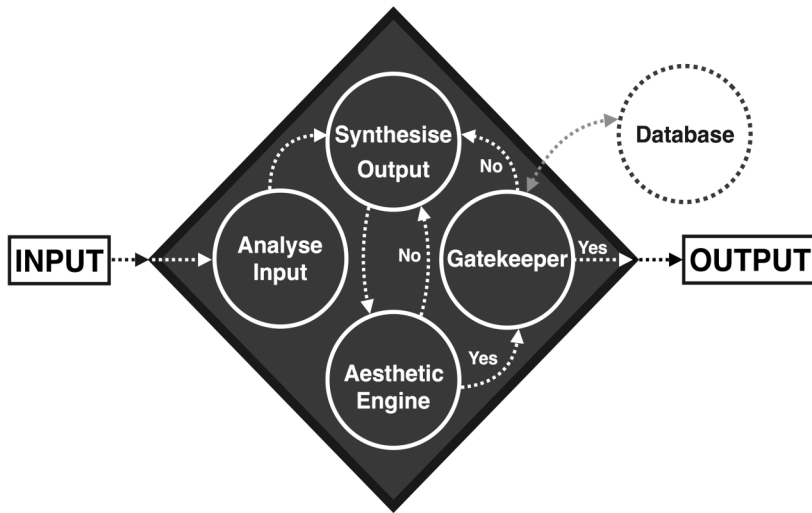

Figure 4 - Music Logic Machine

Music could dispassionately be regarded as an abstract sonic temporal construction, constrained by pre-formed elements organised in predefined relationships; a product perhaps more of *discovery* than invention, that might conceivably be determined or computed. Permutations and combinations of acceptable outcomes might be calculated and selected according to stochastic design (see Figure 4). From this perspective, mechanised musical culturally verified artefacts might be fabricated or synthesised according to audience requirements for expectation, consistency, coherence and originality.

Educationally it is not uncommon to study the *craft* of composition by learning the characteristics of archetypal work, through systematic analysis codifying behaviours tested through re-creation; creative motivation and method is somewhat less often addressed and there are other important peripheral attributes of musical expression and experience *missing* from the analysis, that may offer new perspectives and valuable insights such as:

- The creative process: which is very likely non-linear; does music have to be experienced along a fixed timeline?
- The communication and expression of emotive design through dynamic physiological gestures in performance; music has at times been considered a language with linguistic syntactical structure (see Bernstein, 1990). The imprecision within the symbolic representation (notation) is also profitable for performers, allowing for expressive individual interpretation.

- The tactile sensations of performing/composing upon instrument, sensing and responding to the resonant vibrations within a space. Each performer has individual muscle memories and patterns of behaviour that may be meaningfully codified outside of sound.

If we could transform and translate our perspectives, music might be qualified in other ways; Varése experienced such an epiphany (expressed in the Lewiston Daily Sun, 1936) when listening to a Beethoven symphony: *"I became conscious of an entirely new effect produced by this familiar music. I seemed to feel the music detaching itself and projecting itself in space. I became conscious of a third dimension in the music"*.

Novelty and Coherence

In order to be creative, it is clearly important to understand to creative domain within which creativity is to take place. Given the self-imposed limitations, music remains a system of sufficient complexity to allow for combinatory and sequential variation accommodating novelty, identity and meaning. According to Csikszentmihalyi (1996), a creative artefact requires a context within which it is created and reviewed (see Figure 5). The artist learns the *rules* of the creative domain, ensuring audience coherence, and then arranges the elements in new ways maintaining artistic consistency.

The completed artefact is then offered to the *gatekeepers* to verify its validity and uniqueness to be added to the domain database. Innovation in music however, requires more than mere *novelty*; the newness must have a context for it to be validated by the domain gatekeepers, as Frank Zappa said (Zappa, 1989): "Without deviation (from the norm), 'progress' is not possible…In order for one to *deviate successfully*, one has to have at least a passing acquaintance with whatever *norm* one expects to deviate from". Does understanding the creative process make creativity more or less likely? If it can be accepted that creativity is indeed a process, a way of operating, then it is conceivable that it can be learned or enhanced as a skill.

As a fundamental component of undergraduate studies within creative subjects the authors have integrated sessions upon *creativity* as a particular discipline into all levels of creative academic engagement; the objective is to introduce the notion that attending to creative thought processes could be profitable in seeking a solution to a presented problem, which is frequently defined as an assignment brief in the form of a commercial commission. A common assignment brief would be to compose or post-produce music according to given stylistic constraints to satisfy a particular function.
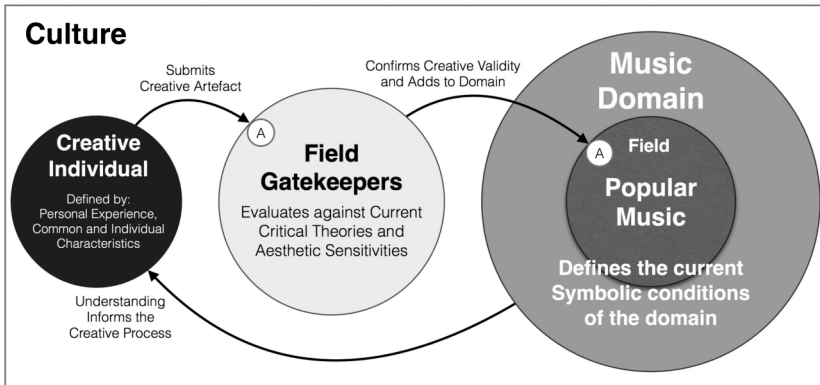
Figure 5 - The Creative Domain, adapted from Csikszentmihalyi (1996)

Many of students frequently encountered have already demonstrated a capacity for producing creative work on some level, so a part of the study is to identify creative traits and behaviours that may already form a part of their individual identities (see Figure 6). Behaviours that are regarded as profitable may also be adopted those that are not can perhaps be reduced. The challenge is to express the creative process in a directly applicable form or translate prevalent theories in ways that are meaningfully applicable.
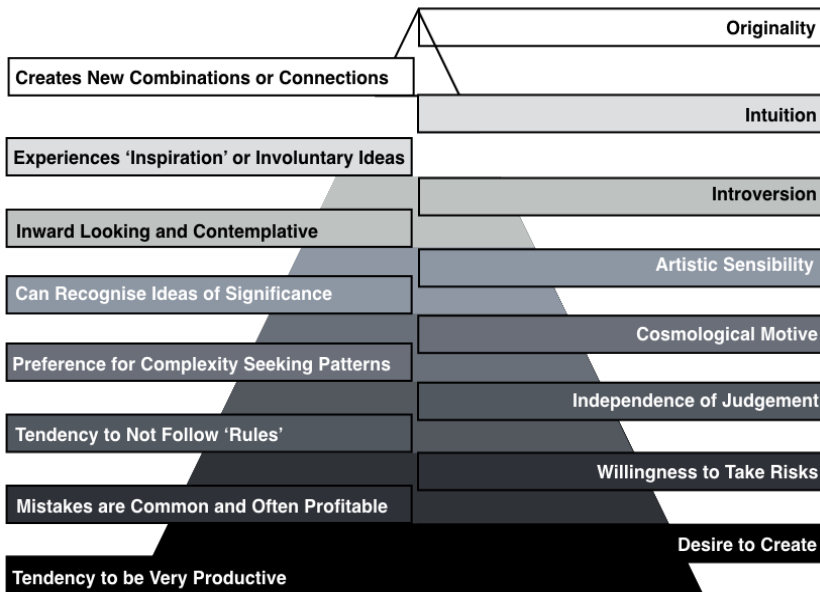
Figure 6 - Creative Characteristics, adapted from Barron (1969) and Guildford (1988)

What is actually meant by creativity in this context? From a compositional perspective, the objective is to produce new music; for post-production, the outcome should be a unique mix of sounds; both products however are required to be functional. Newness and uniqueness are not objectives to be pursued in preference to coherence. Absolute novelty as a creative objective is not to be considered a beneficial trait in an environment in which listener comprehensibility is paramount.

Performer identity and self-expression are only meaningful if the artist has consistent, repeatable, traits that are different enough from other artists to be desirable but similar enough to be familiar. These behaviours can prosper in systems that have sufficient complexity to allow multiple solutions but with enough syntactical structure to allow coherence. How does the artist know that something original with value has been produced that also satisfies the need for comprehensibility?

Fundamentally coherence is determined through comparisons with other like products; this may receive a validation of authenticity from an audience or a search approval from a database. In the case of composition this is particularly relevant to be certain that there are no copyright infringements.
Composition and the post-production process involve to a large extent the selection and arrangement of known elements in acceptable ways; what is *acceptable* is largely governed by convention and experience. What is also sought as a part of the process is the accommodation of significant but *attractive* differences in interpretation representing the identity of the creative individual.

An original idea needs then to satisfy the requirements of the stylistic domain (see Figure 7), appeal to the listeners and pass the scrutiny of the gatekeepers. Expert creators have a tendency for overly complex solutions, that make use of years of experience and knowledge, often overlooking the simpler solutions that might be more accessible to the novice creator. A common strategy for the *expert creator* is to induce a more naive perspective of the domain through the use of self-imposed constraints as expressed by Stravinsky (1942) *"... my freedom will be so much the greater and more meaningful the more narrowly I limit my field of action and the more I surround myself with obstacles.....The more constraints one imposes, the more one frees one's self of the chains that shackle the spirit."*

A perennial anxiety is where to begin? Assuming *inspiration* (however this is defined) is not forthcoming and the outcome of the creative act is governed by particular imperatives, as is common within education or the commercial world, how is the creative process invoked and maintained? Even with ordinarily self-assured individuals there may be periods of creative block where there is a sense of expressive paralysis because the projection of imagined *perfection*. This experience is particularly resonant for students about to embark upon a significant piece of assessment that will ultimately be subject to a critical review. If the outcome has assumed an exaggerated importance in the mind of the potential creator then fear of doing the wrong thing and at-

tracting a negative response, or fostering a focus upon an idealised outcome or even an idealised response to an imagined outcome before the first step has been made can prove ultimately inhibiting; as American composer Aaron Copland (1959) expressed it as follows: "There is the fear of being wrong, plus the insecurity of not being able to prove that one is right, even to one-self". How might one circumnavigate the experience of creative block? Frank Zappa (1989) was typically dismissive of qualitative responsibility when offering advice for prospective composers:

> *Just Follow These Simple Instructions:*
> *1. Declare your **intention** to create a "composition."*
> *2. **Start** a piece at **some time**.*
> *3. Cause **something to happen over a period of time** (it doesn't matter what happens in your "time hole"—we have critics to tell us whether it is any good or not, so we won't worry about that part).*
> *4. **End the piece at some time** (or keep it going, telling the audience it is a "work in progress").*
> *5. Get a part-time job so you can continue to do stuff like this.*

Joly in (Guildford 1977) suggests that two parallel thought processes have to occur to achieve creativity. The first process being a psychological one of overcoming inhibitions such as existential anxiety or the personal hindrance of lacking confidence, and the logical application of well-defined action processes by following intuitions based on carefully chosen techniques and methods adapted to a specific scenario.

Creative Theories

An integral component of music classes are incorporated sessions on creative thinking. Classic domain-general models of the creative process such as by Wallas (1926), Koestler (1964), Guilford (1967), Baron (1969) and Sternberg (1999) are discussed to raise awareness of potential common creative mechanisms and a consideration as to how this knowledge might be applicable in specific disciplines.

Figure 7 - A Creative Process, adapted from Wallas (1926) and Young (1965)

The fundamental objective in this undertaking is to offer meaningful and applicable insights into the creative process and consequently encourage the student to take greater control over their personal creative activities. It is not difficult to imagine how one might apply the above model (see Figure 7) to music production. 1. *Preparation* - Listen to music stylistically focussed and widely diverse; also read widely and take notes, 2. *Exploration* - consider how the various music, ideas might be related, 3. *Incubation* - Do something unconnected and try not to focus upon work, 4. *Illumination* - record the ideas and 5. *Verification* - review and evaluate ideas.

What is difficult is to guarantee a result or to predict a realisable timeline for the advent of the *illumination* stage. Bruner (1962) states that the sensation of illumination is often perceived as a combinatorial surprise: *"An act that produces effective surprise is the hallmark of the creative enterprise."* He defines three ways in which surprise might be revealed: Predictive, Formal and Metaphorical; Predictive is the application of experience in an established creative field; the surprise in this case may be only appreciated in reflection. Formal is a result of a discovery within a field in which combinations previously considered unconnected now appear to be so. Metaphorical is when connections are made between two different fields of activity but produce a satisfying and unexpected union.

The objective of these sessions is to offer provocations into creative process but the extent to which *domain-general* theories can have a meaningful impact upon the productivity and successes of a specific set of creatives is uncertain (Baer, 2012); nevertheless, the sessions are generally very well received and do promote very positive discussions of productive attitudes and practices although, tests of creative potential (Kim, 2006) rarely yield any meaningful insights into the creative musical potential. A common initial conception that arises out of student discourse is that creative states of mind are inaccessible without some form of inspirational intervention and as such the study of creativity may not be directly beneficial; this perspective for some results in potentially redundant timetabled laboratory sessions within which the creative artefacts that are requested are not immediately forthcoming. This is compounded by the observation that much research into creativity is often preoccupied with the study of examples that transcend the boundaries of the domain, whereas musicians generally wish to refine that which defines creative identity which depends to a large extent upon repetition of behaviours. It is interesting to note that when students are invited to share personal work that is regarded as fundamentally a result of inspiration, no examples offered have ever been realised without a stylistic context. All work was stylistically framed by experiential conditions within a familiar domain. As observed by David Byrne (2012) *"I had an extremely slow-dawning insight about creation. That insight is that context largely determines what is written, painted, sculpted, sung, or performed"*.

Revelations

When student composers are left to *create* according to their own designs and motivations, what often results are creative reinventions that are to a large extent demonstrations of skill and a statement of social identity. Familiar workflow is invoked utilising tried and tested patterns, timbres and harmonies within comfortable software or environments that have resulted in past successes, either commercially or academically. Why would one not resort to experiential skills and knowledge that has been developed perhaps over a number of years? is it not their right to make use of the very characteristics that define their individual expressions? Sometimes this expression is irrevocably associated with physical gestures upon a musical instrument or particular piece of equipment as a result of potentially many years of learning technique and repertoire (or patterns of behaviour). Creative decisions are made then according to a sense of aesthetic confirmation, producing work to suit known stylistic designs that will achieve a satisfactory outcome. The work is constrained to a great extent by expectation and imagination which are both governed by experience; creativity in this case would likely involve variation within the boundaries of stylistic consistency. Meaningful variation is commonly achieved through *inspiration* (involuntary ideas steered by musical intuition that arrive in the mind of the creator), or through improvisational, sometimes collaborative, chance discoveries.   There may be of course be many different levels of creative achievement that will either correspond or transcend stylistic boundaries. Irrespective of the motivational reasons or processes of creative discovery it is common for outcomes to be governed by limitations or constraints of design inherent in the expression.

Musical and production limitations may be educationally designed to similarly increase focus, relieve anxiety and to some extent creative responsibility as to where to begin in a compositional task; failure then is not so inhibiting nor is closure as the exercises can be time limited:

- Limited number of instruments or tracks
- Limited instruments or tools
- Collaborative working
- Partial solutions offered
- Fusion of Styles
- Complete freedom in one dimension but constraint in another

The word 'constraint' in this context is not intended to be negative. When complete freedom is offered in an assignment, students seem naturally inclined to repeat past successes through operational conditioning. The exercises are designed to render re-creation is less likely and creativity a consequence. As a result, the student is forced to solve a problem using unfamiliar criteria that may inevitably result in novelty, at least from the perspective of

the student, and may reveal some hitherto unknown characteristic of the subject or process. There are generally six outcomes from implementing such constrained exercises:

- *Compliance 1* - accept limitation and develop novelty within constraint
- *Compliance 2* - try to recreate within constraints. Find the familiar within
- *Compliance 3* - but with *negotiation*; student accepts limitation up to a point then negotiates additions or inclusions which may include multimodal considerations
- *Negotiation* of new boundary conditions at the outset - testing the constraints
- *Inactivity* - demotivation and frustration
- *Complete non-compliance...* Disregard or oppose guidance

The objective is to provoke the student into an exploratory mode within which they may discover new perspectives that stimulate creative ideas. New ideas for the student may be assimilated in a number of ways: 1. *Substitution* - where an old practice element is replaced, 2. *Incorporation* - where the new practice is added, 3. *Redefinition* - where the whole creative approach is reconsidered as a result of the new ideas, and 4. *Development* - where the student takes the new ideas and develops them even further. Not all students benefit, some find it ultimately easier to reject the new ideas and revert to older more successful practices.

The Beatles and George Martin created unique recordings by using a very limited palette of effects to manipulate recorded sounds and primarily used audio tape to achieve it. They would speed up recordings or layer multiple overdubs stacked to create a fuller sound and also explored new processes to manipulate and enhance the recorded sound, such as phasing, flanging, ADT (auto double tracking). It is clear from various interviews given by Martin, that they felt liberated by the freedom that tape-based manipulation effects had given them but, in fact, they were operating within a walled garden because of the inherent limitations of the technology. Is that the paradox of creativity, the illusion of freedom within a cage? Stokes (2005) recognised that masters of their domain only become creators when they impose novel constraints on their output; she suggested that progress can be made in a project by augmenting and developing the positive features whilst simultaneously diminishing the negative.

Figure 8 - Aesthetic Dialogue, adapted from Stokes (2005)

One of the greatest inhibitors to creative output in a modern recording environment is perhaps having no technical constraints. As Goldbeck (1949) expressed it: "The composer's chords are every dead or living composer's chords, never his own. His paper is never a blank, there are so many staves on it, five prison bars in each, History and Tradition being the jail…". It is very often more productive in modern recording environment to agree the constraints on the product at the beginning of any project. The setting of boundaries reduces the time taken to experiment in unproductive ways and leads to more cohesion of thought between producer, engineer and artists. From personal experience of the authors, the idea of recording a wide variety of random ideas and then evaluating their impact on creative output without any agreed constraints leads to frustration amongst the production team. There are many stories of artists spending thousands of pounds and significant recording studio time experimenting, attempting to find the perfect combination of musicians, instruments and phrases that would make their recording complete only to find the exponential complexity of such a task overwhelming. Constraints provide some linearity to the creative process in the recording studio and having clearly shared ideals can also promote collaborative creativity amongst the production team.

How do we know when a worthwhile discovery has been made? How do we know which strands of investigation to develop and which to discard? Is it possible to evaluate the potential of success early on in the creative process? Is the creative instigator the best person to make this judgement and at what point should the judgement be made, if at all? Educator and artist *Sister Corita Kent* was clear to differentiate between creativity and critique within *Some Rules for Students and Teachers,* a list established as a part of a project she taught in 1967-1968 at LA's Immaculate Heart Convent college:

Rule 8: Don't try to create and analyse at the same time. They're different processes.

Leonard Cohen (quoted in Zollo. 2003) poetically expresses his perspective upon making a creative evaluation too soon in the process: *"The cutting of the gem has to be finished before you can see whether it shines."* This idea of idea generation and evaluation being separate and distinct processes in creativity has been defined by Osborn (1993) during 'brainstorming'. This technique can be applied to the music production process. Idea generation should be confined to the recording stage and evaluation of ideas during the mixing or post production stage. In an educational environment, although the idea of adopting these techniques for music creation can feel to students as inhibitor to inspiration, the opposite has occurred. In practice, the authors have found that by adopting these techniques during recording sessions, it encourages group creativity and reduces creative anxiety amongst students who feel that due to their perceived lack of ability cannot be in any way be creative as they feel they can contribute at least partly to a musical product.

How do we know when a work of art is complete? It may be, as often is the case, that the deadline arrives as Pixar animator, director and producer Pete Docter said (see Usher, S.,2010) when quoting colleague John Lasseter: "Our films don't get finished, they just get released." Deadlines can be very useful devices that may be also internally administered since it can be difficult, especially if working within digital media to declare a work complete. Time and money constraints can be very meaningful motivators to complete work but artistically is the work ever finished? Music producers Müller and Wyner (2017) extol the virtue of taking breaks stating, *"Fatigue is the enemy of objectivity"* and suggest seeking the opinion of qualified others. *"If I can't make something better, don't do anything"* says Wyner, without qualifying what *better* actually means, but suggesting not that the product may be *perfect* but has evolved as far as possible within the constraints of equipment, his skill-set and/or musical ability within the performance.

In the recording studio environment, it is important to separate the processes of recording and mixing (post production) and to have a break in between as this can aid objectivity during mixing. It is very common for creators of music to become so involved in their project that they find it difficult hear it as someone who has not heard the music for the first time. Their focus is often skewed towards areas that required the greatest amount of skill or exertion on their part rather than the overall experience that melody, instrumentation, phrasing and production creates in the listener.

In post-production, a technique that draws on the necessities of time constraints, the need to remain objective in mixing decisions and the desire to produce the best work possible can be adopted. During the mixing stage, there will be many passages in the music that can be identified to need adjustment such as balance of instruments, depth of the soundfield or how close or distant an instrument may seem and the listeners focus at any one point in the musical passage.

It is important that after a significant break between the recording process and the mixing stage, on first listen, the production team creates a list

of immediate and obvious adjustments that are required. This first listen will be the most objective and closest on how the production will be heard by a listener unfamiliar with the work. When working through the list of adjustments, other problems may be identified however they should be evaluated on overall improvement to the listening experience and the constraints of time. Once the adjustments have been made and list has been exhausted, the mix can be considered as complete as possible in that time frame.

There may be for some advantages in a work never being completed as hinted at by Yoko Ono (see Richardson, 2007): *"I always believed that my work should be unfinished in the sense that I encourage people to add their creativity to it, either conceptually or physically."* The acceptance of a never completed work is a characteristic that is useful as it does not inhibit the creation of new work. Understanding that a work is the best it can be whilst working to constraints moves the focus back to new idea generation of new material.

Conclusion

Artists may wish to consider their work a free and individual expression unfettered by audience expectation or priori considerations; this is for some a significant motivator; artists are inspired by great works and successful creative minds of the past, but ultimately seek to express a personal, unique and resonant message. To what extent are artists bound by prior structural conditions? expressive, technical or otherwise and is there any virtue in raising awareness of these features? How does one learn to create art? It is not uncommon for students to validate their creative ideas by asserting its expressive credentials or declaring it as a product of the free imagination; but products of inspiration are invariably never outside the domain with which the artist is associated. There may be aspirational ideals that steer the expressive voice to explore more remote domains but to what extent may the product regarded as *authentic*.

Within artistic educational institutions students are indoctrinated through studying the work of past masters, to develop technique and absorb philosophies; this is initially achieved through, environmental exposure, structured observing/listening and technical imitation, encouraging the students to secure identity and ownership in the pursuit of increasingly idiosyncratic approaches developing a personal expressive voice. How does this work in practical terms? It may involve, in particularly enlightened institutions, the consideration of the creative space within which play and experimentation is encouraged. Csikszentmihalyi (1996) states that *"it is easier to enhance creativity by changing conditions in the environment than by trying to make people think more creatively"*, nevertheless creativity is a process, a way of thinking than can be enhanced through the adoption of certain identified behaviours, and awareness of the mechanisms of creativity may ultimately diminish the inhibitors to it. Csikszentmihalyi (1996) also states that

"genuine creative accomplishment is almost never the result of a sudden insight, a light-bulb flashing on in the dark, but come after years of hard work".

The authors have attempted to heighten awareness within the undergraduate population of the creative process and its mechanisms, to produce a model (see Figure 9) of its operations that invoke a series of practical and applicable strategies. The fundamental model is threefold involving: 1. *Inspiration* - where the creative process (see Figure 7) is activated, 2. *Exploration* where the student accesses a toolkit containing a series of provocations and 3. *Experimentation* - where the student is encouraged to invite *extra-musical* features into the process. Throughout the process the students are encouraged to reference the outcome aesthetically developing a sense of what is stylistically appropriate.
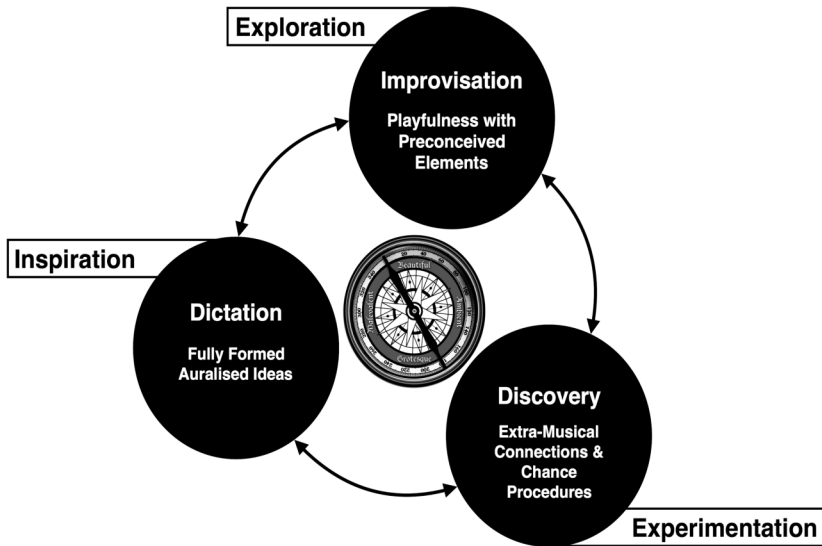

Figure 9 - Aesthetic Compass

It may be too soon to evaluate whether such lessons in creativity will have a meaningful and lasting impact upon the futures of undergraduate students in music and music production, but the lessons are very well received and the students report the benefits of the activity; the work will continue.

"It may be that when we no longer know what to do,
we have come to our real work,
and when we no longer know which way to go,
we have begun our real journey.
The mind that is not baffled is not employed.

The impeded stream is the one that sings."
"The Real Work" by Wendell Berry, from Standing by Words. ©1983

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CHAPTER TEN

HOW TO DEVELOP CREATIVE CAPACITY FOR THE FOURTH INDUSTRIALREVOLUTION: CREATIVITY AND EMPLOYABILITY IN HIGHER EDUCATION

CHRIS WILSON, PETER LENNOX, MICHAEL BROWN & GARETH HUGHES

ABSTRACT With changing patterns of accountability in higher education, universities are becoming increasingly focused on performing well against a growing number of metrics. Many used as proxy measures to indicate value of educational experience, amongst the most common and perhaps most notable are those relating to graduate career destinations. Universities have never been more focused on ensuring that graduates are 'employable'. In the midst of the fourth industrial revolution, numerous studies highlight the potential significance and value of creativity, problem-solving and critical thinking, for successful navigation of the complexities of the future. Consequently, these capacities are becoming more significant in determining graduate career development and educational strategy in higher education. This chapter presents a synthesis of related fields of research to construct an outline framework for the development of organizational creativity and creative graduates concluding that there are aspects of current pedagogical practice capable of worthwhile reform.

Keywords: creativity, employability, strategy, future.

Introduction

This chapter explores the future of higher education and considers the implications of change for educational strategy. There is a palpable sense of pessimism and uncertainty in most reasonable projections about the future. Presented as though an increasingly unstable entity, the wider discourse reflects a

trompe-l'œil of sharply contrasting, but also paradoxical, promise and ominous risk in economic, environmental, geopolitical and industrial terms.

The world is moving rapidly into what is widely described as the fourth industrial revolution. Beyond mere continued mechanisation, the rise of robotics, machine learning, and AI, are beginning to fundamentally transform human experience and collective human endeavour. Imagined in quite positive terms by many, Professor Klauss Schwab (2017), Founder and Executive of the World Economic Forum, for example, highlights the significance of connectivity and potential for regeneration of natural environments and increased industrial efficiency through more effective collaboration. Others, including Harari (2014) note the increased rate at which jobs are being replaced by automated systems, and highlight the potential for a wave of industrial employment disruption synonymous with the 19th century, foreseeing divergent potential for either a god-like future for humanity, or a collapse in the need for a significant amount of current human expertise and endeavour (Harari, 2017)'. A potential future of human redundancy.

The possibility for there being a 'last job on earth' as a utopian ideal of a human future of leisure and creative endeavour has been explored in the literature extensively. However, the stark reality of the lights going out in offices and factories presents at least pause for thought in terms of the transitional process, whatever the 'other side' of this momentous change were to become. Grace et al. (2017) made predictions based upon a large-scale survey of opinions from machine-learning researchers to conclude that technology may outperform humans in many activities over the next ten years with a *"50% chance of AI outperforming humans in all tasks in 45 years and of automating all human jobs in 120 years"*.

Whilst technology is undoubtedly leading to the development of new employment roles, more redundancies in the workforce are inevitable for many (Susskind & Susskind, 2017), with entire professions likely to be absorbed by technology in rapid order. This might be the first technological revolution in which there is a net reduction in opportunities for human endeavour and application, and a commensurate and rapid decline in overall employment. Whilst this process is arguably an acceleration of industrial changes already centuries underway, the pace has, however, changed fundamentally. At some point in the near future, machine intelligence will overtake human intelligence and, potentially, machine creativity will eclipse biological creativity. Entire socioeconomic, never mind educational, models may require fundamental reconsideration.

The term 'technological singularity', initially denoting the technological end of humanity, was first attributed to Stanislaw Ulam in his 1958 obituary for John von Neumann. Later adapted by author Vernor Vinge (1993) to denote more specifically the point at which artificial intelligence exceeds the sum total of biological intelligence, the full consequences of which he identified as being as uncertain as the properties of physics beyond the event horizon of a black hole. Simply speaking, AI is seemingly inevitable, and the consequences are unforeseeable. Unlike perhaps other technological innovations, it is vanishingly unlikely that its significance is either being over played. After all, *"the ability to innovate, to generate novel behaviour, to invent new things or devise new ways to use old things"* is already a well-established machine behaviour (Shanahan, 2015: 7). This is not an abstract concern for the future, this is now.

In addition to the complexities of technological opportunities and uncertainties are of course are many and varied natural and very certain immediate challenges. From protection of the environment to the realisation of human equality and wellbeing, the list of aspects of human existence requiring new ideas is long and growing. With a specific focus on the development of creativity and related pedagogic practice, the paper explores the role of universities in developing the knowledge and skills necessary to meet the future needs of society and presents a critical analysis of related discourse and research. Facing a future of such apparent uncertainty, promise and risk, the question is quite simply how should education, and higher education specifically, respond to these dynamics and adjust strategic and pedagogic approaches? Artificial intelligence and machine learning alone provide cause for serious epistemological questions about the future of education, their implications challenging the fundamental basis of our understanding of what it means to be 'knowledgeable' or valuably 'skilled'. The very purpose of education itself is seemingly up for grabs. As posed by Susskind and Susskind in their analysis of the Future of the Professions, "What work will tomorrow's professionals do, and what are we training them to become?" (2015: 232).

What does the future need?

From an educational perspective, compared to current graduate capabilities, the future needs of society will require either:
  A. Fundamentally the same intellectual and practical skill set
  B. A subtly different skill set
  C. An alternative or profoundly adjusted skill set

Given the dynamism and short period of time between the third and fourth industrial revolutions, and increasing sophistication by which business and industry are operated in synergy with new technologies, considerable expertise and energy is brought to bear in determining projections of future needs. Numerous organisations publish detailed reports and analyses on an increasingly regular basis outlining projections for the future so as to underpin effective and stable business operations and develop strategy for prosperity and sustainability. Whilst there is some notable variation in thinking evident between different reports, none reach the conclusion that A (above) is likely. There may be some variation of perspective of the focus regarding B) and C), but there is consistency in considering A) as a potential risk if change is not made, and that educational systems simply seeking to enhance existing approaches with a focus on the same outcomes could leave students at a personal and professional disadvantage.

Receiving significant attention in the international media, The World Economic Forum's (WEF) *Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution* published in 2016, projects the following top ten skills for employment by 2020:

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

Noting that 1 and 2 are subsets of 3, that 4-10 either benefit from creative approaches or are facets of creative thinking, and that creativity itself has risen in WEF's own estimation from their previous projections, the priorities would seem to align with scenario B in the introduction to this section. Others, including Williams (2016) are more explicit in making the case for the need for more profound change arguing that "educational institutions at the primary, secondary, and post-secondary levels, must realize that their current structures are largely the products of technology infrastructure and social circumstances of the past." Also making the case for increasing significance of people skills and social intelligence, Williams, whilst not highlighting cre-

ativity in specific terms, nevertheless identifies 'Novel and adaptive thinking', 'Cross-cultural competency', 'Transdisciplinarity' as well as 'Resilience' and wider team skills as being of increasing importance.

Common to all detailed future projections is an acknowledgement of the increasing significance and transformational impact of technology. Davies et al (2011) focus on 'Computational thinking' 'New-media literacy' and 'Virtual collaboration' as being of increasing significance, whilst Campbell's UK Government Office for Science report (2016) highlights 'Technological growth and expansion' and increasing related significance of 'Interconnectivity and collaboration' in developing the '4th generation workplace'. In common with many surveys projecting future needs, Störmer et al 2014 report for the UK Commission for Employment and Skills also identifies technological skills in broad terms as being of significance, and specifically key skills combinations and interdisciplinarity. For example, the emergence of 3D printing is highlighted specifically as one context in which technical and design skills may require new approaches to combined subjects and educational study.

Whilst there is consistency across nearly all detailed projections of the future of jobs and skills needs regarding technology in general terms, reflecting the uncertainties of an increasingly technological future, terminology shifts and changes on a rapid basis. Many still refer to 'ICT' (Information and Communication Technology) at a time when this is becoming less widely used as a term, whilst AR (Augmented Reality) is only recently being subject to focused consideration and more widespread adoption.

Such is the pace of change driven and facilitated by technology, the significance of new tools is seemingly possible to identify before specific implications are knowable. Nevertheless, all reasonable projections of the future identify space fundamentally transformed by technology, which in reality means both the augmentation of some aspects of human activity and capacity and the potential redundancy of others. For some this is simply the stark reality in which "Human professionals will have to come to terms with the need to defer to the superior capabilities of machines" (Susskind & Susskind, 2015: 117). Starkly, one of many possible futures is even one in which human creativity is no longer required for the purposes either of human survival or flourishing.

Whatever the needs of future skills mix and human capability, and recognising the subtle but occasionally significant variations in projections and interpretations, there is consistency at least in most analyses that the future is very different from the futures of the past. Unlike previous eras during which

'progress' was more actively driven and controlled, there is a prevailing sense to which the genie is very much out of the bottle and that not only unpredictable, the future is also something to be prepared for more than shaped.

This apparent pessimism or defeatism perhaps explains the reason for increasing focus on critical thinking and problem solving; not so much attributes necessary for tackling specific human challenges, but skillsets necessary for navigating complexity and uncertainty in and of themselves. We will have to be more creative as we cannot be certain what the nature of the challenges will be, but paradoxically, we can at least be clear that amongst these will be the need, it seems, to deal with new complexities of our own making.

The problem of creativity and employability in higher education

There are recognized tensions and incongruities between the structures and processes of university and the conditions experienced by graduates in employment. To a great extent this is nothing new. Whilst universities have increasingly become more business focused and absorbed many aspects of operational procedure common to the corporate and industrial sectors over time, higher education has, nevertheless, maintained a distinctive academic tradition. Whilst there may be more direct parallels between the cloistered tradition of an Oxbridge education and the archaic heritage of political life in older democracies, most students leave university and move out of academia into profoundly different patterns of work and professional lives.

It is important to confront projections of the nature of future challenges critically and seriously, especially given acknowledged uncertainties and apparent need for dramatic changes to educational strategies and objectives. Given the apparent consensus of an ever more technological and integrated future and simultaneous doubts about the sustainability of the very industrial and economic infrastructure maintaining this future framework, higher education stands at a significant juncture, tasked with adjusting approaches to meet different needs for an uncertain future.

Resistance within the academic community to large parts of the employability agenda has to a great extent given way to increased collaboration between HEIs and industry (Tran, 2016), and led to a shifting of the traditional emphasis on academic determination of student needs towards a mixed model driven both by subject discipline and external context, with increased involvement of specialist employability support services. Driven in part by an increasing accountability of universities for the success of graduates in the labour market, and by a clear indication of a current discrepancy between the knowledge and skills developed through university study and the capabilities

required in the workforce (Oliveri & Markle, 2017; Adecco, 2017; OECD, 2016; Green & Henseke, 2016; Cuschieri, 2016; CIPD, 2015; UUKb, 2015; Nagarajan & Edwards, 2015; WEF, 2014), employability metrics used as proxy measures of teaching quality nevertheless remain widely considered as "clumsy and contentious" (Rich, 2015) with continued uncertainty as to whether employability is developed most effectively through a discipline, in combination with other activities, or as an adjunct activity to disciplinary study; almost everything except the discipline itself.

Recognising that most employability measures, including the current DLHE (Destination of Learners from Higher Education) survey in the UK, measure employment rather than employability, and given the numerous factors determining speed of appointment into a 'graduate level' job being both nebulous and imprecise and most certainly beyond the reach of universities to influence in part never mind fully, outcomes-based metrics of employability have been subject to critique for many years (Harvey, 2001; Knight & Yorke, 2003). How quickly a university graduate gains employment in a role or how much they earn, with their qualification as an essential requirement, is an obviously ineffective measure of employability for many reasons. Taking no account of economic or personal context, there are many reasons why university graduates may choose to take their time determining their next step, especially given that a considerable proportion that find themselves with opportunity to consider their choices more openly, out of education, than at any point in their lives. And, given the speed with which the employment landscape is changing and is projected to change, simple focus on the level of pay received by graduates also falls short of reflecting employability in a meaningful way. After all, given the internationalisation of higher education, graduates with notionally equivalent 'employability' may move into very different employment contexts and face very different opportunities on completion of their studies.

A key issue is that of the conception of employability itself with a recognised disparity between student and employer understanding of what this means in practice (Tibby, 2012). Beyond a general consensus of the value of 'relational skills' such as communication and teamwork, there remains little apparent consensus regarding precisely which skills combinations or attributes determine 'employability', but clear evidence from graduate employers of a gap to close in terms of preparedness (Suleman, 2016; Oliveri & Markle, 2017). Surveys of graduates and graduate employers indicate continued focus on skills and competencies, followed closely by relevant work experience, qualification type and subject (UUK, 2016) as being the key factors determin-

ing employability, with degree classification and completion of a formal placement activity judged to be of lesser importance.

Recognising the need for more sophisticated and holistic measures, 'LEO' (Longitudinal Educational Outcomes), in the context of the Teaching Excellence Framework (TEF) in the UK in particular, promise a more balanced and effective measure of overall educational impact. Modelling of established data demonstrates that overall employment or further study "vary little by subject" (DfE, 2016) but a subtler and context specific interpretation will undoubtedly be developed. In an era of increasingly sophisticated data analytics, the employability and impact of university graduates will undoubtedly be subject to increasingly nuanced and open analysis, but for the time being, measures are crude at best.

Assumptions that subject discipline related graduate employment denotes a greater success than a non-subject discipline related role are challengeable, particularly given the expectation of rapid reduction in long term career positions and increasingly dynamic labour market and careers landscape. Equally, we would argue that a graduate that adapts knowledge and skills developed in one domain and successfully translates these into other professional situations has demonstrated considerable creativity and adaptability.

The systems dynamics challenge: creativity in education

An increasing focus on creativity in education has been evident for several decades as has a growing awareness of the tensions between educational systems and the development or realisation of personal creativity. There being general consistency and commonality in student perceptions of barriers to creativity in higher education, whilst student awareness of creative opportunities has undoubtedly grown (Power, 2015), there remains a clear tension between creativity and formalized testing (Hillal et al, 2013) in particular, with key factors such as personal inhibition (shyness), lack of motivation, time and opportunity, and aspects of social repression (Morais et al, 2014) compromising effective realisation of creativity in formal educational contexts.

Paul Kleiman (2011) perhaps expresses the educational dilemma most succinctly with reference to creativity operating on the "edge of chaos", whilst certainty and consensus inevitably pull educational systems in the opposite direction, often challenged by a fixation on 'Learning Outcomes' (Benavot & Köseleci, 2015). Ground has undoubtedly been covered, but narrowness of curricula, educational resourcing, the emphasis on creativi-

ty, and the necessary tools and training for educators remain high priorities for developing creativity in education (Adobe, 2013).

Fundamentally, the most direct tension lies in the context of assessment and the competitive and high stakes nature of completing assignments to achieve the best quality degree outcomes. Whilst the proportion of students achieving top honours degrees has increased over time leading some graduate recruiters to call for other means of differentiation, there nevertheless remains a professional premium associated with achievement of a first-class degree through regulatory approaches that can fundamentally drive risk-averse approaches to learning. If creativity is to be developed in higher education, approaches to assessment that mitigate for 'mistakes' or that enable more formally the opportunity to recover from failure, need to be explored in more detail.

Hard vs. soft skills: the challenge of transferability

Amongst a series of challenges in terms of measuring 'employability' rather than 'employment', is that of transferable skills. Definable simply as attributes or abilities developed in one context that are capable of being usefully applied in other contexts, most degree courses articulate transferable skills whilst having little information on which to judge the extent by which this transferability is realised by graduates in their future careers. For example, whilst survey data such as the DLHE discussed earlier in this section provide some useful data, and LEO a potentially more holistic view of career development over time, the extent to which knowledge and skills developed in a given discipline transfer to other contexts is difficult to capture. This is a complex and difficult challenge for all aspects of transferable skills, but in the context of this analysis, 'complex problem solving' and 'creativity' particularly so. For example, precisely how a graduate transfers creative, problem-solving ability developed notionally through scientific study to a graduate level job in retail or finance is at best unclear. At worst, it is impossible even for the individual concerned to recognize.

Transferability of knowledge and skills is more significant for some graduate subjects than others. For subjects aligned with medicine for example, often with highly scaffolded routes into related careers either through professional body accreditation or even sponsorship through study, transferability is considered more within profession than between professions. For graduates of humanities subjects or subjects aligned with art and design for example, transferability may be a more significant factor in determining grad-

uate employability, and whilst figures fluctuate and differ between different economic environments, approximately half of all graduates do not move into graduate level employment in fields directly aligned to their subject discipline.

Surveys regularly highlight how large proportions of graduates move into employment in fields not directly related to their subject of study or relatively quickly switch careers, moving away from discipline related work (UUKa, 2015). Given projections of future portfolio careers and shift of emphasis from consolidated progression in single organisations to increasingly expertise-led and agile employment practices, the transferability of knowledge and skills may become the most important issue for higher education. It remains currently one shrouded in uncertainty and treated somewhat peripherally, core subject knowledge and competences continuing to predominate. In terms if graduate 'success', a premium remains associated with a close relationship between subject discipline and career, or low transferability, whilst most indications suggest increasing value of the capacity for high transferability.

Fitting in or standing out: the challenge and inflexibility of discipline

Related to transferability is the question of discipline, a topic subject to significant uncertainty and tension in and of itself. Given the industrial change and disruption to traditional patterns of employment projected in most studies, the fact that professions will change more in the coming decades than they have for several preceding centuries according to some analysis (Susskind & Susskind, 2015), presents a real challenge to the concept and integrity of subject discipline and the relationship between discipline and the professions. In reality, the global higher education sector has to a great extent hedged its bets and maintained a balance between the old and the new. Traditional subjects remain highly popular whilst new niche courses emerge in all sectors often with short lifespans.

There is considerable variation between and across subject disciplines in terms of how creativity is conceived. Considering Quality Assurance Agency Subject Benchmark Statements for degree programmes in the UK (QAA, 2017), which "describe what gives a discipline its coherence and identity, and define what can be expected of a graduate in terms of the abilities and skills needed to develop understanding or competence in the subject", there are subjects such as Music, Art and Creative Writing, that refer to creativity both

as a serious topic of investigation and as a developmental attribute. There are others, including Accounting that make no reference at all to creativity yet that nevertheless have a track record of developing significant innovation. In terms of graduate attributes, there may be no distinct correlation between graduate creativity and the visibility or prominence of creativity within disciplinary study.

It is tempting to consider how the apparently dramatic changes projected for the professions might lead to or even necessitate fundamental changes to the conception and identity of disciplines in higher education. However, the extent to which changes to universities are necessary, or the degree to which universities should reflect the external landscape rather than stand apart from this reality, are less clear. Abbott (in Brint, 2002), for example, challenges the notion that changes are required and instead stresses the positive power of inertia as well as the resilience of disciplines and established structures and suggests a lack of need for significant change for decades. Recognizing the increasing value and significance of interdisciplinarity, for this to be adequately realised in educational terms, there must of course be 'disciplinarity'.

For example, whilst there are a number of intriguing developments occurring between and across disciplines, such as the research combining materials and biological sciences in the development of self-healing concrete (HealCon), the danger of immediate division into a 'new' sub-discipline may not increase focus, but could lead to ever smaller units of operation and a loss of consolidated strength. Equally, the realisation of one particular innovation combining elements of different disciplines does not in itself imply the development of further knowledge in this area. Intersections between disciplines may produce only a small number of new ideas and quickly subside in importance. Furthermore, such is the integration of global higher education systems, and comparative accountability of universities within national sectors, any profound changes to disciplinary structures would risk placing a given university outside, or at odds with, their most immediate 'competitors' in a way that could be perceived or realized as a risk.

Ultimately, it is the established disciplinary system that has a proven track record for innovation. Whilst there may be argument for universities losing their pre-eminence in some areas (such as development of learning technologies - a field of activity now almost entirely driven by the private sector), the elite parts of higher education remain elite, and remain amongst the most traditional and disciplinary based. Nevertheless, whilst disciplinary boundaries are clearly open borders and not prohibitive of the development of new courses or new research, interdisciplinarity and multidisciplinarity are

restricted depending on the maturity and strength of the centre of gravity of a given discipline. Connections between biological and materials sciences are perhaps to be anticipated given their notional proximity, but connections between other disciplinary contexts and the potential for their intersection to lead to new knowledge and insight, are less likely depending on the combinations involved. For example, it remains much more likely that scientists would speak to other scientists, than a theatrical practitioner and a mechanical engineer would find themselves in the same space never mind the same class. From a graduate employability perspective, deep knowledge and skills related to established disciplines with relevant and distinctive intersecting experience, could add considerable value in terms of employability.

The unpredictable future of creativity and technology

As highlighted in the previous section, perhaps the greatest challenge for universities seeking to develop the employability of graduates lies in the context of digital skills and competencies. In 2015, the House of Lords in the UK published a select committee report by the Digital Skills Committee which called for a radical rethink about educational strategy and for digital literacy to be considered as a third core subject alongside literacy and numeracy so as to meet the needs to the 'second machine age'. Incorporating detailed economic projections, the growth of the digital skills sector alone requires serious consideration in educational terms.

The challenge for universities and the increasing pace and shortening of technological life-cycles, is of determining how 'current', and indeed 'out-of-date', an organization can afford to be. Recognizing a huge investment in IT infrastructure in UK schools in particular but with limited evidence of any uplift in educational achievement, it has been said that "something is going wrong" (Luckin et al, 2012). Indeed, the discourse in higher education is changing rapidly, from misplaced consideration of university students being 'digitally native' experts on their way into university towards a recognition of a fundamentally different approach being required to develop the digital capabilities of students and staff (JISC, 2016).

The question that emerges is one of consistency and ubiquity. Whilst digital skills are undoubtedly of increasing value given the growing significance of new technology in the world of work, there is a challenge in terms of finding capacity to absorb the necessary knowledge and skills though already busy universities and real questions about the extent to which currency can be maintained.

Predicting the future has always been an inexact science. Given the notional pace of change marked by the fourth industrial revolution and the concurrent pace of related technological innovation driving these changes, universities face an uncertain task of responding to a variety of drivers for change, new opportunities and new challenges. From renowned failures to recognise the significance of wireless broadcast and then television in the early 20th century, Thomas Edison's apparent insistence of the impending dominance of moving picture in formal education (quoted in Saettler, 1990, p. 98, in Tamim et al, 2011), to the infamously short-sighted projection by then IBM Chairman and CEO, Thomas J. Watson in 1942, of the global market for computers reaching five in total, potential to be spectacularly wide of the mark with predictions is well established.

Accepting initially that any increased focus on the significance of creativity is a positive thing, given the context of analysis, it is important to note that the uncertainty evident more generally in terms of future projections may also extend to the subject of creativity itself. Already a contested term routinely subject to misunderstanding and suspicion in education, the context in which this creativity is projected to operate itself provides reason to consider whether this remains a stable concept or one itself subject to transformation. If human creativity is likely to be more valuable in the future, do we mean creativity in the way we may currently understand the term? Whilst the landscape beyond the technological singularity may unforeseeable, it would be foolish not to acknowledge that it is technology that provides the most significant single factor in considering how future creativity may be considered in different terms. At the very least, coexistence and conceptual interaction with the creativity of machine intelligence is a very real and current consideration.

Our perception of what constitutes Artificial Intelligence has evolved, from the programming of computers that are able to implement procedural algorithms on to corporeal robotic systems that are able to imitate human behaviours and decision-making processes. Machine learning and neural-information-processing may be considered particular applications of AI; high-level machine intelligence (HLMI) is achieved when machines can, unassisted, complete a procedure more efficiently and more economically than human counterparts. How much faith should we place in algorithms of mechanised decision making that we did not directly create and do not effectively comprehend the inner functions of? How can we be certain that we are not subject to undesirable mechanically introduced biasing?

There are numerous *applied* systems that can for example, utilise automated analytics to interrogate Big Data sets to determine future trends in

business intelligence. There are currently less *generalised* systems able to exhibit learning characteristics as first imagined by Arthur Samuel in 1959 when he coined the term *machine-learning,* with Microsoft's *Tay* chatbox a prime example of how learning algorithms can be easily led astray, particularly if the behaviour they are observing is atypical or deliberately coercive. There are many examples of how automated systems have failed or have been corrupted, see Sample (2007); perhaps as Wachter et al. (2017) suggests, we do require some regulatory body that has the power to audit algorithms monitoring against discriminatory decisions. Perhaps one key future need for human creativity lies in agile regulation of AI and related technological systems.

There are also concerns related to the wider impact of technology on learning. Carr (2010), discusses his fears of a generation with a shallow Internet derived knowledge because of a *"superficial comprehension of many subjects rather than a deep comprehension of just a few subjects".* The Internet may be a system subject to constant interruption and distraction, the call of social media is ever present inducing *decision fatigue* and a diminished capacity for concentration, contemplation; failures in self-control and self-discipline result, see Baumeister (2010); our interactions may be monitored and consequently AI tailored to predict our needs and meet our expectations; predictive questions and the ordering of search results can be an unwelcome influence but despite this the potential for learning and creativity is immense, if the connectivity across massive networks of knowledge can be intelligently navigated.

One possible future for technology is simply that it disappears, becomes fully absorbed or integrated. Given the ease with young children readily accomplish digital skills and the increasingly intuitive, responsive and adaptable nature of technology, there is every prospect of pure augmentation of human capability rather than continued or increased 'technological skills' complexity. Equally, were pessimistic projections about potential malevolence of artificial machines to be borne out, human capacity for creativity would potentially be tested in very different ways. Nevertheless, inaction is unlikely to be a safe option and, as highlighted by Susskind & Susskind, *"To insist that machines should, as it were, know their place, namely, in the back office and not on the front line, is to ignore the signals of change"* (2015: 117).

Why more creativity could be a bad idea

It is important to note that in most studies of traits associated with high levels of creativity, there are grounds to consider where creativity may present a

challenge or even a fundamental problem. Whilst it is possible to envisage how professions could adjust to accommodate increased creativity, it may not necessarily be straightforward to suggest that increased creativity would be useful in every context. After all, most studies of exceptionally creative people are of individuals working very much at the centre of their own worlds often with high levels of personal autonomy (Csikszentmihalyi, 1996) whereas most professions operate in teams often with more tightly defined constraints of operation within specialist roles (Handy, 1996). Novelty may be disruptive in a negative way in particular contexts.

Drawing from the work of Lennox, Wilson and Brown (2016), creativity in teams and through established industrial or professional working practices could be considered problematic in a variety of ways:

1. **Clashing creativity/creative sensitivity:** In team-based professional environments, established leadership structures usually determine decision-making processes. An increase in the supply of creative ideas could align with increased emotional investment and diversity of perspective, and lead to tensions about selection.
2. **Tolerance of ambiguity:** Creativity aligning with a high tolerance for ambiguity and willingness to defer judgement and to leave issues unresolved could compromise productivity in some fields.
3. **Intolerance of boredom:** High levels of creativity align with an intolerance of mundane routine, which could compromise wellbeing and productivity in some industrial roles requiring high levels of specialism and a narrow range of overall experience and activity.
4. **Rebelliousness and nonconformity:** Creativity is inherently rebellious and characterised by challenge to the status quo. Highly creative people are also noted to embody traits of irresponsibility that may be considered a risk in some professional contexts. Whilst popular culture may celebrate the hero maverick trope through pilots or law enforcement officers who 'don't play by the rules', in reality, legal and ethical frameworks exist precisely to mitigate against the negative implications of malpractice. Creative people embrace failure but there are professional contexts where the consequence of failure is too great and a tendency towards the unconventional would be actively discouraged.

Whilst it might be tempting to assume that increased personal and social creativity are unquestionably useful and inherently positive, in terms of employability this may be subject to question. Whilst industrial change is pro-

jected to transform working lives over the coming decades and at least the rhetoric about creativity is positive, there are working contexts within which either creativity may be less desirable or even counter-productive. Discipline-specific creativity deployed in professional circumstances inhibiting opportunity to apply that creativity could erode personal wellbeing and potentially constitute a strategic risk. Professions with high degrees of specialization and articulated expertise may resist innovation even to one part of a process because of the risk of inefficiency or compromise to wider processes.

Summary

The expansion of higher education internationally has led to a congested graduate labour market itself marked by "persistent inequalities in class, gender and ethnicity" (Tholen & Brown, 2017). Actions and initiatives by universities themselves are unable to address these alone. Ranking systems being subject to constant challenge and reinterpretation, with more integrated approaches incorporating different metrics including overall employment rates, quality of employment, business links and institutional reputation amongst graduate recruiters amongst many being explored (Hopkins, 2016).

There is clear indication of the value of 'employability' related activities in higher education (Divan & McBurney, 2016), but also evidence of continued scope for integration of employability with core programmes of study and for optionality of many key opportunities for students across the higher education sector leading to inconsistency rather than effective personalization of experience. Recognising the considerable variation of approach to the employability agenda in the HE sector, there is a developing focus on 'embedding' employability and increasing recognition that "employability is not only about getting that first job. It's beyond that simple measure of employment" (Norton, 2016: 2). Quite how far beyond is subject to very different interpretations and open speculation. Nevertheless, for the purposes of this discussion, employability is considered in the broadest possible terms. Recognizing the influence of metrics-based scrutiny of albeit contentious employment data, and inevitable requirement for universities to adjust approaches to meet the most immediately favourable outcomes, employability in broad terms also encompasses longer term implications. In this text, the term is treated holistically and therefore synonymous with not only economic productivity but also personal flourishing.

Possible futures: developing creativity in universities

Universities find themselves in the unenviable position of having to prepare graduates to 'fit' into defined roles with explicit professional requirements, to 'stand out' within these environments, and to be prepared for the potential transformation or even dissolution of related professions and employment roles. Consider for example the number of university students currently studying degrees related to accounting and finance despite the growing trend towards integration of AI computer systems in related business operations and seeming inevitability of the handling and processing of unstructured information becoming AI rather than human led in the near future (Dhar, 2017). With what certainty and over what timescale should a projection of professional decline trigger changes to disciplinary study in higher education? Should academics in the field of accounting be working to find new roles for accountancy skills alongside computers? Resisting the technological transformation of their profession? Or simply focusing on the transferability of education in accountancy fields to other professional environments? At what point should a profession, if indeed ever, be 'let go'?

The sustainability of current educational systems is worth consideration for two reasons: 1) The potential for risk associated with failure to reform or to reform quickly enough; And, 2) The risk that reform is undertaken uncritically or at too great a pace. Nevertheless, the seriousness with which very different future needs are being considered does at least represent an opportunity for positive transformation. There is renewed receptiveness to change and openness to new ideas. Recognizing decades of advocacy and research, there has never been a more open opportunity for serious discussion about creativity in higher education.
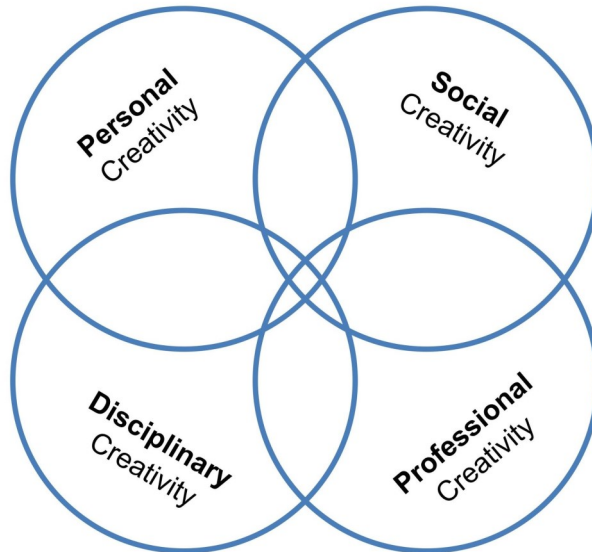
Figure 1 - Domains of creativity

Recognizing the value of an integrated focus on creativity rather than, for example, distinguishing between the teaching of creativity and creative teaching (Jeffrey & Craft, 2010), the four domains encapsulated in Figure 1 above reflect a pragmatic view of where creativity is realised and most commonly associated, reflecting the overwhelming consensus in the literature of creativity being dependent on a defined context for recognition and appreciation (useful novelty measured against established conventions), and a consequence of integrated experience and effective "bisociation of perceptual matrices" (Koestler, 1964). The predominance of each of these domains, their relative diagrammatic importance or size, and extent to which they respectively intersect, will of course vary significantly according to individual circumstances. Nevertheless, that they intersect is fundamentally important for creativity to emerge, and be recognized.

For creativity in universities, effective consideration of these domains from an organisational strategy perspective is most usefully framed by the following questions:

Personal creativity
- What capacity and opportunity do students and staff have to develop their personal creativity?

- How does the university encourage and support personal creativity?
- How does organizational strategy make the most of creative diversity?

Disciplinary creativity
- Where is creativity in the disciplines?
  - Is this clearly articulated?
  - Is this actively taught, encouraged and supported?
  - Is this recognized and assessed appropriately?

Social creativity
- Is student and staff creativity through learning connected to real-world problems and challenges?
  - Is collective creativity applied in solving real problems?
- Is creativity sufficiently socialized, socially engaging and celebrated?

Professional creativity
- Do organisational strategies maximise the creative potential of the academic community?
- Are learning and teaching strategies for creativity professionally informed and applied?

Recognizing that the answers to these questions will themselves undoubtedly raise further questions, require reinterpretation depending on the higher education context, or possibly even surface difficult truths, they are, nevertheless, the right questions to ask.

Depending on the answers to these questions, the following framework represents a range of possible points for further consideration and methods for the development of creativity through higher education study. Key points of reference are:
1. Creative pedagogies
2. Transferable creativity
3. Integrated creativity
4. Applied creativity
5. Digital creativity

1. Creative pedagogies

Reconsidering creativity and levels in higher education

If creativity is to flourish in higher education, it needs to be nurtured throughout higher education. More importantly it needs to be anticipated and recognized. Given that most students beginning their studies at university have been encouraged to recognize their own creativity through preceding educational experience, it is somewhat anomalous to arrive at university only to be told that creativity is then again out of reach or even off the agenda for a few years. How quickly universities understand how students are creative and provide opportunities for the continued development of creative abilities may be critical. If the search for that understanding does not begin at the start of university study, it may never be possible to discover, never mind then nurture and develop.

There being considerable debate about the value of 'level descriptors', 'learning outcomes', 'assessment criteria' and indeed the whole process of academic recognition more generally, the 'Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies', or 'FHEQ' (QAA, 2014), for example, which is the 'definitive reference point for all UK higher education providers', refers only to creativity in the context of 'creative arts' disciplines, and as an outcome of study at postgraduate Masters level. We have at least to talk about creativity if we are to notice it, and expect it, to find it. We need to acknowledge that creativity is inherent to learning at all levels and develop more nuanced language and understanding to define creativity through all levels of university study. If 'Pro-C' creativity is to be realized, 'mini-c' creativity needs to be fostered and developed earlier and in a coherent way (Kaufman & Beghetto, 2009).

Being clear and fuzzy about disciplinary creativity

Whilst it is of course important to consider receptiveness to creativity, it is also important to be 'fuzzy' in this expectation. After all, it is not possible to accurately anticipate the nature of novelty that will emerge where creativity is concerned. This means that frameworks for the reception, evaluation and response to creativity need to be open and flexible.

Revisiting assessment design

The problem of assessment is perhaps the most important and paradoxical of all. Creativity only becoming apparent on recognition or judgement, related

protocols and their experience highlight the often consequential and invariably inhibiting tendency towards risk aversion, fear of failure, the problem of standardization, as well as numerous other judgement accuracy issues relating to unconscious bias and general reliability. Where creativity is judged to be so can be the scariest place to be when that is what is being aimed for, scrutinized and judged. It is therefore important to consider ipsative or more personalized approaches to the assessment of creativity for this to mitigate against the inhibiting effects of standardized approaches. In simple terms, consideration should be given to the assessment 'for' rather than simply 'of' creativity.

For example, whilst not wanting to open a more substantive discussion about the value of learning outcomes here, it might be possible to develop more open approaches to the assessment of creativity, or assessment for creativity, through learning outcome design. Consider for example how a focus on 'recovery from failure' or development of 'ridiculous solutions' to a given challenge might engender different approaches to assessed work, its interpretation, and a narrow focus on the 'right' answer.

2. Transferable creativity

Fundamental to any conception of creativity is the notion of novel connections and combinations. To foster effective patterns of creative thinking, opportunity must be provided for novelty to emerge. This may be most effectively supported by integrating opportunities for application of subject knowledge and expertise in unusual contexts. For example, this may involve students tackling challenges more commonly associated with other subjects and then reflecting on their experience with reference to their own discipline, or more active collaboration between and across disciplines.

Development of longer-term measures of employability such as the 'Longitudinal Education Outcomes' (LEO) measures being explored in the UK, and related focus on 'Learning Gain' and metrics to evaluate personal and education development, provide an opportunity for closer consideration of creativity and a more holistic approach. Reconsideration of 'success' in graduate employment to acknowledge where expertise has successfully transferred from one disciplinary context to another, as a creative act in and of itself, could help to develop a fundamentally different conception of the transferability graduate knowledge and skills. If the future is to be characterized by diversification and more routine career change, then transferability of knowledge and skills is likely to become more important. The application of

knowledge and skills in unfamiliar contexts may therefore become a more effective way of developing graduate capabilities.

3. Integrated creativity

For creativity to be developed and recognized, it needs to be embedded and part of routine discourse. Staff and student development in knowledge and understanding of the nature of creativity, the language of creative interpretation, and methods for creative thinking and working, need to be supported.

Creativity is best developed in universities through an academic community approach. Dialogue between and across subject disciplines and the integration of different perspectives all serve to enrich creative dialogue and discussion. Defined opportunities for interdisciplinary and collaborative working through project-based or problem-based learning activity can also enrich opportunities for learning.

4. Applied creativity

Creativity also flourishes where it is applied. Consideration could be given to the development of longer-term projects, indeterminate projects and supplementary skills development in university study. For example, given previous discussion about the enrichment of creative potential through exposure to different ways of thinking and different contexts for applying knowledge, the extent to which connections are made between curricular and extra-curricular activity could be developed. Life drawing classes for electrical engineers, sport and fitness study for graphic designers, or software coding for biologists, could all provide real opportunity for new connections and ideas to emerge.

Equally, the tendency in higher education for modularity, or the compartmentalization of degree study into smaller discrete units of study with defined assessment and completion points, may stifle the development of longer-term and larger scale creative ideas. There is considerable value in developing opportunities for students to engage with both longer term and more indeterminate projects throughout university study. For example, there are considerable metacognitive skills benefits in the study of a musical instrument, but this requires a more consolidated and longer-term approach to realize benefits fully.

5. Digital creativity

Finally, and perhaps most significantly in the context of this chapter, is the question of creativity and technology. The development of digital capabilities and fluency in the use and application of technology requires investment and focus. No longer simply the means by which creativity is documented, shared or demonstrated, technology provides a context for creativity itself. Consequently, dexterity and confidence in the application and exploration of technology needs to be a more explicit and more active element of university study across all disciplinary domains. Equally, creativity in the context of increasingly sophisticated technologies needs to become a more active topic in the wider discourse about disciplinary practice and personal development.

Summary

Ultimately, a perfect education system is impossible to achieve. Such are the constraints inherent in all education systems that compromise is inevitable, and such are the number of compromises that imperfection is unavoidable. Equally, educational systems can never be perfect in isolation. Wider socio-economic and employment conditions ultimately determine the extent to which university graduates succeed, in tandem with their capabilities. Educational systems work if they 'work' where they are, in the conditions in which they operate, and where there is receptiveness to the knowledge and skills developed through education. Nevertheless, whilst boundaries between education, work and everyday life have become more porous in recent decades with the development of online education, MOOCs, and work-based-learning as typified by degree apprenticeships as in the UK, most educational systems maintain restrictions of access to education, both deliberate and inadvertent that need to be addressed if full creative potential is to be realized.

Conclusions

The focus of this chapter has been the future of creativity and the role of higher education in responding to the fourth industrial revolution. Given the uncertainties evident in most reasonable projections of the future of jobs and the seeming inevitability of continued and increasingly pronounced technological disruption, educational systems are adapting, or at least now beginning to ask serious questions about change. Whilst there is an element of déjà

vu about any discussion of creativity in education, a topic that has been actively explored for decades, there finally seems to be a receptiveness to the value of rethinking educational systems more substantively. Preparing for uncertainty is a complex challenge. Nevertheless, creativity thrives on uncertainty and creative people are more open to the challenges faced by 'fuzzy' problems.

Que Sera, Sera (Whatever Will Be, Will Be)?

If the future is to be marked by an increased pace of change in the need for new knowledge and skills acquisition in employment, different approaches may be required in terms of flexibility of educational opportunity. Considering the paradox of discipline—*What subjects will be most important? Where can we best focus our educational efforts?*—the answer may not be the direction adopted by most educational reform processes. Rather than concentrate efforts into an ever-narrower range of technical subjects, uncertainty suggests that knowledge needs to be disaggregated and diversified, and educational opportunity developed for inclusivity. It is undoubtedly the case that digital skills are, and will become, increasingly valuable. Nevertheless, inferring therefore that other knowledge and skills will become less important might be a dangerous assumption. Equally, given the anticipated needs for retraining and updating of skills for future careers, universities will need to develop more flexible opportunities for engagement.

The future is, ultimately, not being sold well. There is a sense to which we are in an increasingly obstacle strewn race of our own making and that decisions about next steps are driven more by reaction than by design. Change itself is inevitable as it has always been but increasing speed of reaction and reform in universities could be as risky as no change at all. Perhaps the most important questions in this discussion are about the extent to which universities respond to external environments or seek to disrupt and shape them, and whether graduate knowledge and skills is about productivity and definable 'fit', or much less definable personal fulfilment. In the context of uncertainty and change, nature would suggest that diversity always proves most resilient. Greater diversity in universities might not only be the most effective way of developing the knowledge and skills required for the future, it could also be the most effective way of developing creativity itself.

Creativity is ultimately very simple. It's just thinking and adapting rather than just remembering and repeating. It's just making new stuff. Rather than thinking about creativity as a defence mechanism for the future, perhaps we

should simply focus more on the here-and-now and how we can be creative in shaping that future.

> *"In the end, it all comes down to people and values. We need to shape a future that works for all of us by putting people first and empowering them. In its most pessimistic, dehumanized form, the Fourth Industrial Revolution may indeed have the potential to "robotize" humanity and thus to deprive us of our heart and soul. But as a complement to the best parts of human nature—creativity, empathy, stewardship—it can also lift humanity into a new collective and moral consciousness based on a shared sense of destiny. It is incumbent on us all to make sure the latter prevails."*
> Schwab, K. 2016.

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CHAPTER ELEVEN

CREATIVITY IN HIGHER EDUCATION INSTITUTIONS: MULTI-DISCIPLINARY CURRICULUM FROM CONCEPT TO LAUNCH

GEORGE G. MOKER

ABSTRACT Creativity is important and is often mentioned in 21st century education. Creativity is viewed as a key skill necessary for critical thinking and problem solving. Over the past four years, Suffolk University, a higher education institutions (HEI) designed and implemented an interdisciplinary creativity and innovation (CI) graduation requirement for undergraduate students beginning in 2014 and 2015 for the Sawyer Business School (SBS) and the College of Arts and Sciences (CAS), respectively. This achievement overcame institutional challenges of two schools, with distinctly different cultures, to accomplish a new, shared general education requirement, that is designed around an agreed-upon definition of creativity and innovation, as well as a centralized course description and three mandated learning goals. More than 1,200 students (primarily first-year) choose from 18-24 course sections, with content designed from both schools, from 10-15 disciplines. Preliminary discussion between the two schools began in 2013, with a partial roll-out (for 600 students) in 2014, and full implementation (remaining students) in 2015. The CI program is overseen by the CI Steering Committee, of faculty from two schools, and is under the authority of the university's provost. The steering committee has broad, de facto authority in this transitional stage, and is responsible for calling for proposal, reviewing and estimating submissions, approving course offerings, training faculty, and evaluating faculty performance, as well as the overall program. Currently, the CI Steering Committee is transitioning to a university-based, shared general education curriculum committee, to streamline curriculum governance. To date, approximately 3,000 students have met their undergraduate creativity and innovation requirement. The first graduating class will be SBS undergraduates in May 2018, and CAS undergraduates in May 2019.

Keywords*: domain-specific creativity, creativity assessment, creativity curriculum

Introduction

In 2013 and 2014, Suffolk University's (Suffolk) undergraduate faculty assembly from the College of Arts and Sciences (CAS) and Sawyer Business School (SBS) approved a new graduation requirement in creativity and innovation (CI). This new requirement is part of a shared general education curriculum overhaul and became effective during the 2014 and 2015 fall semesters for SBS and CAS respectively. The CI learning goals are coordinated and course offerings are from multiple disciplines among both schools. The CI requirement was formalized as the CI Program (Program) by the provost's office shortly after approval, leading to the creation of an oversight de facto steering committee (consisting of four members from each school, with two members serving as co-chairs, referred to as the CI Steering Committee). The CI Steering Committee (Committee) subsequently assumed responsibility of oversight, including (a) calls for proposals (from all disciplines in CAS and SBS), (b) review of proposals for curriculum compliance, (c) estimate of CI needs based on first-year enrollment, and balance between both schools and the various disciplines, (d) approval of courses to be offered, (e) training of faculty, both with approved courses, or expressing interest in the Program, and (f), evaluation of faculty and program performance. The Committee is responsible for oversight of more than thirty individual courses (spread over various academic semesters) intended to meet the CI requirement for approximately 1,200 first-year students, each year.

Suffolk is a private institution, located in Boston, Massachusetts. Founded in 1906, the university consists of three schools: Suffolk Law School; the College of Arts and Sciences; and the Sawyer Business School. The university has more than 5,000 undergraduates with 35 degree programs (Suffolk University, n.d.).

Background

The multi-disciplinary, CI concept evolved from collaboration between CAS and SBS faculty related to shared, general education requirements. Each school appointed their own task forces to begin the multi-year process of redesigning their respective core curriculum. Embedded in this endeavor were 24 required undergraduate credits that were shared between both schools, referred to as shared general education (shared gen-ed). Shared gen-ed credits are primarily required by SBS, for their students, that CAS would typically provide. Examples of shared gen-ed would include humanities, economics, mathematics, science, and writing. To address shared gen-ed requirements in the redesigned curriculum, each school's task force appointed members to serve on the shared gen-ed sub-task force. It was at this level that creativity and innovation gained momentum.

Both schools had a vision of emphasizing creativity and innovation in the new curriculum, and the shared gen-ed task forces of each school supported an undergraduate creativity requirement designed and implemented by both schools as part of a unified effort. This was a unique position, given the level of past collaboration. To support the collaborative creativity effort, the shared gen-ed task force appointed four faculty from CAS (from a legacy ad hoc group exploring creativity) and one faculty from SBS (within the entrepreneurship realm), to a creativity task force (CI Task Force). It was this committee that led to the design and implementation of the current Program. The shared gen-ed task force was in continuous communication with the CI Task Force, thus creating a collaborative environment for brainstorming, iteration, and eventually, Suffolk University's CI Program. The CI Task Force was charged with making a proposal outlining how both schools would meet the impending creativity and innovation undergraduate requirement.

According to Simonton (2012), "creativity is not only an intellectually interesting subject, but also a phenomenon of immense practical importance" (p. 221). However, it will be critical to avoid the trap "as if there was some generic, one-size-fits-all procedure or mechanism that could apply to any domain of creativity" (Simonton, 2012, p. 219). The stakeholders of Suffolk University, consisting of students, faculty and administration, collaborated to explore this opportunity.

The CI Task Force

The five members of the CI Task Force convened for an informal, introductory meeting, to discuss their individual and collective vision for creativity and innovation, as well as their role in the shared gen-ed curriculum redesign. Lacking any precedent to follow, the CI Task Force started from scratch. This led to each member conducting their individual creativity research, and in more formal meetings, bringing the research together to advance the charge of the CI Task Force.

After a series of meetings, the CI Task Force determined that the following steps were necessary:
- Brainstorm single definitions of creativity and innovation;
- Identify shared learning goals;
- Create a shared course description;
- Provide flexibility with additional learning goals and secondary course descriptions;
- Develop governance structure; and
- Prepare and present CI Program proposal.

Definition of Creativity

The CI Task Force, after in-depth discussion and analysis, agreed that the Program definition of creativity is:

Creative people recognize and act on compelling opportunities for discovery. They delve into the unknown; they research; they repeatedly reflect and adapt ideas until they find solutions. They are responsible for dynamic innovations in the arts, science, and in business. When people are creative, they embrace ambiguity, accidental results and unconventional ideas. Creative people take risks and are willing to fail. They practice peripheral thinking and effectively use metaphor, analogy and persuasive story telling. In order to be successful, creative people do not passively wait for inspiration; they practice the disciplined habit of making something meaningful out of nothing (*Suffolk University Creativity and Innovation Information Packet*, 2016).

Definition of Innovation

The CI Task Force, agreed that the Program definition of innovation is:
Innovation in modern usage means more than the introduction of an original idea or a solution to a problem; it is the lengthy and wholesale process of transforming an idea into a product (or process) meant for widespread practical use. Almost by definition, a single person, or even a single group, can't create an innovation alone. The task is too variegated and involved. Innovation is an extension of the creative process; it is the practical application of creativity in the service of some need, explicit or as yet unarticulated, be it economic, cultural, operational, or even the need for survival. Creative invention is necessary for innovation and innovation is necessary for creativity to affect a human need. Many new ideas, discoveries, and inventions exist without application. The point of innovation isn't technology, scientific understanding, or art itself; the point of innovation is what new technology, scientific understanding, or art can do (*Suffolk University Creativity and Innovation Information Packet*, 2016).

Shared Learning Goals

The CI Task Force identified the following learning goals:
Upon successful completion of this course, students will know/ understand how/to a) recognize and foster creative thinking to solve problems; b) cultivate the knowledge and skills necessary to engage in fruitful collaborations; and c) increase their verbal and non-verbal communication skills (*Suffolk University Creativity and Innovation Information Packet*, 2016).

The learning goals are consistent with an approach that generates unexpected answers to questions, such as contradictory conclusions, which are

explored, thus removing the traditional limits restricting creativity, such as generating solutions to satisfy teacher expectations (Ackoff & Greenberg, 2008).

Faculty may add secondary learning goals to customize each course to an instructor's individual discipline.

Shared Course Description

The CI Task Force created the following shared course description:

> This course is designed to demystify the creative process by introducing students to creative practice as a disciplined approach to problem-solving and innovation. Students will be encouraged to synthesize existing ideas, images, concepts, and skill sets in original way, embrace ambiguity and support divergent thinking and risk taking (*Suffolk University Creativity and Innovation Information Packet*, 2016).

Faculty may add a secondary course description to customize each course to faculty academic discipline.

Learning Objectives and Additional Learning Goals

Given the multi-disciplinary nature of the Program, the CI Task Force strongly supported faculty course customization as a supplement to the shared course description and learning goals. In addition, rather than selecting shared learning objectives, the CI Task Force gave flexibility from a list of learning objectives, in support of faculty academic expertise or interests. The CI Task Force recommended the following:

Optional learning goals. Faculty would have the option of adding learning goals to the required shared goals, at their discretion. The CI Task Force provided some non-binding recommendations for additional learning goals that included:

- Upon completion of this course, successful students will *understand* the value of interdisciplinary research and problem solving.
- Upon completion of this course, successful students will *understand* how to meet and respond to ambiguity and risk in a variety of contexts.
- Upon completion of this course, successful students will demonstrate an awareness of diverse perspectives and understand how to adapt to individual differences.

Optional learning objectives. The CI Task Force preferred greater flexibility in learning objectives and did not recommend required shared learning objectives. Instead, the task force provided a list, from which faculty must select at least three objectives, from which to make a selection. The list of learning objectives included:

- Upon completion of this course, successful students will be able to identify challenges as opportunities in order to develop innovative ideas and outcomes.
- Upon completion of this course, successful students will be able to approach problem solving reiteratively through testing and critiquing until feasible solutions are found.
- Upon completion of this course, successful students will be able to display essential interpersonal skills needed for effective teamwork.
- Upon completion of this course, successful students will be able to draw from diverse fields to address problems and construct feasible solutions.
- Upon completion of this course, successful students will be able to comply with writing and speaking conventions appropriate to different rhetorical situations.

(*Suffolk University Creativity and Innovation Information Packet*, 2016)

Governance Structure

The CI Task Force recommended a de facto steering committee to oversee the launch of the Program, as there were currently no other courses, requirements, or programs, that were designed and implemented by both schools. Historically, shared gen-ed has been housed in the respective academic departments within each school, rather than at the university level. However, given the expediency of the CI approval process, a transitional governance structure was recommended, thus the creation of the CI Steering Committee. The Committee is charged with calling for and reviewing proposals, estimate the number of sections needed (based anticipated enrollment), approve courses, train faculty, and evaluate the program.

Program Proposal and CI Task Force Termination

The CI Task Force prepared its CI Program proposal using the aforementioned program design, for review by the faculty assembly of both schools. The SBS faculty assembly approved the proposal in 2013, to begin in the fall of 2014. The CAS assembly approved the proposal in 2014, to begin in the fall of 2015. After approval by SBS, the provost's office, some members of the CI Task Force were appointed to the new CI Steering Committee, with the addition of new faculty. Having completed its charge, the CI Task Force was terminated.

The CI Steering Committee

The Committee was established, as a de facto group, by the provost in early 2014, for the planned rollout of CI courses for SBS students in the fall of

2014. CAS students would begin their requirement in the fall of 2015. The Committee consists of eight individuals, including three faculty from the CAS, three faculty from the SBS, and two ex-officio representatives from the deans office of each school. One faculty member from each school serve as co-chairs. The Committee is charged with calling for and reviewing proposals, estimate the number of sections needed (based anticipated enrollment), approve courses, train faculty, and evaluate the program, in a transitional capacity, until shared gen-ed governance is established at the university level. The Committee plans for a 60%-40% ratio of course offerings from CAS and SBS respectively, as well as a broad range of disciplines offered, and was responsible for designing and implementing the current Program, and its initial, recurring, and new course offerings. The Committee initially had to have at least 10 new courses in the pipeline, for the estimated 600 first-year students expected for the fall of 2014, and another 15 courses in the pipeline, for the estimated 1,200 first-year students expected in the fall of 2015. Since its inception, the Committee has maintained the philosophy of the former CI Task Force, as one-half of the members are task force's members were appointed to the Committee.

Committee Organizational Structure

Figure 1 illustrates the Committee's organizational structure within the university.
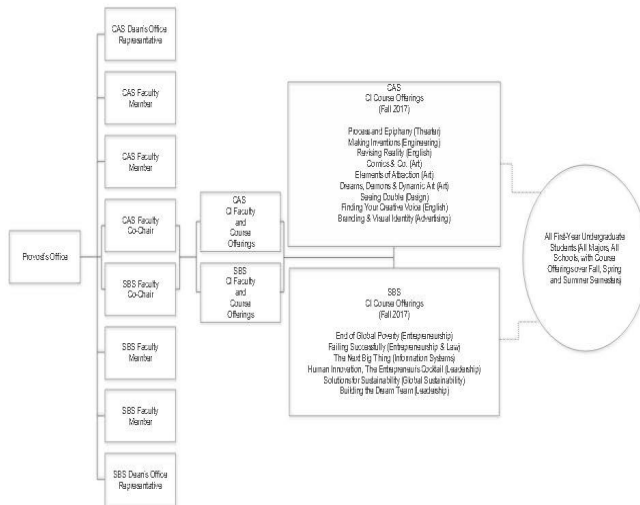

Figure 1. CI Steering Committee Organizational Structure

The Committee is a de factor group, organized as part of the university's transition to a full shared gen-ed entity at the institutional level. The organizational structure demonstrates the relationships between the provost's office, Committee co-chairs, the Committee members, faculty, and students.

Committee CREATE Process

In what the author describes as the CREATE process, the functions of the Committee have evolved into a complex series of tasks. The CREATE model, identifying the Committee's roles and responsibilities, as indicated in Figure 2.
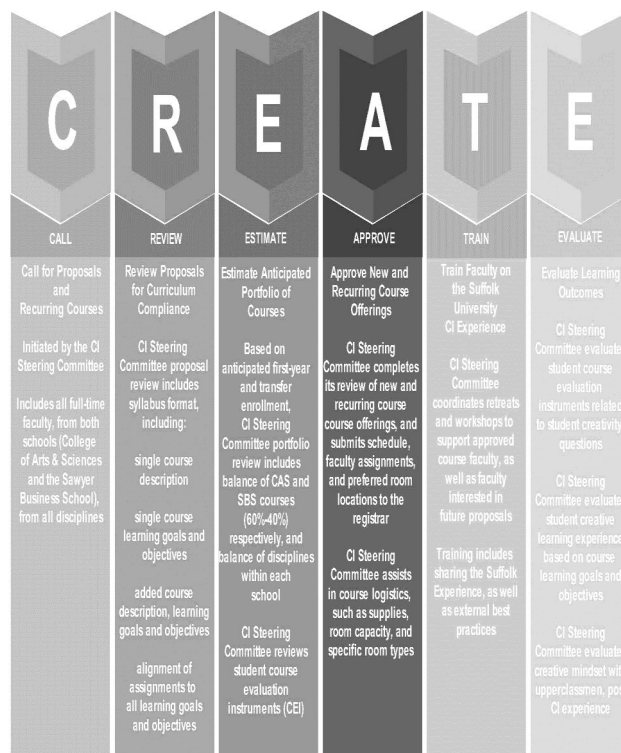

Figure 2. CI Steering Committee CREATE Process

The author describes the Committee's processes as CREATE for purposes of defining the depth and range of the Committee's actions in implementing the Program, as approved aby the faculty and envisioned by the former CI Task Force. The stages in the CREATE model include:

Call for proposals and recurring courses. At the outset, the Committee had to call for proposals to create ten new CI courses to meet the de-

mands of 600 first-year students. The Committee did not accept modifications to existing courses, but rather requested new courses to avoid the incremental addition of creativity to courses that may not have met the shared learning goals. For the 2014 Fall Semester, CAS faculty developed six new courses, while SBS faculty added four., For the 2015 Spring Semester, fall courses were repeated and additional courses were added. For the 2015 Fall Semester, the number of new courses was nearly doubled, and recurring courses were informally reviewed. This process repeated itself in the 2016 Spring Semester. For the 2016 Fall Semester, recurring courses were more closely scrutinized, and fewer new courses were added, as the inventory of active courses and pending proposals, provided a sufficient flow of courses to meet the objectives of the Program.

Review proposals for curriculum compliance. The proposal review process determines whether a new course meets the shared course description and learning goals, in addition to at least three learning objectives. The process includes review of all assignments for alignment with the learning goals for assessment purposes. The Committee also discusses the faculty's secondary course description, discussion of iteration and ambiguity within the course design, potential overlap with other CI courses, or a modification to an existing non-CI course. For recurring courses, faculty evaluations, as well as updated syllabi are reviewed for curriculum compliance.

Estimate anticipated portfolio of courses. As the Program builds its inventory of new courses, the resultant portfolio is assessed to determine the balance between the two schools, based on a 60% to 40% target for CAS and SBS respectively. In addition, the portfolio is reviewed for balance between disciplines. Finally, enrollment projections are reviewed to estimate the number of CI course sections that may need to be offered, which is typically 18-24 per semester.

Approve new and recurring course offerings. After completing proposal and portfolio review, the Committee approves new and recurring course. This approval leads to entry into the registration system for student enrollment. Approved and active courses are included in Table 1 (*Suffolk University Creativity and Innovation Information Packet*, 2016).

Table 1

CI Steering Committee Approved and Active Course Listing

Train faculty on the Suffolk University CI Experience.

CI Steering Committee Approved and Active Course Listing

Course Title	School/Department	Secondary Course Description
History: Creating America	CAS/History	What made Benjamin Franklin such a creative force in American history? We will explore the many facets of Franklin' life—printer, writer, scientist, statesman—and learn about Benjamin Franklin's many creative endeavors—in science, politics, and literature. Working in teams, students will examine Franklin's political and diplomatic ventures, and will recreate some of his scientific experiments.
Comics & Co.	CAS/NESAD	Using visual narrative based on different as the means of exploration, students will be led through a series of exercises that challenge their assumptions about narratives and creativity, which will broaden their perspectives and excite their imagination. The relationship between critical, creative and inventive thinking will be the basis for individual and collaborative projects. Students will have the opportunity to explore creativity in a variety of transmedia forms.

Poetry Out Loud	CAS/English	Students will develop a deep understanding of two seminal books of 20th century poetry and other key 20th century poems as they plan and execute small-group, end of semester reading performances. Students will write creative response poems to increase their understanding of the texts, and through cooperative decision making strategize effective ways to present their own poems and poems by Bishop or Frost. The class format will foster direct spoken engagement with matters of sound, rhythm, tone, and meaning. Final reading aloud performances will be recorded and added to the Suffolk University Poetry Center Archive.
Creative Writing and Literacy	CAS/English	This course will explore the value of creativity and play in developing reading and writing skills and the habits of lifelong learning, both in our own lives and in the lives of young people in Boston. In this course, we will work closely with the non-profit literacy organization 826 Boston, which works with students ages 6-18 on reading and writing skills through playful, creative workshops, as well as tutoring and other kinds of support. Students will learn about the work of 826 Boston by volunteering with the organization, and by the end of the semester you will conceive, plan, and run creative writing workshops of your own at 826 Boston.

Solutions for Sustainability	SBS/Entrepreneurship	As the majority of the world population now lives in cities, for the first time in human history, issues of urban sustainability have become more complex and more important than ever before. Presented with case studies of urban efforts to gain a sustainability foothold, students will utilize ideation, critical thinking, and strategic decision making to both identify root problems and to present solutions. This course will lean heavily on ideation processes, teamwork, and logical methods of analysis to pursue actionable solutions for significant problems. The methods of problem identification and solution analysis learned in this class will be readily adaptable to many complex problems, helping the students to make informed and decisive determinations in their careers.

Process and Epiphany	CAS/Theater	Despite its mystical connotations, creative epiphany is the result of a long engagement with the creative process that results in a surprising and unpredictable understanding of a concept or the solution to a problem. In the way that the discoveries of science are guided by the scientific method, the path to creative innovation is through a directed creative process. All creative innovators follow such a directed creative process, whether they are industrial designers or fine artists, performers or inventors, architects or entrepreneurs. This course explores both historical examples of individuals whose creative innovation changed the world, as well as hands-on collaborative, practical problem solving employing the creative process.
Making Inventions	CAS/Engineering	This course examines cutting edge technologies, the science behind them, and their practical application and follow-up success or failure. It also provides the students a chance to design their own inventions or approaches to meeting some common every day needs, such as protection, health, communication, and recreation. The history behind some remarkable inventions will be presented, including the impact of persistence, fortuitive accidents, and spectacular failure. Of primary importance, students will work in small teams throughout the semester to identify something useful to invent and determine at least one viable approach to implementing it (conceptual). They will also engage in exercises to promote creativity and innovation.

Writing for the Stage and Screen	CAS/English	This course will engage students in the process of script writing. Working in groups of four to five they will craft adaptations of stories, create original scenes, or review sketches. By the end of the semester they will produce a complete script. Each alternating week, one group will serve as the "executive committee" that will approve the final draft of the script-of-the-week. There will be exams based on the textual study of collaborative and adaptation techniques.
Designing the Next Big Thing	SBS/Information Systems	This course demystifies the creative process by introducing students to creative practice as a disciplined approach to problem-solving and innovation. Students will be encouraged to synthesize existing ideas, images, concepts, and skill sets in original way, embrace ambiguity and support divergent thinking and risk taking.

Boston's Creative History	CAS/NESAD	Our collective social consciousness is formed by physical space; through a mixture of exploration, discovery, and making, students will delve into the city that surrounds them, developing a sense of ownership and engagement in Boston's public space. During the course of the semester, students will uncover the ways that art and architecture have shaped the souls of cities around the world, using Boston as a template. In a series of local field trips, students will explore Boston through its art and architecture, focusing not only what is, but on what might have been -- designs that were ultimately unrealized. Through interview and visits with local artists and designers, students will also learn about the process of shaping public space, uncovering the myriad of ways that design decisions are political in nature. As a capstone to the course, students will create their own city plan -- identifying and researching a chosen social or physical challenge the city faces, then developing a proposal that would address their chosen issue. These design proposals will then be enacted using augmented reality. Like a layer of invisible ink, these projects will form a phantom city over the physical realities that surround us, displaying the dramatic potential of the imagination.

Seeing Double	CAS/NESAD	Always wanted to explore a creative side but never had the opportunity to take an art class? Here's your chance! Sync the power of icons/ images with ideas and making. We will use cellphone and printmaking technologies in a workshop style environment. Rather then a lecture based class, this class we will play, learn and build new Neurological pathways towards creative thinking. Come to every class excited to learn, make and discover. This course will give you the building blocks for innovative thinking beyond the classroom. Power is in the image. As in the way a dream can grip you, images carry incredible amount of influence and creative potential, when they are "seen." Glimpses of these images circulate in media, movies, cell phones, and so on. Learn to develop your own images and understand the broad world of images of human culture.
The Design of Everything	CAS/NESAD	This course will explore a selection of the genius personalities and their creative work in 5 distinct areas of human creative endeavor; art, science, nature, technology and the built environment. The course explores the underlying similarities in the process of their discovery, invention and creativity across the disciplines. Studying such names as Newton, Warhol, Hawking, Jobs, Gaudi and Banksy, students will uncover the process of design through research, analysis, synthesis, iteration and error. In class group projects will allow a hands-on opportunity to create.

Coastlines, Symmetry, Illusion	CAS/Math and Computer Science	How do you measure the length of a coastline? How much symmetry is possible? What is an impossible object? How did the Mayans measure proportions? In this course, students will delve into these and other questions with a visual theme. While some will be clear-cut, others will be open-ended and require some choices, estimates or assumptions to be made. Throughout, the emphasis will be on creative problem solving.

| Creating the Dream Team | SBS/Entrepreneurship | Every successful venture today is based on effective teamwork. Unlike a typical lecture format, Creating the Dream Team is a course that utilizes experiential group learning to provide students with pivotal team-building skills. These essential skills are vital for everyone's future success in the business world. As team players, students are challenged to think creatively. A collaborative problem-solving process is used to analyze "real life" business situations. Teamwork involves research, data collection and information analysis to develop creative solutions to typical business problems. Teams will utilize multimedia tools to present their innovative ideas. Classmates will provide peer feedback and review. Through iterations, all students will assume roles as project leaders, keynote speakers and collaborators on a series of Team Challenges. Upon successful completion of this course, all students will have formed working "dream teams". As reinforcement and final evaluation, Dream Teams are required to create a multimedia Capstone Event as a course performance measure. This capstone presentation will "showcase" all of their newly acquired "dream" team-player skills. |
| Living and Laughing | CAS/Communications and Journalism | This is a course about laughing and living. While it sounds fun, it can also be complex, confusing, complicated, and convoluted. Laughter and humor are also very personal. The things that make you laugh are rooted in family, culture, and personality. We are going to spend the semester getting to know ourselves and each other in an attempt to understand more about why we enjoy what we enjoy. |

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Virtual Global Trekking: A Traveler's Perspective on Creativity	CAS/Physics	This course will examine creativity and innovation through the lens of place. Modern geography is an all-encompassing discipline that foremost seeks to understand the Earth and all of its human and natural complexities - not merely where objects are, but how they have changed and come to be. The world is filled with ideas and perspectives. By changing your location, new perspectives emerge. Also, by examining locations, patterns emerge we can connect dots that were once separate. This course will rely heavily on Google Earth. With this program, the user can view the physical world from any perspective. It also allows access to the limitless information on the Internet as well is the 2D maps, the 3D virtual realities. We will learn how to use Google Earth to conceptualize and explain the far corners of the globe.

The End of Global Poverty: Is Entrepreneurship a Solution?	SBS/Entrepreneurship	This course is designed to demystify the creative process by introducing students to creative practice as a disciplined approach to problem-solving and innovation. Students will be encouraged to synthesize existing ideas, images, concepts, and skill sets in original way, embrace ambiguity and support divergent thinking and risk taking. More than one-third of our global population lives in poverty, earning less than two dollars a day. Governments, businesses, social enterprises, and charitable organizations have tried to solve the global poverty issue with mixed results. What is the solution? Is entrepreneurship the solution, part of the solution, or has no impact whatsoever? In this course, you will gain an understanding of the power of entrepreneurship (in the context of creativity and innovation), the definition and depth of global poverty (in the context of constraints, such as human, financial and physical resources embedded in local, regional, national and global cultures), and successes and failures of past initiatives to reduce poverty. This is not a course about politics or business, but rather finding a solution to a problem that has eluded mankind since the beginning of time.

Failing Successfully	SBS/Entrepreneurship	Did you know that at one time Netscape was the most popular internet browser? What about MySpace, arguably the Facebook of the last decade? What led Apple from being innovative pioneers of the 70's to the verge of extinction in the 90's to the technical giant that they are today? Technologies come and go, but what leads to organizations lasting more than 100 years such as IBM, General Electric, etc.? What role does failure play in successful innovation, decision making, and business viability? In this course, you will learn about innovation that may be successful and well-executed. You will also learn about innovation that was a viable business opportunity, but poorly executed: one phase of failure. In addition, you will learn about innovation that had no real market viability but was launched anyway: another phase of failure. Can failure lead to success? And if so, how?

Elements of Attraction: Supply and Demand	CAS/NESAD	The intent of this course is for students to examine and effectively express in writing their ideas on creativity and to inspire undergraduate students to exceed their current levels of learning. Students will learn to meaningfully integrate course content into long term-retained useful skills through applied creative collaborations. This course is based on the idea that exposure and insight development will enable students to better visualize themselves in their desired fields and make informed choices within the variety of options available to them. The focus of the course will help students to assess their personal interests and strengths as they plan for their own educational and professional futures.

Theater at Work	CAS/Theater	This course is an introduction to creative practice using theatrical improvisation as a problem solving tool. Specifically, students will be applying foundational skills that they have learned in the first half of the term to their work with students in the Boston school system after the midterm. Structured improvisations are at the heart of each class session and will be the primary tool to help students address core social issues they identify as important to them in a systematic and collaborative way. The preliminary theatre games and improvisations introduced in the first weeks of class are designed to build trust among the group and to empower individuals to give voice to their ever evolving responses to the complex social issues we will be exploring. Class work and home work are habitually and organically rooted in exercises designed to teach students tools that will help them be more creative in their everyday life, in their academic work and in their careers – whatever they may be. The course will encourage persistence and play; risk and research; divergent and expansive thinking; and mindful seeing and doing. The course also encourages students to embrace ambiguity and iterative processes, and the learning that comes from failed ideas and false starts on the path to important and meaningful discoveries.

Catastrophe Management: From 9/11 to The Boston Marathon Bombings	CAS/Physics	This course will introduce students to the exciting world of emergency management from the perspective of scientists who are often utilized as experts during both small scale adverse events and large scale catastrophes. Students will actively and creatively explore the psychological, economic, and medical dimensions of these events and participate in role play in the classroom and site visits. By the end of the course, students will have a keen appreciation of emergency planning and management on the local and national levels.
The Entrepreneur's Cocktail: Human Innovation, Creativity and Hard Work	SBS/Entrepreneurship	How do you and your story drive your business? This course takes an innovative look at Human Creativity and Entrepreneurship. As an entrepreneur needs perseverance and high motivation, we will explore the importance of values, risk taking, problem solving and the discovery of market opportunities. In order for you to be creative and essentially create successful ventures, you will discover the nuances between the three factors and explore them further thru interactive discussion and debate as well as collaborative group work. You will be encouraged to think in non-conforming ways and apply new concepts and develop your own personal operating principles.

Unblock Your Creative Nature	SBS/Dean's Office	What motivates your creative nature? This course will explore converging themes in Art and Psychology in order to give students the tools they need to unblock their creative potential. Collaborative small team activities, assigned readings, large group discussions, and personal reflection exercises will provide an avenue for students to explore their own creative patterns and how they are influenced by, and perceived within, the world around them. Dreams, mental illness and psychosocial theories of self will also be widely discussed in order to give students context for this inter/intrapersonal exploration.
Finding Your Creative Voice	CAS/English	Schools and workplaces are becoming increasingly demanding and competitive, relying on unique ideas to continue innovation. Where do fresh ideas come from? This class will provide students with the tools they need to find creativity within themselves, and set them apart in the competitive arena. Students will explore who they really are at their core, identify their innermost thoughts and feelings, and uncover their creative identity while having fun! They will also learn to communicate, or "share their creative voice" clearly and honestly.

Branding Your Visual Identity	CAS/Advertising	A brand may be a product, service, an organization, or a person, and at the core of every brand is a visual identity. A brand's visual identity is its strategically planned and purposeful presentation of itself. It is manifest in the brand's name, logo, tagline (slogan), color palette and other sensory elements (visual, aural, olfactory and tactile) that identity that brand and make it unique. This course will focus on analyzing the success and failure of brand's visual identities as a way of teaching students how to brainstorm and develop a new visual identity from concept through execution. The focus in this course will be on applying creative thinking to create a cohesive and meaningful visual identity.

Improv for Everyone Everywhere	CAS/Theater	Improv Comedy has become the cornerstone training of movies and television for the past 20 years. More recently, "Corporate America" has begun to recognize the importance of the skills improv teaches - agreement, listening, moving forward as a group and "out-of-the-box thinking." This course immerses students in improv theatre exercises to apply not for performance, but to shed light on how to collaborate with others. Students will be required to actively participate in exercises in class, experiencing the benefits and takeaways first-hand. Students will be able to connect these exercises with the theories of creativity presented in text books and use both to create a final presentation piece. By the end of the semester, students will understand how to recognize and foster creative thinking to solve problems leveraging the power of a group. Students will gain confidence with presenting new ideas and responding to other student's ideas, understanding how to create and maintain relationships as part of an ensemble that encourages and values ideas.

Train faculty on the Suffolk University CI Experience. The CI program holds two retreats throughout the academic year, with a focus on developing course content that is designed around the three core learning goals. In addition, the retreats present an opportunity for faculty to become comfortable with teaching iteration, a key component of the creative mindset. However, measuring the effectiveness of the CI program is not a priority. As such, determining the impact of CI courses on the creative mindset of first-year students does not exist. For creativity to play a more crucial role, "…an

approach to measuring it which is both rigorous enough to ensure credibility and user-friendly…" will assist in the importance of creativity   (Lucas, Claxton, & Spencer, 2014).

Evaluate learning outcomes. **Evaluate learning outcomes.** As the first graduating class approaches commencement in the 2018 Spring Semester, the Committee is addressing program evaluation designs to measure learning outcomes. Sources claim that there are over 250 methods of assessing the creativity of a person or personality (Oman, Turner, Wood, & Seepersad, 2013). Therefore, program evaluation is complicated. Faculty evaluations are performed by customized course evaluation instruments (CEI's) with questions related to creativity. CEI's are expected to change as the program evaluation process becomes more clearly defined.

Next Steps

As the Committee enters its transition to Suffolk University's Shared General Education Curriculum Committee (SGECC), there are some interesting opportunities that can be reviewed. First, the Committee needs to determine its relationship with the SGECC, as the CI course review and implementation processes are more far reaching, as all courses included in the program are unique. Second, the university may be able to collect its first data from the Class of 2018, as the first group of students to experience the Program. Next, the Committee can develop program evaluation designs and instruments, to assist the SGECC in fulfilling its oversight functions. Finally, the Committee can identify research opportunities, given the complexity and uniqueness of its flexible, multi-disciplinary curriculum model.

Summary

Creativity in society is important and an increasing phenomenon. Creativity curriculum in HEI's is expanding, but design, implementation and measurement gaps exist based on the ongoing debate between specific and general domains of creativity. Given the creative mindset diminishes with age, but more troubling, between the ages of five and eighteen, the pressure on HEI's to understand how creativity is transferred throughout curriculum, as well as understand how faculty perceive creativity in their fields, is crucial. As HEI's attempt to bridge the gap of receiving students from various K-12 curriculum and future employers. they are challenged by what tools can be used in a creativity program design. As HEI's become more interdisciplinary in nature, program design is further exacerbated by different disciplines. In other words, as HEI's are becoming more domain specific in curriculum, the alignment of related design, implementation and measurement introduces a degree of complexity.

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CHAPTER TWELVE

BEING IN THE PRESENT TO CREATE THE FUTURE: MINDFULNESS AS A KEY FOR UNLOCKING OUR CREATIVE POTENTIAL

CHRISTINE GALIB

for my mom and dad
who always encourage me to be compassionately curious
and who teach me to respect and marvel at the work of the ultimate Creator
&
for my students
who teach me something new each and every day:
may you always have the courage to never stop asking
 the tough, messy, painful, and immensely transformative
"Why?" and "But, what if…?" questions
&
for Stephanie Whittier, Dr. Marina Walne, and Gabriella Rowe
whose leadership inspires me to think different, always

"Our task today is to find singular ways to create the new things that will make the future not just different, but better – to go from 0 to 1. The essential first step is to think for yourself. Only by seeing the world anew…can we both re-create it and preserve it for the future." – Peter Thiel, *Zero to One*

ABSTRACT As educational leaders, we practice and promote the interplay of creativity, innovation, and wellbeing as we prepare students for success in the 21st century, global economy. What is this interplay, how does it manifest in schools, and how does it affect academic, personal, and professional outcomes for students as they self-actualize, reach their fullest potentials, and create their futures? This chapter examines the interplay among mindfulness, creativity, and wellness. Through reflections from the Head of School of, and students and faculty members at, The Village School, this chapter suggests how to create a culture of wellness, creativity, and innovation in school settings—and the importance of creating this culture. These reflections address the following questions:

1.   What is mindfulness? What is your mindfulness practice? Why is this practice important?

2. If mindfulness prompts authentic, curious, and nonjudgmental self-exploration, self-awareness, and self-actualization, how do these characteristics strengthen self-identity, resilience, and creativity, and ability to identify and execute independent and collaborative thinking skills?

The Village School is a private, coeducational, non-denominational, and international preK-12th grade school in Houston, TX.

Keywords: mindfulness, creativity, school culture, self-actualization, future-focused learning

> Our task today is to find singular ways to create the new things that will make the future not just different, but better – to go from 0 to 1. The essential first step is to think for yourself. Only by seeing the world anew…can we both re-create it and preserve it for the future.
> – Peter Thiel, *Zero to One*

> "In the beginner's mind, there are many possibilities, but in the expert's there are few." Beginners come to new experiences not knowing so much and therefore open. This openness is very creative. It is an innate characteristic of the mind. The trick is never to lose it. That would require you stay in the ever-emerging wonder of the present moment, which is always fresh.
> – Jon Kabat-Zinn, *Mindfulness for Beginners*

One summer day in Philadelphia, I found myself sitting in a student's desk, listening to a presentation. I was a Teach For America Corps Member, and Summer Institute—"teacher bootcamp" designed to take us from zero to sixty in six seconds as we prepared for our First Day in the classroom – was required. Barely a week prior, I would have found myself sitting in my office desk, watching the equity and bond markets, as an investment

management analyst. Wall Street was worlds away. With each day, my new adventure teaching science, health, and wellness at Boys' Latin of Philadelphia Charter School was more of a reality. During Institute, I distinctly remember hearing Teach For America's vision: "One day, all children in this nation will have the opportunity to attain an excellent education" (Teach For America, 2017, para. 4). As I'm sure you might be doing right now, I wondered: *But, what is an excellent education?*

In reflecting on this question, I thought of my Teach For America application essay. I explained my desire to facilitate my students' love of learning, for learning's sake, and pursuit of intellectual curiosity, for curiosity's sake, by sharing my experiences working on Wall Street and starting my own health and wellness business. I wanted my students to always strive to be independent, curious life-long learners and to never lose their sense of wonder. I started my essay with one of my favorite quotations: "The unexamined life is not worth living." Here, Socrates emphasizes the importance of intellectual curiosity and asking questions for creating a purposeful life. An excellent education enables, permits, and inspires learners to examine themselves and their world: to discover who they are and what their fullest potential is for innovating their world. An excellent education provides safe and supportive spaces and collaborative communities for learners to explore their own intellectual curiosity process—as messy, painful, and transformative as it may be. An excellent education inspires learners to drive their own intellectual curiosity process by asking "Why?" or "But, what if…?" and gives learners access to tools to tackle these questions. In doing so, learners develop their fullest potential while creating purposeful, needs-based, and sustainable innovations: they do well by doing good and immensely transform not only themselves, but also our world.

I looked around the room at peers: whether we came from college or careers, our journeys collided in this classroom. We sat in the same desks where, in just a few short months, a new generation of learners would sit. In that moment, I knew what was at stake for this generation was far more than earning good grades, participating in clubs or sports, and making new friends. What was at stake for this generation of learners was how they would identify, develop, and apply their own unique talents and wonderings to creating a future that was not just different, but better. And, what was at stake for us, as educational leaders, was far more than teaching the "perfect" lesson, integrating technology in our activities, and grading assignments. What was at stake for us was how we would acknowledge, validate, and nurture our students as they developed their fullest potential.

In our classrooms, our journeys collide with our students' journeys—for the briefest and most transformative moments. In those moments, how can we, as learners of all ages, co-create a community in which we examine and apply the tools in our toolbox to doing well by doing good? In our age of technology and easily accessible information, in which anywhere on—and off—our planet, is a few keystrokes away, what skills are necessary to

verify and analyze this information, and apply it to creating a better future? *What do you see when you picture our world—ten, twenty, or one hundred years from now?* More importantly: *What do you imagine*?

> *Nosce te ipsum* (know thyself)
> − Latin translation of the Greek maxim from the Temple of Apollo at Delphi
>
> "Curiouser and curiouser!" cried Alice (she was so much surprised, that for the moment, she quite forgot how to speak good English).
> − Lewis Carroll, *Alice's Adventures in Wonderland*
>
> A connection to our inner selves and our stream of consciousness is undeniably what makes us creative.
> − Scott Barry Kaufman & Carolyn Gregorie, *Wired to Create*

NASA is not too far away from The Village School. When I am not teaching, I love going to the Space Center Houston. On a recent trip, I saw a plant growth chamber with purple plastic folds, like the ones in an accordion, and LEDs that are adjusted as the plant grows (Figure 1, page 342). Designed by ORBITEC to grow vegetables in space, this chamber, called Veggie, is a product developed from combined expertise across, and collaboration among, disciplines including: art, biology, design, ecology, engineering, environmental science, physics, and thermodynamics. Veggie is a design-thought solution to tackle a twenty-first century challenge.

While a plant growth chamber may not be a crystal ball, it does help us see trends and identify skills that are crucial in the twenty-first century and beyond: observing our environment with appreciation, compassionate curiosity, and purpose; thinking independently, systemically, and collaboratively, in ways that integrate information among disciplines and systems; and applying our creativity to innovating products and processes. Veggie is the result of brainstorming and creative problem solving that took an idea from a figment of the imagination to a product that far outlasts the "light bulb moment" of inspiration. Questions drive the process of innovation, or applying creativity to addressing needs in lasting, sustainable, and transformative ways:

- What are the underlying needs this product or process addresses?

- Why are these needs important, and to whom?
- Why is this product or process important?
- How does this product or process address these needs?
- What if these needs change?
- What is the step-by-step process needed to create this product?
- What knowledge and which people are involved in this process?
- What happens to the product if the environment changes?
- Who are the primary, secondary, tertiary, and quaternary users of this product or process?
- How do I know, and with what criteria do I verify, my answers to the above questions?

Growing food in space is a challenge of the twenty-first century and beyond, as are sustainably producing food for and nourishing over 7.5 billion people who call Earth their home. These challenges are ones of scale— spanning states, systems, and space; sustainability—impacting long-term needs given finite capital and resources; magnitude—involving large amounts of people; and messiness – having no clear, "right or wrong" answer. Beyond knowing what information to use, and how to use it, new ways of thinking are needed to tackle these complex challenges. "All real change is grounded in new ways of thinking and perceiving. As Einstein said, 'We can't solve problems by using the same kind of thinking we used when we created them'" (Senge, Smith, Kruschwitz, Laur, & Schley, 2010, p. 10). Solving twenty-first century problems requires systems thinking, which "has particular importance, given the systemic complexity of the gravest problems facing humanity in the twenty-first century" (Buckle Henning & Chen, 2012, p. 470). Systems thinking combines observation, independent and collaborative thought, and integration of information among disciplines. It helps us understand how sub-surface complexities influence structures, patterns, and observable events (see Goodman's Iceberg Model, 1997, p. 7, Figure 2, page 342) and how networks operate. It helps us identify interconnections and relationships among seemingly unrelated events and notice how information flows create our twenty-first century "reality [of] interacting problems [or] 'messes'" (Ackoff & Greenberg, 2008, p. 27). It is crucial to creating purposeful, needs-based, and sustainable innovation that makes our future not just different, but better:

> A sustainable world, too, will only be possible by thinking differently. With nature and not machines as their inspiration, today's innovators are showing how to create a different future by learning how to see the larger systems of which they are a part and to foster collaboration across every imaginable boundary. These core capabilities—seeing systems, collaborating across boundaries, and creating versus problem solving – form the underpinnings, and ultimately the tools and methods, for this shift in thinking. (Senge et al., 2010, p. 11)

Foundational to developing these skills is conscious awareness: awareness of self – a conscious knowledge of our own internal environment, traits, proclivities, dislikes, strengths, growth areas, emotions, feelings, and thoughts – and awareness of others – a conscious knowledge of our own external environment's and others', traits, proclivities, dislikes, strengths, growth areas, emotions, feelings, and thoughts. The more we practice conscious awareness, the more robust our knowledge of ourselves and others becomes, the more we develop a deeper, authentic understanding of our fullest potential while creating purposeful, needs-based, and sustainable innovations and doing well by doing good.

We discover and cultivate this conscious awareness through mindfulness, or "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally" (Kabat-Zinn, 2013, p. xxvii). Mindfulness facilitates the process of being present: it is a lens (Kabat-Zinn, 2013, p. 13) that helps us focus so we can see our thoughts and feelings more clearly. "Just being aware of the mind that thinks it knows all the time is a major step toward learning how to see through your opinions and perceive things as they actually are" (Kabat-Zinn, 2013, p. 13).

Perceiving things as they actually are helps us observe our, and our communities', physical, emotional, and social needs: we discover our, and others', genuine strengths and skills, authentic weaknesses and blind spots, non-negotiable values, and underlying needs. With mindfulness, we create the space to think outside of our routines, assumptions, and systems that structure our thoughts and actions. We identify our habits, and with this awareness, determine whether they empower us, moving us closer to our fullest potential, or hurt us, ensnaring us in actions that hinder wellbeing. With this knowledge, we empower ourselves to create a new, more intentional vision and action plan. We identify our own learning and personal mastery processes, and understand how to develop them in the context of our communities. With this metacognitive awareness, we more purposefully diagnose problems (Heifetz, Linsky, & Grashow, 2009, p. 6); think independently, systemically, and collaboratively, and act as sustainable change leaders who "continually reflect upon the system [we seek] to change" (Senge et al., 2010, p. 238). As we pursue personal development and mastery, we increase our productivity: a senior partner at McKinsey reports that "change processes which include the dimension of personal mastery can lead to overcoming significant performance thresholds…not only for individuals, but for the team as a whole" (Scharmer, 2016, p. 88).

With nonjudgmental, conscious awareness, and continuous reflection, we see ourselves – and our – differently. We see how each moment in the present builds from moments in the past and informs moments in the future: we see "the present systemically [as we create] the future" (Senge et al., 2010, p. 51). More importantly than seeing our world differently, we *sense* our world differently. As we acknowledge the thoughts, feelings, and perspectives of ourselves and others, we develop an emotional intelligence

(Goleman, 1995) that enables us to understand, reflect on, validate, espouse – or change – our mental models, or "internal pictures of how the world works" (Senge, 1992, p. 5). We listen more intentionally, establish more authentic relationships, and collaborate more effectively. This type of listening, which Scharmer (2016) calls "generative listening" (p. 12) "requires us to access our open heart and open will—our capacity to connect to the highest future possibility that wants to emerge" (Scharmer, 2016, p. 12) and "[connects us] to a deeper source—to the source of who [we] really are and to a sense of why [we] are here" (Scharmer, 2016, p. 13).

Thus, mindfulness is a foundation for wellness: authentic awareness and nurturing of one's own physical, emotional, and social needs, compassionate curiosity: kind and appreciative wonder towards self and others, creativity: curiously engaging imagination to generate new ideas, and innovation: purposeful, needs-based, and sustainable products and processes (Figure 3, page 343). By creating space for us to pause, recharge, and be present in the moment, and to see and sense our world differently, mindfulness is a key for unlocking our creative potential. The present becomes an inspired moment of endless possibility that links the authored, established past to the imagined, emerging future. This "light bulb moment" of inspiration is foundational to transformative innovation (Figure 4, page 343). So, much like Alice is surprised by her own curiosity and invents her own grammar rules to create new words, perhaps we, surprised by our own curiosity, invent our own rules that do not limit our potential to create new innovations in our world.

> The principal goal of education... should be creating men and women who are capable of doing new things, not simply repeating what other generations have done; men and women who are creative, inventive and discoverers, who can be critical and verify, and not accept, everything they are offered.
> – Jean Piaget, as cited by Russell L. Ackoff & Daniel Greenberg in *Turning Learning Right Side Up*

> Nothing will happen unless you and your team have a clear sense of the importance of what you are doing, even if all you begin

with is a broad, high-level vi-
sion.
– Peter Senge, Bryan Smith,
Nina Kruschiwitz, Joe Laur, &
Sara Schley, *The Necessary Rev-
olution*

If you are working on something
exciting that you really care
about, you don't have to be
pushed. The vision pulls you.
– Steve Jobs

Before we can invent new rules, we need to learn the existing ones. A school provides not only a physically safe learning environment to do so, but also a community that encourages us to explore our creative wonderings in safe, unrestrained, and purposeful ways. A school must link the classroom to the real word: it must have "infrastructures that facilitate a shared seeing and sense-making of what is actually going on in the larger surrounding eco-system (co-sensing)" (Scharmer, 2016, p. 45). A school must be a lab that espouses a culture of wellness, creativity, and innovation, where students, teachers, and learners of all ages feel compassionately curious, comfortable taking risks, and failing forward as we pursue self-exploration. "Schools must also have "cocoons of deep reflection and silence that facilitate deep listening and connection to the source of authentic presence and creativity, both individually and collectively (co-presencing)" (Scharmer, 2016, p. 45). A school must be a space where we integrate information across disciplines and systems, collaborate across boundaries, and apply our creativity – not only to completing papers or designing lessons, but also to solving real-world, community-based challenges. A school must have the "infrastructures for hands-on prototyping…to explore the future by doing (co-creating)" (Scharmer, 2016, p. 45).

How do we design these types of learning environments and create this type of culture? It starts with a strong and intentional vision articulated clearly by leadership. This vision empowers students to love learning for the sake of learning, pursue intellectual curiosity, and connect ideas among disciplines. It also empowers teachers to inspire students with their passion for, and expertise in, their subject, and leverage their ability to connect new knowledge to students' everyday experiences. Classroom management is integral to creating a culture of wellness, creativity, and innovation. In your schools, how does each teacher's classroom management promote this culture? How does each classroom function as an incubator of ideas to create the overall culture of your school? Trust, and open and authentic communication, are central to my classroom management: I trust my students and treat them as the young adults they are. As one of my students told me during our monthly conference: "You treat us like you are the manager and we are on

your team. This makes me want to learn more and explore my ideas, even if they fail." Creating a classroom environment in which students feel comfortable taking risks, exploring new concepts, and making "errors of commission" (Ackoff & Greenberg, 2008, p. 74) promotes a school culture of wellness, creativity, and innovation – in which exploration of creative wonderings is valued. School culture – the thoughts, mindsets, and actions of a school's community members – ultimately reflects the vision articulated by leadership.

Earlier this year, I sat down with Gabriella Rowe, Head of School at The Village School, to discuss creating a culture of wellness, creativity, and innovation. As a third generation educator with over twenty years of experience, Gabriella is an exceptional leader who brings "a unique, personal blend of poetry, passion, conviction, and courage to articulating a vision" (Bolman & Deal, 2008, p. 48). One of Gabriella's many strengths is creating and communicating an intentional, clear, and future-focused vision. In doing so, she not only introduces originality into Village culture, but also creates a culture that unleashes originality in individuals at Village (Grant, 2017, p. 209). Here are ten takeaways from our conversation:

- ***Creativity and innovation by themselves are meaningless, if they don't have a purpose.*** Unless creativity and innovation are tied to a greater set of outcomes in the context of a community with a shared purpose, both are finite and discrete. Change for the sake of change causes confusion, isolates people, and detracts from the vision's importance. Change must be accomplished in healthy, positive, and productive ways – so it leverages, rather than damages, peoples' motivation and connectedness to culture. As educators, we must have a vision: an idea of what changes are needed, and why and how to make and sustain them. Our vision reminds us to ask and answer: "Why am I doing this?" Having creative ideas for change is a first step, but it is not enough. The next step is tying these ideas to our organization's larger purpose. Then, this creativity drives purposeful innovation that does not just solve an immediate need, but instead prompts us to see beyond the immediate need to imagine a new situation entirely.

- ***Create dialogue around the challenges, setbacks, and sacrifices. These are crucial for the process of innovation. They anchor the vision in a sense of purpose and drive the intensity of the vision.*** When we discuss creative, innovative, and transformational leaders, we tend to talk about what they accomplished – the "big idea" that made them household names. What we don't talk about is what their lives were like when they were anonymous, the number of the times they were rejected or told their idea was too radical, or the

sacrifices they made. A recent New York Times Magazine article featured the story of Arunachalam Murugananthama, the man who developed sanitary napkins in India. This created not only tangible health and wellness improvements in the lives of women in India, but also jobs, women's empowerment, and an economic transformation that spread to more than a dozen developing countries. The success story and the happy ending happened, but not without the humiliation, scar tissue, and the price that was paid over these years, including Murugananthama's wife leaving him during these years. What kept Murugananthama going through these challenges, setbacks, and sacrifices was the image of the pile of bloodstained rags in the outhouse. This image, which Murugananthama had noticed as a teenager, displayed the price Murugananthama's sisters and female family members paid to take care of their health. This image displayed the extent of human need and anchored his understanding of why Murugananthama felt so passionate about his work: he knew what he sought to accomplish was more important than the challenges, setbacks, and sacrifices he encountered. His innovation was not about his ego, fame, or fortune: he had a vision for how he wanted to impact the world, and his vision pulled him forward. His story epitomizes the messiness, pain, and immense capacity for transformation that drive creativity and innovation.

- ***Be comfortable with creativity and innovation as immensely messy, painful, and transformational, processes.*** As educators, we must be comfortable allowing students to "get messy" in the processes of creativity and innovation. We do this by continuously asking ourselves the "Why?" questions: "Why am I doing or learning this?" or "Why is this unit an essential part of our curriculum?" If the answer is "It always has been this way," or "This person said so," then perhaps we need to re-evaluate and change our actions. These questions are inherently messy, and we must give students and teachers frameworks to tackle them. These frameworks not only provide knowledge, skills, and encouragement, but also promote an understanding of the realism that is necessary to withstand the messiness and pain embedded in the processes of creativity and innovation. In many ways, these processes are similar to the metamorphosis process a caterpillar undergoes to become a butterfly. There is nothing about the metamorphosis process that is beautiful: it is messy and

painful to the maximum. But, this process gets us to that moment where transformation occurs. The caterpillar emerges as a butterfly, and the butterfly can fly. That is the ultimate end result. That is what makes the process brilliant.

- ***Take the time to identify and reflect on the needs affecting your organization's community, then unleash your creativity to address those needs.*** Arunachalam Muruganathama zeroed in on the physical and tangible human need he saw in his community. This takes us back to Maslow's Hierarchy of Needs, and the needs at the bottom of the pyramid, which must be met before self-actualizing. As educational leaders, we must be aware of, and comfortable talking about, the specific, diverse, and dynamic needs of our students and faculty. We operate in a school – a living laboratory in which we help each other recognize and address these needs. We don't just sit in a bubble, create curricula, and hope our lessons will come to life somehow. We shouldn't; they won't. A school should be a place where recognizing, reflecting on, and addressing needs are ongoing, everyday experiences for community members. Bringing Wellness to Village was a direct response to a community need. We have the best teachers, beautiful facilities, and incredible educational experiences for our students. We constantly support students as they achieve their ambitions. But, we realized that we were not supporting our students in holistic ways as they encountered the by-products of achieving their ambitions. Students, especially our highest performing ones, were stressed out and exhausted. My first year at Village, I was called to an exam room because a student had passed out from exhaustion. That was the moment of transformation for me: that was the answer to my "Why?" question. We brought mindfulness and stress management to Village to create a culture of wellness to support our students' needs.

- ***We must educate children for their futures – not for our pasts.*** Education is not just about creating the doctors, lawyers, bankers, and engineers of the future. It's about helping our children transform themselves into the most effective adults – physiologically, emotionally, and intellectually – they can be. To do this, we must actively bridge the gap between the classroom and the real world. If education occurs in an ivory tower that is utterly disconnected from

the real world, it is very difficult for education to be purposeful. While our children are in school, we must provide opportunities for them to impact the world beyond the walls of their classrooms: to solve real-world problems involving wellness and sustainability, to be metacognitive and mindful, and to assess their own existence and ask questions about their own futures. In constructing their answers, students develop their own processes of transformation and pick their own paths forward. As educators, we are facilitators who nourish our students at each developmental stage. We ensure students have the tools of creativity, critical thinking, and collaboration in their toolbox, so that when their transformation occurs, they are prepared to make the best possible transformation. With these tools, our children create their own future in which they have a strong sense of ownership, value, and purpose.

- ***We must educate students for the "twenty-first century success paradigm."*** As educators, we are with our students for such a small part of their existence – their incubation period. Where they fly to, and what they do when they leave us, stems from their understanding of how they see themselves as change agents in their world. The education we provide is not about the time our students spend inside a classroom. It's about how that time impacts them for the rest of their lives and how this bedrock provides a foundation for their future – the future they create. We must keep bringing the mentalities of wellness, creativity, and innovation to what is traditionally a creative field: every day, we ask students and faculty to test new skills, to apply new concepts, and to create new ideas based on real-world application of knowledge. As we rethink what education and success look like in the twenty-first century, we must keep coming back to the intersections of wellness, creativity, and innovation in answering the "Why" question: "Why are we educating our students, and for what purpose?" We all know people who are doing a lot of work that they neither enjoy, nor find particularly purposeful. This results in unhealthy habits – a lack of mindfulness, wellness, creativity, and innovation – that hinder individuals from giving their best innovative selves to their clients and themselves. These individuals aren't giving the best of themselves; they aren't getting the best of themselves. I remember an expression from my Wall Street days: "You don't leave until you go out feet first." A lot of young people work

until they collapse, because they keep chasing that "end." They were promised a pot of gold at the end of the rainbow. They were told their work was for the greater good. But in the day-to-day, the pot of gold and greater good were never attainable. Yet, they kept working anyway, until they burned out. We need to shift the paradigm for what success in the twenty-first century looks like. We need to ensure our students are prepared to create their own success, no matter what professional interests are. What jobs will our students have – or create? What are the knowledge and skills necessary for those jobs? A doctor using virtual reality to operate? A nano-physicist? A robot-ethicist? A farmer…on Mars?

- ***It takes a village: mindfulness, wellness, creativity, and innovation must be collaborative, and individual, efforts.*** It is difficult, and not sustainable, to lead change by yourself. If you are the only one supporting yourself, accomplishing your vision will be much harder. You must tie your vision back to the "Why" question. As you answer this question and execute the vision, you must ensure it makes sense programmatically in your community. If a staff member or parent suggests an idea, reflect on how that idea impacts a community need, aligns with the vision, and makes sense programmatically. Dialogue with individuals to facilitate your reflections: Dr. Marina Walne was a key individual in my own reflection process. That was our strategy for Wellness at Village. We built the framework to support wellness in programmatic ways, so that our transformation could be more purposeful, needs-based, and sustainable. We wanted to think beyond the moment of crisis. By focusing on proactive skill building, we addressed the underlying, systemic need. We integrated a more sustainable solution for our culture, so the issue was less likely to re-occur. We kept coming back to the "Why." Our students cannot be the best possible humans they can be if they are not aware and actively taking care of their basic physical, emotional, and social needs. If our students are not assimilating coping methods, learning how to negotiate challenging relationships, exploring their creativity, and testing their innovations, they put themselves at a disadvantage for succeeding. That makes mindfulness, wellness, creativity, and innovation critical parts of their education, like learning how to read, practicing math skills, and understanding history. As educational leaders, we must make mindfulness, wellness, crea-

tivity, and innovation essential parts of our own curricula, weaving each in as strands that tie our content together. That's our own personal transformation: engaging in our own personal metamorphosis – as messy and painful as it may be – and showing students our willingness to do so.

- ***To create cultures of wellness and creativity, and to innovate intentionally, organizations must reflect often on themselves, their mission, and their vision.*** Organizations, particularly ones in education, seeking to create a culture of wellness, creativity, and innovation, must do so in sustainable and mindful ways. As organizations, we must reflect on our own cultures, systems, and challenges. We must read, re-read, and re-read our mission statement – and rewrite it if needed. At Village, we recently re-read our mission statement. We changed one word: "school" to "community." This changed the feel of our culture. Organizations must ask the tough, messy, and painful questions such as: "What are our challenges and why?" It is easy to get caught up in the reality that there will never be enough funding, time, or internal resources to do it all. There will always be naysayers and individuals who fear change. Ignorance will always confront an organization's vision. There will always be challenges, setbacks, and sacrifices. In the face of all these, our greatest defense is returning to the "Why?" question: "Why are we making this change?" What drove the vision for bringing Wellness to Village was the "Why?": a student collapsing during an exam. It was not about pushing religion or adopting the fad *du jour*. It was about health and wellness. It was about Maslow's Hierarchy, and ensuring our students could access safety, security, and tools to build a strong personal foundation, so they could develop their fullest potential and achieve their ambitions in healthy ways. In education, our legacy is almost boundless if we are purposeful as we change. Fundamental to our legacy is the intersection of wellness, creativity, and innovation. We have to discuss and promote this intersection. If we don't, we not only do a huge disservice to our children, but also miss a huge opportunity to impact the transformational course of history and the future. As educators, we can shift that path materially, and widen it for future generations. If we don't act now, we narrow that path and provide fewer of the tools our children need to create their future. We shut down the path of education itself.

- ***Schools are multi-generational organizations. How will your school continue to create impact in a century, two centuries, or three centuries?*** A school serves many generations. Some of the most gratifying moments in our lives are seeing how a school impacts families. Both my mother and grandfather have experienced students coming back for years and years. When my grandfather passed away, we had a celebration of his life. We received hundreds of letters, and people flew in from all over the country to share memories. One woman in particular attended. She has muscular dystrophy. Forty years ago, in a time when legislation did not exist, my grandfather lobbied for funding to get her into schools so her needs could be met. He was running our school, and took the time off to testify on her behalf, go to court with her, and make sure she got what she needed to obtain her education. My grandfather's efforts changed the path of her life. Her path took her to California, where she went into social work in schools. She dedicated the rest of her career to advocating for students. She said without the model my grandfather provided for her, she would have never made those choices in her own life. She and her work have impacted hundreds, if not thousands, of children whose lives would have been so different if she hadn't advocated for them. That's the potential of education: to change the path of one's life completely.

- ***Lead by example.*** The last thought is the obvious one, but it's also one we tend to forget. As transformational leaders creating a culture of wellness, creativity, and innovation, we must remember to do that good, old-fashioned thing called leading by example. We must model transformation and evolve our own beliefs and actions as we create this culture. Just as we must provide opportunities in our schools and in our lives for others to evolve and transform, so too we must seek these opportunities in our own lives. We are evolving and transforming too, and these are very healthy processes. In our schools, we must make space for self-inquiry and self-reflection, as we continue to develop our own capabilities and potential. As we incorporate traditional processes, like staff appraisals, we must include ourselves in those processes, too. Everything ties back to the "Why" question, to the purpose of wellness, creativity, and innovation. We are never too old to learn, and to adjust and readjust the paradigm of success that was set for us. That paradigm has changed

dramatically in the last decade, and we can only benefit from it by making it part of our own "adult" world, too. In doing so, we model that it's okay – more than okay, it's necessary – to continuously reflect and readjust. That's creativity in action. That's how innovation works.

> The situation would be greatly improved in an education system that granted freedom to all students, of every age, to follow their own unique path toward understanding, and to seek on their own initiative the intellectual tools they find more congenial to help them along that path.
> – Russell L. Ackoff & Daniel Greenberg, *Turning Learning Right Side Up*

> Develop and hone the skills for getting to know yourself.
> – Michael Fullan, *Change Leader*

> Issues of health are seen as the raw material for a journey of personal development and inner cultivation. They invite us to access the full potential of our inner sources of creativity, to embark on a journey to who we really are. "I am somebody who never got sick," a woman told us. "And then all of a sudden I had cancer…I worked hard, I was a member of various committees, and I just ignored the fact that I was sick…I told myself: just ignore it. I went back to work full-time, with the result that two years later I had a breakdown. I was forced to stop working. Afterward, after surgery, I went to therapy and I learned to talk about my dis-

ease…You know, I only learned at the age of fifty-eight to say 'no.' Before, I was always ready to go, I always functioned. I didn't even realize that I had lost my identity on the way down. And now I am not concerned about my future anymore. Today's important to me. *Now.*
– C. Otto Scharmer, *Theory U: Leading from the Future as it Emerges (2nd ed.)*

I asked several of my Village students and colleagues to share their reflections on mindfulness, wellness, creativity, and innovation. Each reflection is presented as a stand-alone piece to preserve each individual's narrative.
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Mindfulness is the state of being mentally present where your body is physically present; it describes the idea of being aware of your surroundings, being mindful of the reality that is physically around you.
– Fernanda Nunes, Village Alumna, Class of 2017

I was introduced to mindfulness during the most stressful period of my life: first semester of my junior year. Back then, all I wanted was to live for myself and to spend more time with my family and friends. I dreamed about opening my own business. Instead, all I did was study, sleep, and run cross-country. I was in a helpless state of mind of constantly trying to get things done. I was unable to relax for a half second because I felt that if I did, I was failing. During classes, instead of paying attention to the material, I would do homework because it made me feel like I was actually getting something done. After school, I went home and reviewed academic material non-stop for at least three hours, giving myself no time to do any of the non-academic things I wanted to do. I quickly ate dinner while studying instead of sitting down and enjoying a nice and slow meal with my parents. I woke up early for practice. While running, I only thought of what to do next – constantly feeling that I was already behind because I never had enough time. When I accomplished great things, I didn't appreciate how well I did, but instead quickly got over my achievement and set another future goal to achieve. I was never present in the "now." This caused me to become con-

stantly stressed, easily frustrated, and mentally tired.

I was not pleased when I found out my school implemented a required Mindfulness class for full International Baccalaureate Diploma students. I could not understand why the school would force me to spend time meditating when I had SAT practice, chemistry homework, extended essay proposals, physics worksheets, economic review, and math problems. I was angry, but I swallowed my frustration and walked into mindfulness class with a fake smile placed on my face. During the first few classes, I sat in the back of the room so I could do homework without being caught. This system worked pretty well, until the day we discussed multitasking. Ms. Galib explained how multitasking creates inefficiency as our attention is never fully on one thing, but instead divided over several actions. She stated that multitasking is not a mindful way of completing a task. We discussed how it is much better to engage your mind completely in one topic, preferably in something that you are physically present in, as it enables full brain activity and focus. Through that lesson, I realized that my habits were not allowing me to perform to my fullest potential, as I was rarely fully engaged in one activity.

I then began working on focusing my mind where my body was. In chemistry class, I paid attention and worked only on chemistry. During my cross-country races, I thought about the race itself, rather than what I would do when I got home. In mindfulness class, I no longer did homework, but instead used class as a period to calm down and learn about topics that were not commonly taught elsewhere. This new habit began a chain of events that changed my life. Academically, paying attention in class allowed me to understand the material better and quicker. I spent much less time reviewing at home. Instead of studying during all my free time, I could now read interesting books, cook, spend time with my family and friends, and play my guitar. All these non-academic activities allowed me to de-stress, release frustration, and recharge my mind. By paying more attention to my present, I also began taking life more slowly. I realized that I am only human and therefore do not need to achieve everything perfectly. I became more accepting of my errors and managed them without getting frustrated at myself. I suddenly felt more alive and present in my body than I had ever been before.

The best outcome from being mindful has definitely been the unordinary things I have been able to do with my free time. I finally began my business selling energy bars and breakfast bowls. My business has taught me a lot about the real world, which I would have never learned by sitting in class, and has also enabled me to grow as a person. It has been a source of happiness and growth that would have never happened if I hadn't become more mindful about how I was living. I am now a young adult, headed to college, who feels prepared for what the future holds. Each day, I no longer wake up feeling like I'm running out of time. Instead, I wake up and smile about the exciting twenty-four hours I have ahead of me. I'm thankful to my experience in Mindfulness and will carry these learnings forever.

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Mindfulness is being aware of the things that are happening around me. Mindfulness is living in the present, being in the moment, and engaging in whatever is happening. Mindfulness is also having complete concentration on whatever the present task is. Mindfulness is not being distracted by different thoughts or concerns from the past or the future. Mindfulness is also being able to analyze a situation in a thoughtful manner.
– Oliver Phan, Village Alumnus, Class of 2017

My mindfulness practices include working out, playing instruments, reading, and meditating. These activities force me to concentrate to be 100% efficient. When at the gym, my main distractions are the people, their conversations, and what I imagine they are thinking. These distractions and unrealistic thoughts affect my workouts by decreasing my efficiency, since I start wondering what others think of me. With mindfulness, I learned to push these thoughts out and stay focused on my routine and each exercise. By becoming more aware and focused, I reduced my workout time significantly and increased the overall intensity. Working out with a goal helps me become more aware of what, and how much, I eat. I became more mindful through a simple task of going to the gym five days a week.

Playing any musical instrument helps me to be mindful. To complete a piece, I have to pay attention to how my instrument sounds and to the smallest details of the way I play. The slightest errors in my playing can be fixed if I was being mindful and paid close attention to them. I play music to clear my head, to entertain myself, and to stay focused. After practicing the piano, I get a "light-headed" feeling, which helps me concentrate on my other work.

Reading is another of my leisure activities that is part of my mindfulness practice. When I read, I realize how much I do not know about the world. Reading also helps me realize the potential that I have. I treasure the knowledge in each page.

Meditation is another one of my essential mindfulness activities. For me, meditation has the same effect as playing music: it clears my mind and makes me "light-headed." By practicing purposefully focusing on my breath, which seems a lot harder than it sounds, I become more focused on my tasks during the day at school, in the gym, and anywhere.

These practices help me stay focused, live in the present, and be mindful of what is happening around me. I notice the things I would usually

not have noticed if my mind were to wonder somewhere in the past or the future. I appreciate what is around me more, instead of thinking about what I could have had or will have. My productivity also improves by practicing my concentration through mindfulness.
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> *When there is mindfulness, one can achieve a union of the mind, body, and soul.*
> – Aditi Chunduru, Village Alumna, Class of 2017

  Mindfulness is awareness. It is the practice of noticing and understanding how changes in environment affect the state of your mind and body. To be mindful is to take actions that benefit both your mind and body. There are many aspects of mindfulness. In one sense, mindfulness is ensuring you are physically living a healthy life by practicing healthy eating and exercise habits. In another sense, mindfulness is ensuring your mind is healthy by filtering out negative thoughts, calming your mind, and permitting your mind to rest.

  Physical mindfulness practices (playing a sport, dancing, or healthy eating) can aid us in becoming more productive individuals. When you are aware of your mind and body, you take actions to ensure that both are getting the nourishment and rest needed to succeed physically. Once your mind's and body's needs are met, your quality of living also increases, as you are now able to pay attention to detail as a result of increased ability to focus.

  Mindfulness practices in the mental sense, be they meditation, yoga, or perhaps even singing, can help us form relationships, ideas, and connections that reach beyond the surface level. Once the basic needs of your body are taken care of, your brain and mind now have the time and energy to question things beyond the ordinary. Mindfulness practices for the mind can lead to innovation and creativity. Practices such as meditation help to increase clarity in our thoughts and in our mind as serves as a means of deep, peaceful rest.

  My mindfulness practice entails a combination of various physical and mental practices. To be mindful of my body's health, I dance for about half an hour each day. It is extremely important not only to keep my body fit and serve as a means of exercise, but also to enable my mind to be present in the moment – free of thoughts from the past or about the future. When dancing, my mind is not in the past or the future, but in the present. The constant movement and attention to detail prevents my mind from overthinking or overanalyzing. Dancing serves as a mental break and a physical workout. Dancing provides me a means to escape the world; one might say this can also be considered meditation.

  My mental mindfulness practice involves meditation and a breathing technique, I learnt through the Art of Living foundation called Sudarshan

Kriya. Sudarshan Kriya is a breathing technique scientifically proven to have numerous health benefits such as enhancing the immune system, providing deep rest, and relief from depression. Apart from their numerous health benefits, meditation and Sudarshan Kriya often alleviate a majority of the tension I carry, as both are a means to release emotions and increase my clarity, perception, and awareness of my surroundings. Both have greatly increased my ability to focus on a specific task and enabled me to be far a more productive individual.

Mindfulness techniques (physical and mental) come in many forms. It is important that each individual creates his or her own practice tailor-made to his or her own needs and interests. I believe the key to being constantly mindful comes when we create habits out of our practices. Once these mindfulness practices become a part of our daily routine, we automatically become far more aware of our surroundings and their relation to our physical bodies and minds. Mindfulness practice is what helps us live in the present moment and take in each experience to the fullest. When there is mindfulness, one can achieve a union of the mind, body, and soul.
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> *The meditation allowed me to put my mind in a space between consciousness and unconsciousness; I was subconsciously aware of the fact that I was awake, but I was not thinking. My mind was kind of just blank for half an hour but it was honestly very relaxing because I didn't have any positive or negative thoughts in my mind. I just kind of existed.*
> – Natsumi Osborn, Village Alumna, Class of 2017

Last year when we did the body scan meditation in class, I remember the surprise and awe I felt at how relaxed I felt afterwards. When we did the scan this year, I wanted to focus more on the actual words of the body scan, and steer myself to be more aware of how the words affected my mind (rather than just zoning out immediately). I was especially looking to the scan to put my mind and body at ease, since I had a particularly busy week and felt so fatigued. I had headaches and felt worse than I usually do with no sleep – very dampened and without energy.

When Ms. Galib started to speak, I intentionally followed everything she said instead of accepting her voice as part of "background noise." I focused on each muscle or body part as we moved from the ankle, up the leg, up the torso, down the arms, into the fingers...What was most interesting were her instructions to relax our muscles and release tension. Especially when

we got to our upper body (shoulders, arms), I realized I actually was quite tense despite thinking I was comfortable. So I relaxed my muscles and felt better. I felt fine! I was not tense anymore…

But as we kept going, I realized how untrue that was. Later I realized my shoulders and arms were actually still tense. So I fixed it, and then I felt fine. But later again I realized I was still cramping my muscles in one way or another, and so I relaxed my body. I felt fine. This kept on going on and on. What was so interesting to me is how "fine" and "relaxed" I genuinely felt at the time. I think, since I was actively putting a solution to an immediate problem, I tricked my mind into thinking that the problem was fixed. I honestly thought I was fine, but the more I went on with the body scan, the more I realized how completely untrue that was…

What was most interesting is how I saw this apply to basically anything else in life. We constantly think that if we find a way to deal with a problem, the problem is immediately fixed. And then we subconsciously accept that we feel "fine." And that "fine" becomes the foundation for everything: it's where we start with and where we end up, whatever problems we face. BUT we are not always fine. In fact after this experience I'm pretty sure that more than half the time we only think we are fine. Even if we genuinely feel relaxed and happy in the moment, there are things that make us and our lives imperfect that are preventing us from being truly "okay." So that means we probably have a distorted understanding of ourselves in that we constantly think that we are 100% stable, emotionally and physically because why not? This struck me so hard when I realized it since even for myself there were some difficult points in my life that did not seem like a big deal at the time. I dealt with them and worked through them positively and didn't realize, as much as I do now, how NOT okay the situation was and how I was NOT fine since I was thinking positive. I now understand how large of an issue that is, how it slips into so many aspects of our lives, into problems that we don't realize we have until life slaps us in the face.

This whole "thinking I'm fine" thing was the first of the two big things I took away from the meditation. The second is the way I was able to sort through and temporarily forget my worries! About halfway into the meditation (I think), Ms. Galib told us to imagine us breathing away any stressors. Inhale with awareness of them, exhale to literally put them out of our bodies. I imagined all my deadlines lining up as books on a bookshelf. I listed the things I was worrying about – a scholarship deadline, music I needed to work on, an English paper – and mentally pictured each one. When I inhaled, I let my stress talk pour out: "I don't want to work on this, I'm so tired, I'm so exhausted, I still have so much to do, I don't know how to deal" and so on. When I exhaled, I imagined the "book" on the leftmost of the shelf raise off the ledge, and then fall out to the side, disappearing. What was most fascinating in this process was my mind's response to it. The first time I did it, I thought, "Omg! I am now not going to think about ____ anymore." Then I was too focused on clearing the second "book" off of the "shelf" so I actu-

ally did completely forget about it. After the first two or three, I basically forgot about each one. I truly felt at ease and much more comfortable as those pressing thoughts just disappeared.

When I was tapped on the shoulder to bring my focus back to reality (I must have been so immersed in this process that I stopped listening) I felt so much better than before. I didn't start stressing about school and music like I had before; in fact, I was at peace with the fact I had to deal with them. I felt much better the whole day and the meditation really did turn me upside down because I had started in such a tired, unhealthy space! And more than that, I came to realize the power of meditation – how easily we can work our minds to reduce stress…as long as we are aware of our stressors and how they impact us, we can deal with them effectively.

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> As struggles came and went, mindfulness has given me the confidence and reassurance that everything would turn out okay at the end, no matter the odds.
> – Valerie Reaza, Village Alumnus, Class of 2017

Before I encountered mindfulness, I had an overwhelming amount of confidence that no matter how hard things got, everything would turn out okay in the end. I found deadlines to not be as stressful as many of my peers found them to be, especially when those deadlines were for the following day. When I encountered mindfulness my junior year, I could put a name onto how I handled life. Our mindfulness class has allowed me to become more cognizant of my own body and environment. It taught me ways to handle things with a more holistic and present approach. Mindfulness has given me an immense sense of hope that as times change, things will work out. I think mindfulness gives us the confidence and adaptability to cope with the unforeseen future and changing times and thrive in a more technologically advanced society.

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> Moments…our entire life consists of moments…
> – Johanna Wendebourg, Village Alumna, Class of 2017

We Have Only Moments to Live
[an imagined dialogue between two friends, based on real conversations with multiple people]

"Moments…our entire life consists of moments. Moments of joy, pure happiness, luck, easiness, comfort, and love. And also moments of anger, tension,

sadness, stress, suffering…Am I not right? Is not our whole time on this earth just a puzzle of an incredible amount of moments? Some are big: they affect our lives greatly. They stay in our hearts or minds, or both, forever. Some are small: they just pass by. We barely even notice them as separate moments. We don't realize that they could easily be our last ones. We forget that in just one moment, our lives can change so drastically that afterwards we are simply surprised and confused, since there is no way we could have predicted what happened. We forget that in just one moment, our lives can change from negative to positive, from hate to love, from sadness to joy. We forget that in just one moment, our lives can change from good to bad, even from life to death."

"But how can we know if this moment is a big moment, one that affects our entire life? How can we know if this moment is our last?"

"We can't. We don't. We never know for sure."

But I understand that this is not the answer he wants to hear. "Have you ever tried yoga?"

I just get an amused look. "Do I look like a 40-year-old mom of three who wants to get back in shape, because she is frustrated when she cannot reach her toes anymore?"

Of course he doesn't. "So what about meditation?" I try again.

"Meditation? No thank you. Why would I?"

Yes, why would he? I expected this reaction. After all, meditation is for people who are completely stressed out, who have no idea how to handle their life, right? Maybe. But maybe not. Is not the whole idea behind meditation and yoga to bring awareness to yourself? To your mind, your thoughts, your body, and also to the environment and situation you live in. Maybe meditation helps us make sense of this puzzle of moments, since it allows us to take a step back and look at our lives, all those little and big moments in past and present that shape who we are. I tend to ask myself: How is it possible to live every moment to its fullest, as if it was our last, without getting lost? I want to live in the present. I want to enjoy the right now. I want to take in all those little and big moments that shape my life. But after all, I know we have to consider our future and plan our lives. As if the past and present moments all melt into one big picture, one, single, big Moment, that decides the rest of our lives. I know people often say: Don't get stuck in the past. Live on. Look forward. But what if, instead, we get stuck in the future? What if our fear of what the future might bring stops us from living in the moment? Sooner or later, we forget that we have only moments to live. I try to put my thoughts

into words. "Well, you see, there is more to meditation and yoga than commonly acknowledged."

"Oh yeah? Like what?" Again that amused look.

"Mindfulness" I say, though I know that term means nothing to him. "Clarity, consciousness, self-awareness…" I keep going, trying to explain what is going on in my mind, what seems to be the only way to understand the impact of moments.

"Meditation, you know, it allows you to stop for a while. You stop and just take in the moment you live in, without trying to change anything. Your mind and body just get to rest, because you become awake and aware from one moment to the next, without trying to fill up each moment with something. It is then that you realize how your mind works. You realize that your mind usually gets stuck in past or even future, forgetting about the present. You asked me: "How can we know if this is a big moment?" We don't. Not really. But we can try to understand the impact of every moment when we start being aware of each one of them. So maybe you don't have to be a 40-year-old mom of three to practice yoga. Maybe you don't have to be stressed out to meditate. I think that when you feel the need to understand your mind, your body, your own puzzle of moments, that's when you meditate. Have you ever thought about how much time you spend thinking about your past or future?"

He smiles and pulls out his phone. "So, yoga or meditation classes? I think before work makes most sense – it would be a good start in the day. Are you in?"
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> *I discovered that Mindfulness is a breather for the mind. It's not just a breath, not just one of those instinctual intakes of oxygen that we release as carbon dioxide, because mindfulness is not passive.*
> – Nadin Fallah, Village Alumna,
> Class of 2016

Mindfulness is one of those breathers that makes you feel revitalized and gives you control over every day. I began to notice that although we take in oxygen every minute of our lives, we often fail to really allow ourselves to breathe in the process. Mindfulness is so often downplayed as inessential – perhaps even odd. It is unfortunate that many of us have grown up so discon-

nected from ourselves and from our own surroundings that we have failed to realize the need to restart our minds, rather than just our laptops.

My journey with mindfulness has been marked by a series of small but important – even life-changing – revelations. I cannot even count the number of times I stress myself out, even now, just to stop for a minute and realize that my heart is beating fast and my breaths are quick and short. Taking a moment to slow down my breath instantly has a relieving effect, allowing me to soothe my body's reaction and approach the same task with a healthier mindset. The difference is quite shocking. Not only does my concentration improve, but my productivity increases and my concerns over workload are mitigated. The explanation for this was given me by Ms. Galib, who once shared with us that our body has the same stress reaction to facing a bear as it does to facing an exam, or any other stressful task. Our body is unable to distinguish whether stress is caused by a life-or-death situation or by a small hurdle. I remember being utterly astonished by this, quickly reexamining my behavior towards exams and assignments, and realizing how much damage I had been causing myself. It was at this point that I first understood the importance of mindfulness, both in our formative years and in our adult life.

As humans, we are naturally attracted to the idea of serenity and peace of mind. But, speaking from my own experience, I initially found mindfulness intimidating. I had built it up as something that required years of specialized training. What I found was I did not have to be a meditation guru to reap the benefits of this practice. This completely shattered the image I had been holding on to of what mindfulness was supposed to look like, and allowed me to discover a new way of being in tune with my mind and body. I came to learn that mindfulness could be practiced on a daily basis and on a small, but consistent, scale. I discovered mindfulness is about taking a moment to disconnect from all those outside pressures that weigh us down, and using that moment to reconnect with our needs and ourselves. Mindfulness is about changing our thought process to focus on what is really important for our wellbeing, rather than do ourselves harm by focusing on all the things that are not. Mindfulness is about being present; about paying attention; about perceiving the needs of our body with non-judgment. Mindfulness can even just be about disconnecting for a moment, closing our eyes, and focusing on our breath.

Mindfulness is so simple that it is actually quite difficult, especially in a world dominated by social media. We have become so accustomed to looking at our surroundings with judgment that it is difficult to moderate that judgment when we become aware of and address our needs. Mindfulness provides that necessary moderation. One of its most wonderful qualities is its ability to cater to whatever you may be facing as an individual at any given time. If you feel broken, mindfulness is about healing; if you feel tired, mindfulness is about reenergizing; if you feel weighed down, mindfulness is about

regenerating. It is an art that is versatile beyond compare. The best part of it all? The benefits of mindfulness never expire!

A semester before I was introduced to mindfulness, I had started a new sport: aerial silks. A form of aerial acrobatics, aerial silks entails carrying out a series of movements on a piece of cloth suspended from the ceiling. Instantly, I fell in love with the sport. When I started taking mindfulness classes, however, I didn't expect that mindfulness would influence my aerial silks practice. Because it is such an unconventional sport, aerial silks requires a very different mindset from anything I had ever tried in the past. In fact, before you can even step foot on the silk, you need to have visualized the movement. When you then proceed to work on the silk, it takes an incredible amount of control. A moment of panic as you're up in the air and the ribbon could come loose, making you tumble to the floor in no time. Taking a mindful approach to aerial silks helped me immensely. I was able to slowly develop a unity between body and mind that allowed me to execute the movements I was visualizing far more quickly. Since this unity formed, I was also able to exercise greater control while on the silk, staying calm when my feet would come loose and when I felt like my muscles were ready to give in. I felt present while carrying out the different movements. I was better able to focus on how my body could match the image I had in my mind. I was improving at a much faster rate than I had been before, and this was just one of the many benefits I had begun to see since taking my first mindfulness class.

There will always be something to gain from mindfulness, whether it impacts our personal lives or our careers. Because mindfulness is about reconnecting with ourselves at the most basic level, it opens new perspectives for our brain, which result in increased creativity and innovation. One of the examples that stuck with me the most was that of Walt Disney: I remember reading a Huffington Post article that briefly discussed how Disney integrated meditation within the workplace, and how deeply it influenced creativity and problem solving. If mindfulness and meditation can help yield creative masterpieces like those of Disney, imagine what they could do for us every single day, both within and beyond the workplace!
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> Mindfulness is a powerful technique that ignites self-consciousness that stems from within, but has outward implications. The most creative and best ideas often stem from the most quiet and conscious awareness of our surroundings…
> – Yudi Tan, Village Alumnus, Class of 2016

When I first heard of the concept "mindfulness" as a senior, I thought it was just jargon invented by people who sit cross-legged with their eyes closed to make their practice seem more credible. I was a skeptic of meditation, and the buzzword "mindfulness" made me even more dubious. My ignorance of the practice led me to dismiss it: I'd always thought the only ways to get rid of stress and to "clear my head" were through exercise (biological approach) and proper planning (practical approach). I didn't believe that a simple five-minute breath practice could bring about the same effects, and I didn't fully understand what mindfulness truly meant.

Mindfulness is effective as a stress management and self-improvement tool; practicing mindfulness techniques helps us be more aware of our surroundings. I have grown to realize that mindfulness is not just about meditation and practices that heighten awareness. Rather, it is more about gaining strength and grit through conscious recognition of self. Being a teenager is tough: we must learn to juggle different roles and wear different hats. We are sons, daughters, students, athletes, friends, or presidents of clubs or sports teams. As we grow older, we take on more roles, or "wear more hats," which leads to more responsibilities and obligations. There's always the issue of trying to balance "who I am" versus "who I want to be." Our teenage life seems to be a big struggle: a struggle of self-identity and a struggle of fitting in.

What tools do we have to help us stay afloat and recognize our self-worth in a world that is drowning our voices? The technique that I was once so skeptical of turns out to be the most effective tool that I now have to cope with stress and maximize my potential in my various roles. My personal mindfulness practice has helped me develop my sense of self, by enabling me to notice my weaknesses and consciously identify and label them. Instead of letting every problem pile up into a jumbled mess (which was the reason for much of my stress in high school), I now use awareness of my strengths and weaknesses to develop grit to persevere through challenges.

I noticed that in the past, I tended to avoid thinking about problems, primarily because I wanted to avoid the stress. However, this approach backfired and resulted in more unnecessary stress because my problems were inevitable. In retrospect, I was better off solving these problems more proactively and earlier. Now, mindfulness techniques such as meditation and breathing exercises have helped me better cope with the overwhelming amount of tasks I have as a college student. Since starting college, my mindfulness practice helped me realize that the task or challenge is only as overwhelming as I make it. Yes, there are a lot of problem sets and coursework, but awareness of each assignment's importance, the ability to prioritize each assignment, and the skill of focusing on one assignment or part of an assignment at a time has helped me greatly reduce my stress. This approach also increases my efficiency, because while working on an assignment, I no longer worry about the other assignments at the back of my head, since I have already planned them out.

Mindfulness techniques also help us teenagers with our biggest stressors: tests or exams. As sons and daughters, we often take on the expectations of our parents, while experiencing peer pressure from our classmates. As a result, exams are our largest stressors. After taking Mindfulness at Village, I became curious as to how mindfulness could apply to learning and academics. I started reading about the concept of Deliberate Practice: a technique that integrates mindfulness concepts with learning. Being mindful, in this sense, means being consciously aware of the topics you are weak in and then deliberately practicing those topics over and over again until you fully grasp them. Mindful revision (Deliberate Practice) is a topic-oriented approach that boosts revision efficiencies, which helps reduce tests-related stress.

This approach of Deliberate Practice also applies to my entrepreneurial endeavors. This past year, I founded a startup that provides more connectivity in, and equality to, the education system in China by creating a platform that leverages online learning opportunities. In taking on the role of "entrepreneur," I began to realize the importance of mindfulness in relation to entrepreneurship and innovation. Mindfulness – being consciously aware – is central to all entrepreneurial endeavors, because the conscious effort of awareness of surroundings yields an understanding of needs and problems for which one can create a solution. According to Peter Thiel's lecture at Stanford, a startup is essentially an endeavor to solve a problem that no one has solved. This definition of a startup hints at the core concept of mindfulness: awareness. Recognizing a problem that needs to be solved is only the beginning of an entrepreneur's journey: balancing responsibilities, creating prototypes, and managing a team are some of the tasks that follow. Any entrepreneurial attempt is a balance of technical and people skills. Whereas large corporations are known for their office politics, smaller startups are highly dependent on the leadership and vision of the founder. One of the challenges I've faced while founding my startup was egoism. I felt that just because the startup was based on my idea, I was able to take on everything by myself. When we were accepted by a startup-accelerator program, I needed to be comfortable letting my co-founders handle the process while I focused on other aspects. At first I was hesitant, but, through my mindfulness and meditation practice, I realized I needed to reflect on my approach in the context of the larger goal. I realized I had to be comfortable not only letting go, but also knowing how to. As a founder, I've realized leadership isn't about hoarding resources: it is about complementing one's weakness with another's strength. Integrating mindfulness into my entrepreneurial endeavors led to more mindful leadership, which increased my ability to be comfortable with and trust with my team and myself, which led to better decisions.
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When I take time to fully embrace
reflective practices, I find myself

more self-aware and much less judgmental…
– Dr. P Tim Martindell, Village Faculty, Fifth Grade English Language Arts Teacher

My teaching and learning are at their best when most aspects of my personal and professional life are aligned. When I started graduate school, I had enough teaching and life experience to intellectually enjoy my studies. I had enough time in the classroom that with much of my new learning, I had many 'ah ha' moments: I could relate new concepts with specific students or time periods within my life. One particularly salient graduate school moment came in my curriculum history course. We read a wonderful essay by Ted Aoki, a Canadian curriculum scholar, who described his lived curriculum. I had to reflect on powerful life lessons and create/recreate my own life curriculum, much of which became key parts of my dissertation. In this reflection, I began to see that my best learning came when I had the chance to bring my creativity into the lesson.

In my teaching career, I have tried lots of innovative ideas, often on the spur of the moment, which engaged my students and kept me engaged, too. Although I was initially slow to adopt technology, I now seek to up my teaching game by utilizing Village's Google platform more. At first, I was reluctant to use the Chromebooks for anything more than word processors, until I saw the conferencing and coaching possibilities for engaging my students. As my students prepare for jobs of the future – jobs that do not exist today – what I can do best for my students is to open their eyes to being mindful in how they approach innovation. Our role as teachers is helping students see that there is not "one answer" – but that life is about seeing possibilities.

Our meditation group was a natural extension of the reflective practice I have been engaged in for the last twenty years. As a reflective Critical Friends practitioner, I learned to coach my peers and ask questions that probe and push thinking in myself and others. The meditation extended this reflection by providing a space for clearing my mind and rejuvenating me. Our meditation group fostered a similar peer space with an emphasis on quiet reflection. I would reference Aoki's curriculum of life again, in that our group meditation has been a powerful milestone in my unfolding life curriculum. Another researcher, Cheryl Craig, at Texas A&M, discusses the power of teacher knowledge communities in which new learning is organically lived and cultivated. I see our meditation group as such: a teacher knowledge community. We came together organically to foster a space for meditative practice. This aligns with my Critical Friends coaching practice, as there are several protocols (the Connections Protocol comes to mind) that promote reflection and quiet spaces for peer collaboration. These Critical Friends protocols were developed by teachers to foster equity of voice, collaboration,

and reflective school practice. The protocols offer concrete structures for having difficult, but safe, discussions that help teacher practice evolve.

When I experience the most impactful learning is when multiple layers of my life are aligned. The power of the meditation practice and quiet space has come at a period in my personal and professional life where I increasingly value self-reflection. When I take time to fully embrace reflective practices, I find myself more self-aware and much less judgmental. The use of the Critical Friends protocols (plus the knowledge of how to create a protocol to serve a particular need) has allowed me to take part in much deeper conversations about authentic issues in education. These structures taught me to be a better active listener and seek others' voices rather than to be the dominant voice in a discussion. Time and time again, I have seen the power of using these protocols with my peers to collaborate, work through dilemmas, and embrace our collective teacher knowledge. Another (Canadian) researcher, Margaret Olsen, explores the idea of knowledge creation and the notion of teacher narrative authority: teachers are experts in teaching by virtue of having the experience of teaching.
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> *Mindfulness offers us a way to shut out the noise of the world. We're able to focus on ourselves, our ideas, foster them, watch them grow mentally before acting on them…*
> – Lisa Finley McCauley, Village Faculty, Fifth Grade French Teacher

Our meditation group reminds me that I deserve peace and quiet during the maelstrom that is middle school. The last thing middle schoolers need is more emotional stress from their teacher! That short focus on myself, and done for myself, allows me to be a better teacher. Being able to think, work, and act for ourselves is key to personal growth. Meditation and mindfulness are little comfort bubbles where we only have ourselves to deal with (despite being in a room with others – meditation is a very private activity) and where we have to learn to master our issues, usually by letting them go – which is the MUCH harder route. Meditation makes us more self-reliant. We need to give our students more time to find this private, quiet space. Too many of today's kids (and adults) don't have enough time to themselves any more. Our children are constantly receiving commentary and feedback on their lives via social media, which makes providing this time to themselves even more crucial…
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> *Mindfulness is bringing myself to the present…*

> – Marcelle Marks, Village Faculty, Preschool Teacher

I have so much stress and anxiety in my life right now. With mindfulness and meditation, I bring this stress and anxiety to the surface and release it by taking deep breaths and picturing myself someplace serene. Until I was able to let go of my stress in this way, nothing would help. I can now let go of these feelings. The first few times I worked with Christine, I was scared to let go. The more we work together, the more I release the things that are beyond my control. This is particularly helpful since I teach three-year-olds. When I find their energy to be out of control, we sit on the floor and do deep breathing exercises. Sometimes we listen to soft music; sometimes we are quiet. This helps my students release their energy in better ways.
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> *I didn't think I could experience letting my mind go and my ideas flow...maybe this applies to what students can achieve: they might not even realize everything they are capable of until they take time to experience meditation...*
> – Elena Miniades, Village Faculty, Preschool Teacher

Mindfulness is being aware that you can see within yourself without distractions, for example feeling your pulse and your breathing. Mindfulness practices might include breathing, stretching, and letting go of outside intrusions. Meditation helps you calm down and have a better day at work as you become more aware of the physical states (tired, anxious, happy) that you are in. You realize that you can change these states with different mindfulness techniques. You realize that you can be relaxed and concentrate in that moment. Meditation helps me to be calm, to think, to do, to search, and to concentrate, and most importantly, to be able to achieve total relaxation. In this state, I can feel and realize my state of mind and what I am capable of achieving. Mindfulness makes me aware about how I can be interrupted by my inner thoughts or the outside environment, and gives me the tools to manage this. Mindfulness helps me know what my body and mind really need.

> Don't tell me the sky's the limit when there are footprints on the moon.
> – Paul Brandt, music artist, *There's A World Out There*

There is no spoon.
– *The Matrix*

Think different.
– Apple 1997 Advertising Campaign

Never doubt that a small group of thoughtful, committed, citizens can change the world. Indeed, it is the only thing that ever has.
– Margaret Mead

During the school year, I spend most of my weekends with our boarding students. One weekend, one of my students asked if we could chat. We discussed how our class had prompted him to prioritize his own self-care. We discussed how mindfulness, which helped him "be aware of the emotion in [his] heart, but not let it get to [his] head," had also helped him manage the college rejection process. With mindfulness, he recognized the rejection letters were signposts along his journey. He explained how in the moment, he felt upset and jealous of the ones who got in. But, the more he reflected, the more he realized these letters were not telling him he was "unworthy" but telling him to take a different path toward his goals. "I needed to recognize and acknowledge the hurt, frustration, and jealousy. After making space to sit with these feelings, I realized maybe I wasn't ready for whatever path would have happened had I gotten in."

My student's analysis precisely indicates the culture we seek to create at Village – a safe space in which students feel comfortable, encouraged, and inspired to practice independent self-reflection as they undergo their own transformation processes and create their own future. Mindfulness helped my student realize that though the people and events in his life – his "GPS" – had helped him navigate the college application process, his "GPS" didn't have the answer to whether and why he should go to a specific college (Zhao, 2012). Our conversation is one of the countless anchors I have that holds me to achieving our vision of wellness, creativity, and innovation at Village – not just rethinking education, but more importantly, redoing it. I knew no matter what signposts my student encountered along his journey, he would see each as a marker indicating an exponentially unlimited number of possible paths. Since my student saw his journey as a nonlinear network of opportunities, the sky was no longer his limit.

For the curious, who fearlessly keep their heads in the clouds while rolling up their sleeves up to get messy in the worlds they create in their backyards, the sky was never the limit. It never will be. Just like for Chauntecleer, everyone's favorite rooster in Chaucer's twist on Aesop's *The Rooster and The Fox* fable, who experiences the adventure of his lifetime in his yard, so too we experience the adventures of our lives as we get play and messy in the immensely transformational "yard" that is our lives. Our experiences in school must prepare us to manage our own adventures as we create them, teaching us not only to ensure our parachutes work, but also to realize when, how, and why to jump. Schools must be communities in which shared cultures, languages, and traditions create safe spaces in which students, teachers, and staff authentically, bravely, and compassionately combine the confidence and curiosity to "pursue ignorance" (Firestein, 2013). Schools must be a lab in which ideas are tested and dreams explored – so that as we fail forward, we innovate beyond what we thought was possible. Schools must be spaces in which relentlessly asking "Why?" and "But, what if…?" are valued.

By embracing the intersections of wellness, creativity, and innovation, education inspires this curiosity in children of all ages. Introducing mindfulness in school settings positions our students to act with compassionate curiosity, apply metacognition to understanding their learning and personal mastery processes, innovate sooner – and see, and sense, their world differently. Mindfulness not only provides us with a key to unlock our creative potential, but also helps us engage with, and make sense of, the messiness, pain, and transformational power of the creative mind.

Once we learn the rules, we see and sense when, how, and why to create our own. We test and question our assumptions about how the world works. Once we realize "there is no spoon," we free our minds to consider possibilities that breathe new life into old ways of tackling the complex challenges that pervade our present and face our future.

As we ensure our students are prepared to participate in, or create, the jobs of the future, we also must ensure our students have the self-knowledge to develop their fullest potential as they navigate their journeys – whether their "GPS" takes them to other continents, or to the stars. "Human intelligence might have control of the planetary environment, on a cellular and molecular level. This could lead to utopian creativity or dystopian insanity…the choice is ours" (Scharmer, 2016, p. 84). If our goal is utopian creativity, we must give ourselves consistent time in our day to explore this creativity: to reflect, meditate, and access uninterrupted, independent thinking time. For many, this time of exploration and wondering

may be the only time available to engage with our thoughts, feelings, and bodies in compassionately curious and non-judgmental ways. We must reflect on, and reconnect with, our authentic selves, as we develop them.

We are our best bet for a future that is not just different, but better – a future that truly takes us from 0 to 1. Creating this future is a gamble we simply cannot afford to lose. Creating a culture of wellness, creativity, and innovation that inspires individuals to develop their fullest potential and do well by doing good starts with us – the people. When I worked on Wall Street, my boss, Stephanie Whittier, a thought leader and innovator, always told me: "It's all about the people." She is absolutely right.

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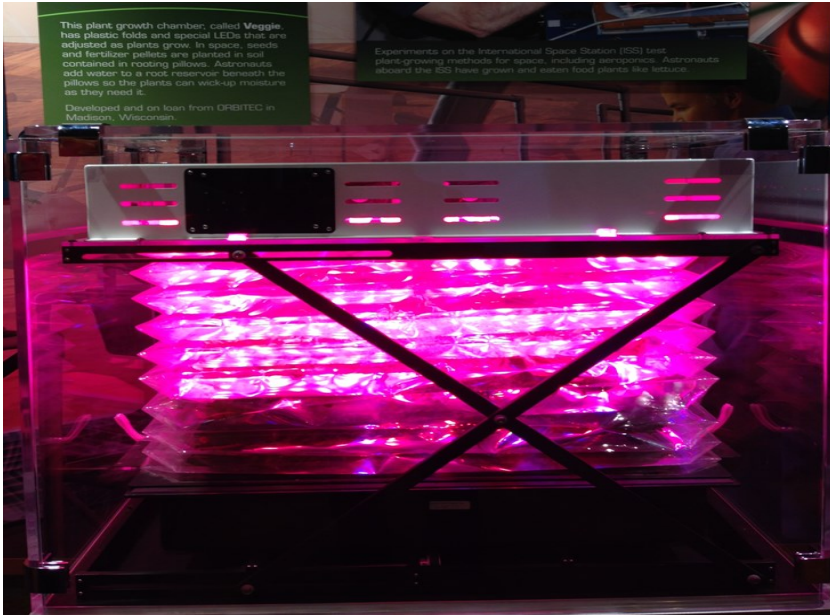
Appendices

Figure 1

Figure 1. "Veggie." The plant growth chamber on display at NASA Space Center Houston.
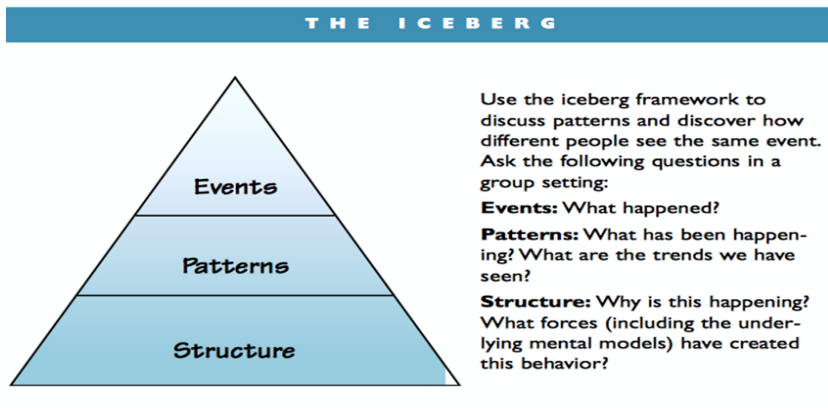
Figure 2

Figure 2. "The Iceberg" (Goodman, 1997, p. 7). Goodman's Iceberg Model is a tool for systems thinkers to uncover how individuals see the same event, and identify underlying patterns and structures that produce the event.

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Figure 3

Figure 3. "Mindfulness as a Foundation" (Galib, 2017). Mindfulness creates the space to observe the present moment in nonjudgmental, compassionately curious, and metacognitive ways. Mindfulness is foundational to wellness, compassionate curiosity, creativity, and innovation.
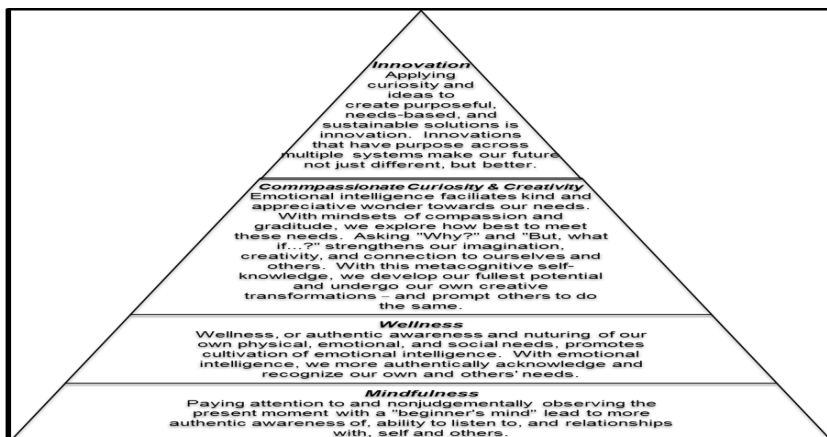
Figure 4

Figure 4. "Mindfulness as Light Bulb" (Galib, 2017). Mindfulness provides the non-judgmental awareness, compassionate curiosity, and gentle wonder to link the au-thored, established past to the imagined, emerging future. With mindfulness, we acknowledge, reflect on, and analyze the past; see and sense the present; and question, create, and innovate the future. We can't see our future from the perspective of our past, but by being present in each moment, we gain the awareness to create our future.

CHAPTER THIRTEEN

THE RELATIONSHIP BETWEEN CHILDREN'S CREATIVITY AND WELL-BEING AT SCHOOL

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Links between creativity and well-being have been examined in multiple studies (e.g. Cropley 1990, Maslow, 1954; Richards, 2010; Rogers, 1961). If, most of these researches were focused on adults, some of them also examine the cases of children and tend to show that creativity and well-being are positively related (Barnes, 2014). If the occurrence of this positive relationship seems to be systematic, there is no clear explanation nor description of the reasons and/or the nature of this inherent relationship. Thus, this chapter aims to explain how and why promoting creativity in children may be good for their well-being and vice versa. For that purpose, we will examine how specific trainings can enhance creative outcomes that may be related to well-being.

We will start by explaining what is known today as children's well-being through the different conceptualizations of child's well-being. Afterwards, more specifically, in order to clarify the possible link between creativity and well-being in children, this chapter will review embodied creativity trainings and creative school initiatives that might impact well-being and synthesize the initial studies in a comprehensive framework for future work.

1. Conceptualizations of child well-being

There is a vast literature on child well-being and it continues to expand rapidly (Amerijckx & Humblet, 2014; Ben-Arieh, Casas, Frønes, & Korbin, 2014; Casas, 2011; Pollard & Lee, 2003). A broad definition was recently proposed by Ben-Arieh and Frønes (2007, p. 1): "Child well-being encompasses quality of life in a broad sense. It refers to a child's economic conditions, peer relations, political rights, and opportunities for development. Most studies focus on certain aspects of children's well-being, often emphasizing social and cultural variations. Thus, any attempts to grasp well-being in its entirety must use indicators on a variety of aspects of well-being."

While the multidimensional nature of the concept is widely recognized by researchers and policymakers, the elaboration of consensual, unified, and inclusive comprehensive framework for child well-being remains largely

unresolved despite several attempts during the last decades (Ben-Arieh et al., 2014; Ben-Arieh & Frønes, 2011; Minkkinen, 2013; Raghavan & Alexandrova, 2015). Drawing a complete review of child well-being indicators and their multiple conceptualizations could be particularly ambitious in the present chapter (for a comprehensive review, see Ben-Arieh et al., 2014). In contrary, several critical components are briefly introduced in order to offer a better understanding of their relationships with creativity.

Objective or subjective indicators. A distinction is often made between objective and subjective indicators of child well-being. The first social indicators emerged in the 1960s were exclusively focused on objective external conditions such as material resources, safety, mental and physical mental, human rights, and so forth (Axfort, Jodreel, & Hobbs, 2014). However, it appeared that the objective indicators were not enough to capture the complexity of social realities. Subjective indicators were progressively developed and integrated in order to take into account the children's own perspective about the perceptions, evaluations, and aspirations regarding their lives (Casas, 2011). Currently, objective and subjective indicators are articulating together for providing a more holistic understanding of child well-being. Based on a systematic review of literature, Pollard and Lee (2003) found that subjective indicators of child well-being were more diverse and heterogeneous compared to objective indicators. Such heterogeneity may be explained by the fact that subjective indicators are also driven by various epistemologies (for a review, see Casas, 2011).

Subjective well-being or psychological well-being. Drawn from the science of positive psychology, subjective indicators are divided into two different conceptual terms: subjective well-being (SWB) and psychological well-being (PWB). SWB is based on a hedonic approach of happiness and can be defined as "a broad category of phenomena that includes people's emotional responses, domain satisfactions, and global judgments of life satisfaction" (Diener, Suh, Lucas, & Smith, 1999, p. 277). Accordingly, it includes both cognitive (i.e., life satisfaction) and affective components (i.e., positive and negative emotions). In contrary, PWB refers to a eudemonic approach of happiness and relates to psychological functioning and personal growth (Ryff, 1989). Although these definitions were primarily adult-centered, several authors highlighted their relevance for examining the children's perception of their own well-being (Amerijckx & Humblet, 2014; Ben-Arieh et al., 2014; Huebner, 2004).

2. Creativity and well-being in children: what are the relationships?

Some specific theories tend to explain how creativity and well-being in children are related. For instance, Carson, Bittner, Cameron, Brown and Meyer (1994) explained the relationship of children's stress responses and coping

abilities, two well-being indicators, with creative thinking. In their study, they found a strong correlations between coping abilities and flexibility, fluency and originality. They discussed that the ability to have flexible thinking and have a fluent and original generation of ideas contribute in a significant way to successful coping abilities. The capacity to think creatively might influence the finding of novel solutions to problems and situations; thus, favouring coping stress abilities and so influencing positive emotions and well-being.

Considering empirical researches, there are different kind of studies showing that creativity and some indicators of well-being are positively related.

The first kind showed that positive emotional states favor creative performances. In that way, Morrongiello, Stewart, Pope, Pogrebtsova and Boulay (2015), conducted a study in which they inducted 68 children with a positive and a neutral mood, revealing that children showed greater risk-taking attempts when they were in a positive mood state compared with a neutral one. They concluded that a positive mood state could be associated with greater risk-taking in elementary-school children. In this way, positive mood state was related with risk taking, which is a cognitive mediator of creativity.

In other investigations, researchers showed that self-report well-being is positively correlated to creativity. For example, in 1990, Cropley studied the relationship between mental health and creativity, taking in account several authors that proposed creativity elements as part of feeling well. He established a relationship between psychological aspects of personality and creativity, establishing that most of the characteristics of a creative person, such as flexibility, openness, humor or playfulness among others, are similar properties of those of a healthy personality. For him, the enhancement of mental health, a concept related to well-being, should be achieved through the encouragement of people to perceive and live their quotidian lives in a creative manner. Some decades before, in 1971, and republished in 1976, Maslow proposed a more holistic point of view, establishing that there wasn't just a single thing that helped develop creativeness. For him, there were several determinants for creativity, and these determinants were intimately related with the enhancing of the psychological health of the human being. He said that the way to the growth of psychological health will change the person in all ways, driving him or her to be a fuller person. "This more fully human, healthier person would then, epiphenomenally, generate and spark off dozens, hundreds, and millions of differences in behaving, experiencing, perceiving, communicating, teaching, working, etc., which would *all* be more "creative"." (p.74). Carl Rogers, also a humanistic psychologist, shared Maslow's perception of a human natural tendency to self-actualization considering that well-being was directly related to the fulfillment of one's growth potential. For him, creativity was one of the five basic characteristics to achieve what he understood as well-being, establishing that risk taking, as a part of creative thinking was a fundamental part in the life of a "fully func-

tioning person" (Rogers, 1961). These examples, that are only a few among several others, show how in both perspectives -from positive emotional states to creativity and from creativity to positive emotional states- authors have been interested and studied this relationship in adults. Nevertheless, this relationship in children's population remains less studied, and so, less clear.

In a study measuring the impact of some well-being initiatives in schools (Galton & Page, 2015) it was shown that schools that were engaged in a Creative Partnership developed some children's personal competences that might be linked to well-being. The Creative Partnership is an english initiative to promote creativity all along the scholar curriculum. Different artists engaged with schools in order to develop projects together. Galton and Page (2015) highlight the report of Ofted (2010 in Galton & Page, 2015) in which he suggests that this Creative Partnership (CP) could transform children's life because of the impact on their self-confidence and self-esteem. For Galton and Page (2015) this enhancement would play a direct role in the enhancement of well-being through an hedonic and eudaimonic point of view (see Peterson & Seligman, 2004). From another well-being perspective, Galton and Page (2015) analyzed the way of doing pedagogy of the schools engaged in CP, and found that primary schools preferred exploratory children-centered pedagogies, establishing learning objectives according to children's experiences. According to Galton and Page (2015) the motivation theory supports this kind of pedagogy as "these shifts away from default pedagogy should promote a greater sense of well-being" (p.2, Deci and Ryan, 2008 in Galton and Page, 2015). Some of the outcomes found by the study of Galton and Page were related to children's feeling of autonomy, and of being capable or good at doing something in addition to a sense of belonging to their schools. These outcomes made them think in a direct relationship with Ryan and Deci's (2000) Self-Determination Theory (SDT) that proposes that the achievement of well-being is given through the fulfillment of three basic needs: Competence, Autonomy and Relatedness. Hence, the implications of Creative Partnerships in schools promoted well-being through the enhancement of heudonic and eudaimonic (Seligman, 2000) happiness and through the fullfillment of the basic needs of competence, autonomy and fulfillness (Ryan & Deci, 2000).

Most recently, as part of an ongoing investigation, Celume, Besançon and Zenasni (ICEI, 2017) showed how positive emotions were inducted on 385 children, seeking to find a relationship with creative thinking and emotional intelligence. These results weren't entirely satisfactory so as a second approach they decided to come from the other way round, studying the possibility of conducting a creativity training based in novel pedagogies that would have an influence on children's well-being. The first pilot was tested on 209 school children from 8 to 10 years old, from three different schools. Results showed an increase of positive emotions of the 150 children aged 9-10 that participated in the experimental training over those children participating in the control training. Details will be explained below.

3. Embodied creativity trainings and their impact on children's well-being:

According to Byrge and Tang (2015) there are two approaches of creativity trainings: embodied creativity training and reflective creativity training. The first one is focused on the development of the participant's creative abilities, while the other, focuses more on the development of creativity metacognition (theories, techniques, processes). For our analyses we will consider the first group of creativity trainings, more related to active exercises like game based trainings, arts based trainings and creative drama trainings.

As seen above, creativity has been proved to be related to creativity (Carson et al., 1994; Galton and Page, 2015; Morrongiello et al. 2015) but how a creativity training may affect children's well-being is still an object of study.

Most of creative training workshops for children use play as a center of their programs. This decision, is probably made, because play is an activity that children chose in a free and happy way (Huizinga, 1950). When working with children, we can observe how they are immersed in the game when playing, and so they are able to find several solutions while being entirely committed to the act of playing. Csikszentmihalyi (2009) explains this as the flow experience, when the action is made just for the sake of doing it, permitting him/her self to be creative and to feel intrinsically motivated. Thus, play will be increasing children's well-being. Piaget (1962) points out a relationship between play and creativity, noting that there is something innate in playfulness that permits creative imagination to develop. Moreover, in a study made in 2012, by Hoffman and Russ, showed how pretend play contributed to creative learning, and several other studies show how play is related to creativity in several manners (e.g. Berretta and Privette, 1990; Christie and Johnsen, 1983; Kogan, 1983; Krasnor and Pepler, 1980 ; Sutton-Smith, 1979). In order to clearly see the relationship between creativity and well-being in children, we are going to present some studies made in different countries that analyzed and tested different creative approaches and how their outcomes are related to well-being.

In a study made with primary school children in Korea by Shin & Jang (2015), they found that the most effective way to build children's team work and social well-being, is to use play in group creativity trainings. They suggest that these activities in creative trainings permit children to enjoy altogether, and mentions that it allows them to laugh, feel better, and have fun at the same time (p.7). They also show motivational outcomes of group creativity trainings, showing that although the differences in children's personality, after a creativity training, students felt more motivated. This, related to group commitment and a subjective sensation of effectiveness. As we saw, the need of feeling valuable for doing something is an important factor for increasing intrinsic motivation (Ryan & Deci, 2000), and according to Shin & Jang (2015) these can be achieved through creativity trainings. Group creativity trainings provide a safe environment in which children can freely play, devel-

oping positive emotions, group cohesion and group creativity. In this line, play enhance positive emotions which suggest that creativity training based on play may enhance children's well-being through the development of positive emotions.

Ebert and Hoffmann (2015) made a study that started the validation of an emotion and creativity skills development training through the observation of arts and art making activities. The workshop was tested on spanish children aged 6 to 12 years old. They suggested that according to some authors, like Winner, Goldstein and Vincent-Lancrin (2014) arts in general, may enhance quotidien creativity through the encouragement of creative thinking abilities. They trained two facilitators that conducted the six-session training, targeting a specific emotion in each of the 5 first sessions. The results of this training corresponded to their hypothesis, developing emotional and creative skills, but what's interesting for our analyses is that children reported to feel more motivated for this kind of creative workshop, or that they would seek for other workshops of this kind. Also, there was a child that expressed that he learned how to voice his own opinion, thus can be related to the cognitive mediator aspect of creativity known as risk-taking. Risk taking can be related to Ryan and Deci's SDT (2000), in which autonomy, another fundamental for intrinsic motivation is described as the perception that there are choices to be made, and that the person can "self-determine" what to think or to do. The ability of taking risks and sharing one's ideas or opinions, develops this perception of self-determination which would positively affect children's intrinsic motivation and this well-being. Children in the workshop also commented to be more motivated after the training, highlighting their interest in art appreciation and art making domains. In any case, the researchers point out that there was an initial interest in art based activities, so they expressed that taking in account the relationship established by other authors between intrinsic motivation and creativity (Amabile, 1996), this initial motivation might have helped the enhancement of creativity.

Also in 2015, in China, Hui, Chow, Chan, Chui and Sam made a two-study-research of Hong Kong classrooms and creativity. The topic of well-being is directly addressed in the study, as the authors state that academic success in an Asian school doesn't allow a place for happiness; rather learning is a "serious work" (p. 3) They also consider the results of some studies that suggest a link between creativity and the development of personal and intellectual skills in children (e.g. Sylva, 1984; Veraska, 2011). Personal skills development is one key need in Maslow's (1943) hierarchy model of of well-being. For him, in fact, the final step in the pyramid of needs is self-actualization, which can be seen as personal development, growth and fulfillment. So, in order to see the outcomes of creative education in children, they conducted a first study, implementing a creative-arts training in line with the curriculum for chinese kindergartens. This creative training lasted 8 weeks, and integrated linguistic, dance, music and visual arts in order to stimulate curiosity. This first study had positive outcomes in creativity, enhancing also

personal skills. These skills developments suggest an increase in children's well-being considering Maslow's (1943) pyramide and the fact that creative thinking has already been related to positive emotions, which is one key component of Seligman's PERMA model (2011).

Creative drama trainings and children's well-being

In the example above, we have seen how Hui et al (2015) were able to prove that an arts-based training could improve children's well-being in Hong Kong students. In their second study from the same research, they used a drama-based creative training. The drama-based creative training showed an increase of creativity and other personal skills. It was also noted that children in the second study were favoured to practice reflective thinking, understanding of abstract concepts, play, exploration and imagination. As we have previously seen, play is directly related to well-being through the enhancement of positive emotions and the experience of flow in children. In the same line, the encouragement of imagination development could also be linked to children's well-being. Children's development of imagination might help them to consider new solutions and ideas through imagining new possibilities helping the development of flexible thinking and perspective taking. Thus, taking Ryan & Deci's (2000) model of well-being, perspective taking would help fulfilling their need of competence by showing the child other options and solutions and by other hand, from Seligman's (2011) 'PERMA' model, in where positive relationships are basic elements of well-being, enhancing imagination and thus perspective taking, would also develop positive relationships by letting the child imagine being another and seeing other possibilities by taking another's perspective. This, would help the child to understand other's ideas and opinions, helping him/her develop empathy, and thus positive relationships towards others.

In another study, leaded at Taiwan by Yeh and Li in 2008, they also conducted a creativity training based in creative drama. They tested this creativity training in order to see its impact on creativity, as well as the effect of age, emotion regulation and temperament on creativity. The study well confirmed that creative drama training was positively related to creativity enhancement. Creativity was also related to emotion regulation strategies, showing that emotional regulation has a positive influence over children's creativity. Emotional regulation is the capacity of using strategies for observing, appraising and modifying emotional responses (Mayer & Salovey, 1997; Gullone & Taffe, 2012) to emotional experiences. Identified by Mayer and Salovey (1997) as a core element of Emotional Intelligence, emotional regulation has been related to the capacity of responding to unpleasant events in a healthy way or the capacity of successfully coping with stress. Individuals with higher emotional regulation will search for response strategies that would enhance positive emotions instead of strategies that will lead negative emotions, like frustration. In sum, Yeh and Li (2008) found that emotion reg-

ulation strategies had a positive influence over children's creativity. The fact that a higher emotional regulation had a positive effect on children's creativity, lead us to suggest that positive emotions, are enhanced through emotion regulation strategies, influencing creative thinking. Zenasni and Lubart (2002) already showed how positive emotions could increase creativity. Moreover, as Yeh and Li (2008) highlights, Lubart and Getz (1997) proposed that positive emotions might promote creative thinking because of their relationship with finding problems and insightful solutions. So as Seligman (2011) proposes, positive emotions are a core element of well-being, in this line children's well-being will be directly related to creativity, being well-being a booster of children's creative thinking.

Barnes (2014) between 2011 and 2012 gathered an important number of outcomes related to the basis of a drama based training and well-being development. In his work, he presents the outcomes of the Speech Bubbles project, a drama based program that aimed to develop several skills in children with communication difficulties. It is important to remark, that this program was not only a drama-based program, but was mostly based in creative drama characteristics that are related with directed play and games focusing on the process of learning over an artistic end. This programme was conducted in England for six and seven-year-old children and devised by theatre practitioners. The program had already a theoretical framework based in positive emotions and play. Frederickson's theory on positive emotions (2004) was a key model for the development of the program, as well as Paley's (2004) approach to education through play. Frederickson (2009) suggests that the development of positive emotions permit us build up mental, social and physical resources, fundamental for developing the capacity to effectively overcome tragic events or difficulties in life. By her side, Paley (2004) claims that a powerful tool for securing children's psychological and social development is through fantasy play. The results of this creative drama training were quite positive, enhancing communication skills, collaborative behaviour and several positive emotions observed during the nine months of duration of the program. Positive emotions expressed by the researchers were, for example joy and love that were observed in children's body language, expression and interactions with the practitioners. Other positive emotions that were outlined were interest and engagement. As we have seen, interest is the basic component of intrinsic motivation. Intrinsic motivation in the SDT theory (Ryan and Deci, 2000) is the kind of motivation that comes from the inside of the person when the activity or situation the person is in, is being performed just for the sake of doing it. This, fulfills basic needs that lead to well-being. In a similar way of Csikszentmihalyi's (2009) theory of flow suggests that when the person is fully engaged to a situation, the flow sensation appears and this sensation conducts to experiencing well-being. Both positive emotions, interest and engagement have been proved to be related to the well-being experience. The other positive emotions that were named, can also be related to a well-being's theory. According to Seligman's (2011) PERMA model and the happiness

theory, positive emotions are the basis for developing well-being. Also, the subjective perception of positive emotions is a key indicator of subjective well-being. Barnes (2014) claims that these positive emotions, that have been observed in children through body expression, were well-being indicators that were improved and sustained in 75% of the participants. Moreover he proposes that respect and the active listening presence of practitioners may give "the sense of environmental and self-control identified by Ryff (1989) as essential components of well-being."(p.108). In sum, although this example is more related to a drama games training and its relationship with well-being, it is important to note that creative drama training is based in a drama pedagogy games that have shown to enhance creative thinking as a primary outcome (e.g. Karakelle, 2009; Hui et al., 2015).

The last example that we will analyze is currently being held with primary school children in France. An ongoing research, presented at the International Conference of Emotional Intelligence, in Porto, 2017, still on data analyses phase, has been made (Celume et al., ICEI, 2017) carrying out two studies and it was held in order to develop creativity and emotional intelligence in primary school children. The first part of this ongoing research was conducted at the end of 2016, and failed to prove that positive emotions had a positive influence over creative thinking using creative drawing tasks. It was concluded that these unexpected results could be explained by a lack of understanding of the given instructions by children that forced to take off almost the half of the participants' drawings. However, these results led us to look at this relationship between creativity and positive emotions from another perspective. This perspective focused on the effects of creativity on children's well-being and positive emotions, finding several studies that proposed games as a motor for creativity and positive emotional outcomes (e.g. Berretta and Privette, 1990; Moore & Russ, 2008). What motivated the attention, was that several of these studies, proposed dramatic games as part of their trainings, so it was decided to focus on these kinds of games in order to create a training. As part of the research, we found the validated program of Maite Garaigordobil's "Programa Juego" (2003, 2016) that specialized in the creation of creativity and collaborative games programs for school aged children in Spain. We also looked at other non-scientific publications made by different authors (Garcia-Huidobro, 2004; Kende, 2014; Boal,1989; Hammond, 2015) creating a pilot training made by the adaptation of Garaigordobil program (2003, 2016) because of her focus on 8 to 10 year-old children. In addition, we used some activities found in Garcia-Huidobro's (2004) and Boal's (1989) books. For this second study, 209 children between 8 to 10 years old participated, resulting in positive outcomes for 150 children aged 9 to 10 years old, in both creative thinking and positive emotions. Children who attended the drama games pedagogy training scored higher in the divergent thinking drawing task over those children attending the sportive games training. This study also showed an increase of positive emotions after each session, being also higher in contrast to their sportive games attending classmates (t=3,7 p<.00). One of

the conclusions of this study, that were presented at the conference, was that the fact of being involved in creative dramatic games and activities, made the children feel better than those children involved in a more competitive training. This could be explained by the engagement and sense of collective achievement given in the creative dramatic games and activities in which there were no winners and losers, but only a sharing of the collective process and the achieved result, which was a process itself. For Seligman (2011) four important aspects of his well-being model the "PERMA", are positive emotions and relationships, engagement and achievement. When children were participating in some of the drama pedagogy games, they were building new positive relationships with people they have not met before, even if they were in the same classroom. As some of the children said, they were happy because they have realized that they could be able to play with some people they thought they did not like, with whom they have not even talked before, and now they are closer. Children build new positive relationships with others bringing them positive emotions. This, could be also taken as an achievement itself. Nevertheless, what Seligman (2011) explains as Achievement (or Accomplishement in his words) is the achievement of doing something for its own sake, just because. During the drama pedagogy games, it was also observed how children were immersed in the activity they were doing, they were interested and concentrated in the game. In most of the activities, they played to be someone or something else, just playing because of the sake of doing it, at the point of having some of the children continuing their characters after the training session was finished. Similar as to what Csikszentmihalyi (2009) says, this immersion in the game, brings an estate of full enjoyment, of flow. Csikszentmihalyi (2009) Flow theory, says that being interested, concentrated and enjoying an activity at the same time permits flow to occur. He stated that flow is achieved through creative and artistic activities, when they represent a challenge that is achievable for the people pursuing the challenge, but that still challenges them (Admiraal & Huizenga, 2011). Hence, this pilot program achieved getting the children in a flow state through fully engagement in creative drama games that challenged them to solve different problems and situations. This iswhat might have helped enhance divergent thinking. This work, also let them develop positive emotions for both the games and their classmates and helped them find new solutions in a collaborative way. Solutions were encouraged to be developed by listening to others' opinions and ideas and by presenting their own perspectives, so they could practice seeing ways from a different approach and enhancing their ability of finding and defending their own ideas or solutions. As some of the children said, they did learn to be able to speak out their own ideas or solutions in front of the group. Hence, the drama pedagogy games training pilot, established a link between some creative aspects such as perspective taking, solution finding and risk taking, through the engagement in playful and creative games, teaching them to experiment with flow and feel positive

emotions, which was measured through a self-response scale, taken as an expression of the increase of their subjective well-being.

Concluding thoughts

In the table shown below we describe the trainings analyzed, their outcomes and how they are related to different well-being theories.

Creative Training or Creative Initiative	Country	Outcomes related with well-being	Reference
Creative Partnership workshops	England	• Self- confidence • Self-esteem • Autonomy • Sense of capability • Sense of belonging	Galton, M., & Page, C. (2015).
Group Play workshops	Korea	• Motivation • Sense of group commitment • Sense of effectiveness • Positive emotions	Shin, N., and Jang, Y-J. (2015).
Arts appreciation and art making workshop	Spain	• Risk taking • motivation	Ebert, M., Hoffmann, J.D., Ivcevic, Z., Phan, C., Brackett, M. (2015).
Linguistic, dance, music, visual arts (creative-arts workshop)	China	• Positive emotions	Hui, A.N.N., Chow, B. W.Y., Chan, A.Y.T., Chui, B.H.T, Sam, C.T. (2015).

Creative drama workshop	China	• Playfulness • Positive emotions • Imagination • Perspective tak-ing • Positive relation-ships	Hui, A.N.N., Chow, B. W.Y., Chan, A.Y.T., Chui, B.H.T, Sam, C.T. (2015).
Creative drama workshop	Tai-wan	• Emotion regula-tion strategies • Positive emotions	Yeh, Y-C., Li, M-L. (2008)
Speech Bubbles, Creative Drama workshop	Eng-land	• Positive emo-tions: joy, love • Engagement • Interest	Barnes, J. (2014)
Drama pedagogy workshop (Creative drama based)	France	• Positive emotions • Engagement • Sense of collec-tive achievement • Positive relation-ships • Motivation	Celume, M-P., Besançon, M., Zenasni, F. (2017).

These analyses have shown how creative trainings and initiatives can be related to the enhancement and development of children's well-being. Most of the presented trainings were created through a play perspective, considering that children feel free and happier to engage in play. Another observation that arises, is that most successful creative trainings that relate to well-being, are based in active-engaging artistic activities, like visual arts or drama. A final observation that can be made is that most of the analysed trainings claim positive emotions as a core outcome of their programs.

Children's creativity has been proved to be enhanced through training, although children's well-being is still a subject of discussion. Nevertheless, the enhancement of motivation, self-confidence and positive emotions in the classroom seem to be like a good starting point to continue in the research of fostering children's and adolescent's well-being in school contexts.

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CHAPTER FOURTEEN

WATCHING THE TIDES CHANGE BACK TO GOOD NEWS: REFLECTIONS ON CREATIVITY AND WELL BEING

JAMES C. KAUFMAN

ABSTRACT In this chapter, I discuss how creativity's relationship with well-being (and mental illness has changed over the years). I then synthesize the themes of the chapters and discuss some underlying issues for the future.

Watching the Tides Change back to Good News: Reflections on Creativity and Well Being

For years, creativity was seen as a wonderful and personally meaningful thing (Frankl, 1946). It was at the heart of the humanism movement; to be a well-rounded, satisfied person meant being creative (Rogers, 1961). Creativity was celebrated. Although creativity would continue to generally be considered a benevolent construct (and is included within the larger topic of positive psychology; Seligman & Csikszentmihalyi, 2000), the tides began to shift.

In the decades to follow, the idea began to spread that creativity was linked to mental illness. The most frequently-cited work (e.g., Andreasen, 1987; Jamison, 1993) was so flawed and poorly conducted (see Schlesinger, 2012) that the larger conclusions being drawn about creativity and mental illness were damaging castles built in sand. I understand the inherent appeal, perhaps as much as anyone. Some of my early work explored nuances of the link between creative genius and mental illness, most notably the Sylvia Plath Effect (Kaufman, 2001; see also Kaufman, 2003, 2005; Kaufman & Baer, 2002). I have tried a few recent *mea culpas* (Kaufman, 2014, 2016, 2017), but what I find much more encouraging than playing apologist for past studies on creativity and mental illness is to play cheerleader for new studies and papers on creativity's link with positive well-being, as are outlined in this book.

Creativity's potential to help people is coming back into vogue again and I could not be happier. The papers in this volume help illustrate the many different approaches that are being taken to demonstrating the power of creativity. Many explicitly examine creativity and positive well-being. For example, Kapoor and Tagat examine the connection at the country level. Celume, Sovet, Lubart, and Zenasni review many promising ways in which creativity training and creativity initiatives are linked to specific outcomes associated with positive well-being. Hughes and Wilson explore how creative and posi-

tive well-being can work hand-in-hand in a strong learning environment and offer suggestions for how universities can better support this process. Boutry highlights how a creativity program in an urban community college has led to increased student well-being. Quarrie argues that creativity and well-being can work together in a symbiotic relationship such that each helps increase the other.

Some papers study different potential moderating variables. Galib discusses how mindfulness can help connect creativity and positive well-being. Hammrich, Cellitti, and Donaldson describe a learning activity called cooperative controversy that enhances both creativity and feelings of student empowerment. Other papers point to additional benefits of creativity. Reisman, Maliko-Abraham, Keiser, Severino, and Connell take a strengths-based approach to show how students with autism, dyslexia, and dyscalculia can both demonstrate their creativity and how their creativity can be nurtured. Coste and Nemeroff explore magical, cultural, and religious beliefs and emphasize that creativity and madness are notably different both in their roots and expression.

In addition, several essays discuss how we can work to improve creativity in education and beyond. Wilson, Lennox, Brown, and Hughes argue that as technology continues to advance, creativity and creativity-related skills are more and more vital in finding a job. If schools want their students to be employable, then an increased focus on creativity in education is essential. Moker discusses the results of a new shared general education requirement to take classes that emphasize creativity and innovation. Brown, Paterson, and Wilson analyze the creative process in modern musical creation. They offer a new model of Inspiration, Exploration, and Experimentation, as well as discuss several different potential tools that can help this process. Finally, Tsai studied artistic creativity and, surprisingly, found that conscientiousness was the strongest predictor of creative performance. This study does reinforce the idea that being organized and taking care with one's work – not the stereotype at all of the "mad genius" in the arts – is a crucial skill.

Looking at this collection of important essays, I am struck at how creativity as a field is beginning to re-embrace its positive attributes. The underlying themes of this volume – how creativity and positive well-being are related, which other variables may interact with this relationship, and how creativity (and, therefore, positive well-being) can be enhanced in educational institutions – are ones that are ripe for further studies, analysis, and discussion. I am excited to see how these authors and others will build off of the ideas presented herein and continue to develop these important positions.

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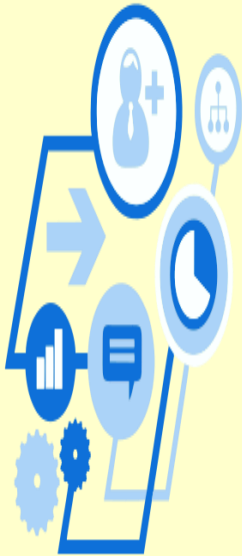
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