Assessing Resilient Agency with CLARA: Empirical Findings from Piloting a Visual Analytics Tool at UTS

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Abstract

University graduates are entering an increasingly complex and fragmented job market and graduates are expected to bring both subject discipline knowledge and the ability to manage complex and changing environments. To help students reflect on and develop their resilient agency in learning, the Crick Learning for Resilient Agency (CLARA) survey tool was trialled across a number of discipline areas at the University of Technology Sydney. There were significant positive changes in students' learning power after the interventions, and patterns of learning dispositions amongst different types of students suggest there are different 'archetypes' in the population. We describe the qualitative and quantitative data that this emerging initiative is generating, illustrative analyses, and preliminary findings covering both the strengths and weaknesses of deployments in different disciplinary contexts.

Rationale

The overwhelming conclusions from analyses of the future of work indicate that graduates must be equipped for continual learning in order to thrive in the turbulence of 21st century society. These go beyond the qualities associated with individual high academic performance in conventional assessments, or mastery of subject matter knowledge. Deloitte's (Bersin, 2017) research report on the Future of Human Capital identified the critical importance for industry to build organisations in which 'agility plays a central role….as companies race to replace structural hierarchies with networks of teams, empowered to take action' (2017, p. 5). Such agility is driving companies towards 'always on' learning that enables individual members of the workplace to grow and thrive, through continuous feedback and coaching, with digital platforms serving and enhancing workforce adaptation, engagement and 'on the job' transformation. These links between learning, capability and corporate performance are well understood in the invitation to see corporate organisations as learning systems (Senge, 1995) and in the identification of 'learning agility' as a critical indicator of future potential (Eichinger, 2004). The World Economic Forum's (2016) report on 'The Future of Jobs' identifies complex problem solving as the overall most significant employability skill with 'cognitive flexibility' as emerging as a new priority: that is the ability to 'change your mind' – having a flexible and critical mindset that can adapt and change.

As part of its response, the University of Technology Sydney (UTS) has prioritised models of learning that build creative, transferable competencies across disciplines. Part of this strategy, the focus of this report, has involved piloting the Crick Learning for Resilient Agency (CLARA) survey to measure and feedback to students a visualisation of how they perceive their appetite for complexity and challenge – or in other words their ability to engage profitably with learning opportunities. The overall goal of the CLARA is to help students

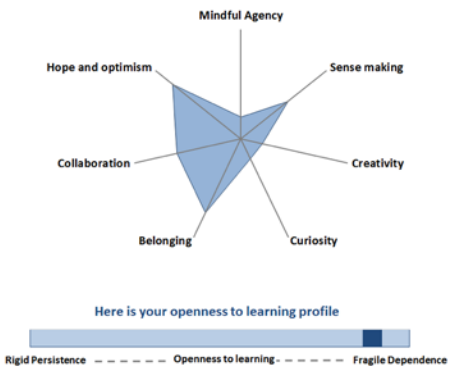
identify their strengths and weaknesses, and to turn that information into strategies for change in order to build resilient agency and become self-directed learners (Deakin Crick, Huang, Ahmed-Shafi & Goldspink, 2015). The survey comprises 49 questions loading to eight dimensions of resilient agency: Mindful Agency, Hope & Optimism, Sense-Making, Creativity, Curiosity, Collaboration, Sense of Belonging and Orientation to Learning. Qualities such as these are often referred to as learning dispositions (Buckingham Shum & Deakin Crick, 2012). Figure 1 below presents a brief definition of each dimension.

Mindful Agency Is taking responsibility for your own learning. It's about how you manage your feelings, your time, your energy, your actions and the things you need to achieve your goals. It's knowing your purpose - then knowing how to go about achieving it; stepping out on the path towards your goals.	**Curiosity** is your desire to get beneath the surface, find things out and ask questions, especially 'Why?' If you are a curious learner, you won't simply accept what you are told without wanting to know for yourself whether and why it's true.
Hope and Optimism is being confident that you can change and learn and get better over time. It is helped by having a positive learning story to reflect upon, that gives you a feeling of having 'come a long way' and of being able to 'go places' with your learning.	**Collaboration** is how you learn through your relationships with others. It is about knowing who to turn to for advice and how to offer it too. It's about solving problems by talking them through, generating new ideas through listening carefully, making suggestions and responding positively to feedback.
Sense Making is making connections between ideas, memories, facts - everything you know - linking them and seeing patterns and meaning. It's about how 'learning matters' to you, connecting with your own story and things that really matter.	**Belonging** reflects how much you feel you belong as part of a 'learning community' – at work or at home, or in your wider social network. It's about the confidence you gain from knowing there are people you learn well together with and to whom you can turn when you need guidance, support and encouragement.
Creativity is using your imagination and intuition, being playful and 'dreaming' new ideas, having hunches, letting answers come to you, rather than just 'racking your brains' or looking things up. It's about going 'off the beaten track' and exploring ideas.	**Openness to Learning** is being open to new ideas and to challenge and having the 'inner strength' to move towards learning and change, rather than *either* giving up and withdrawing *or* 'toughing it out' and getting mad with the world. Becoming more open to learning is like a pathway to all the other dimensions of learning power, just as the other dimensions also help you become more open to learning

Figure 1 Dimensions of Learning Power

CLARA is designed not to grade students, but to provoke them into recognising and taking responsibility for their learning (Deakin Crick & Goldspink, 2014). CLARA gives students feedback via a spider diagram ((e.g. http://clara.learningemergence.com),, and resources for reflection to help them develop strategies to build their resilient agency, both at university and the workforce. CLARA is designed to be embedded in the curriculum or as an extra-curricular activity. In some pilots, CLARA profiles are introduced to students with associated fictional student narratives as part of student led focus groups, as a way to help them understand how strengths and weaknesses might explain a profile (Figure 2).

This project sought to better understand the key factors that promote or impede the effective deployment of CLARA as a tool for developing resilient agency in students in UTS subjects.



Jade moved to Australia from abroad last year. Her parents want her to go to University and be a nursing student so that she can get a respected job and earn a good wage. She is an only child but she is very sociable and has many friends. Her parents have worked really hard to get her here so she feels under pressure make sure she does well at Uni.

She's a very hard worker – she always got good grades at High School. She diligently listens to what the teacher says and does exactly what she thinks is expected of her but her grades haven't been as good as she hoped. When she is faced with an open-ended question or a problem that doesn't have a single right answer she panics and doesn't know how to proceed. If there are rules to follow she is comfortable in her learning but when faced with complexity and uncertainty she gets confused and feels 'groundless'.

Figure 2 Example of a CLARA profile associated with a fictional student 'persona', used to help students (in Science and Nursing) reflect on their own CLARA profiles.

Piloting at UTS

CLARA was piloted at UTS between 2015 and 2016 as part of the university's Learning.Futures programme, which seeks to combine the best of face to face and online learning in a practice-oriented, research inspired environment, to prepare graduates for a global workforce. Six pilot projects were undertaken across four faculties.

Purpose of the Study

The purpose of this study was to evaluate the impact of the prototype CLARA interventions on students' experience in learning and on tutors' teaching and learning design. The outcome of the evaluation will be used for improvement purposes, leadership decision-making and the development and scaling of new projects.

Research Questions

The research aim was to explore the impact on students and tutors of the integration of the self-assessment of student learning power, and associated interventions on students' learning and achievement, and on tutors' practices in four faculties. The following supplementary questions were identified:

a. What are students' experiences of self-assessment of learning power in terms of their development as self-directed learners?
b. What is the impact of these interventions on students' learning dispositions?
c. What are tutors' experiences of the use of CLARA as a self-assessment tool within the curriculum

Research Design

The research project was a non-experimental, mixed methods, naturally occurring evaluation of teaching and learning interventions. It provides evidence which can be used for ongoing improvement of pedagogies across UTS which are designed to support self-directed, authentic learning and for supporting best practice in the preparation of students for graduate employability. Quantitative data from all student participants was collected and collated into a unique data set for evaluation. Qualitative data were collected by researchers between

November 16 and January 2017 from students and tutors. A total of 2983 students undertook the CLARA profile and their anonymised data were available for analysis.

Data Analysis and Ethics

The focus groups and semi-structured interviews were analysed thematically and summarised to provide illustrations of the nature of student and tutor experiences and to give examples of their thoughts. The quantitative data for pre and post CLARA profiles was exported, collated and analysed. Descriptive statistics were used to profile the population in terms of learning power dimensions, comparison of means was used to explore differences between groups, and differences between pre and post CLARA profiles. Cluster analysis was performed in order to explore patterns in the student data. This project was approved by the UTS ethics committee.Students were de-identified in the students' aggregated CLARA quantitative data.

How CLARA was used in learning and teaching

Students were prepared through discussion in class, or flipped learning opportunities, to think about learning before completing their CLARA profiles online. They were given the opportunity to engage in structured peer coaching conversations and invited to set challenging 'stretch' targets for change. In some cohorts, learning power assessment was integrated into the formal curriculum through problem based projects.

Qualitative Findings

Overall, students found the CLARA experience to be positive, and staff see great potential in the use of CLARA, believing that it enhances graduate capability and lifelong learning and self-reflection for the students, and helps students to take ownership of their learning. While we draw encouragement from the many positive reports, the interviews uncovered a number of challenges:

- **Integration of CLARA into the curriculum:** If CLARA is perceived (by students or tutors) as a 'bolt-on' that is not obviously connected to what is being learnt, and/or how it is being taught this damages how seriously it is taken. Subject pedagogies and curricula were modified in varying degrees to integrate CLARA. Feedback requested greater clarity in the language of CLARA's dimensions, especially the ease with which one could apply it to one's specific subject and profession. The personas and resources need translating into subject-specific language and strategies for change. Related to this point:
- **Timing of CLARA for different cohorts:** Final year Capstone Masters students complained that they should have been given access to CLARA at the start of their degrees, while many first Science undergraduates may have been too fresh from high school, and too insecure in their first year, to be ready to contemplate their weaknesses.
- **Maturity level of the students to undertake such reflection:** e.g. mature Nursing students returning to academic study were generally positive about CLARA, as were the Year 2-4 Science students who were trained to mentor Year 1's.
- **The subjective nature of self-report:** Particularly in the science cohorts, students familiar only with objective measurement of the natural world questioned how self-report can be taken as a reliable measure. From one perspective this is a valid critique (triangulation of data is important), but dismissal of self-report is also due to unfamiliarity with the use of self-report as a source of insight in the social sciences. Students who valued CLARA recognised that feeding back one's own answers to the survey questions

can provoke useful reflection and action. Clearly, we need to develop better ways of introducing such tools to the more technical disciplines.

- **Staff expertise with CLARA:** Students recognised that some tutors were not expert with CLARA, which is a challenge when any new learning tool is introduced. Resource constraints meant that staff induction could have been better.
- **The need for systematic CLARA support across the University:** Staff commented that introducing CLARA came at the cost of their time and energy, and that while they were enthusiastic about its potential, academic support from the senior CLARA academic and logistical support from a research assistant was invaluable in the pilots. Without this, there was the risk that it would not be sustained.
- **Poor feedback in student satisfaction surveys:** When students did not appreciate CLARA for any of the above reasons, ratings for a subject were at risk of dropping.

Summary of Quantitative Findings

Differences between discipline (faculty) groups: A one way Anova computation demonstrated significant differences between the discipline and faulty groups. In general undergraduate students in science and engineering were more fragile and dependent learners compared to post graduate mature students.
Patterns of Learning Power: A K-Means Cluster Analysis demonstrated the presence of significantly different groups of students. Specifically it was possible to identify those students most 'at risk' as well as groups of 'fragile' high achievers and students who had very little sense of 'belonging' but who were motivated to learn.
Changes in Learning Power Profiles after Learning Power Interventions: For the 921 students there was post-profile data. The data demonstrates that there were significant positive changes on all 8 learning power dimensions for those students.

Discussion and Conclusions

This study suggests that the use of the CLARA Learning Power Profiles across UTS between 2015 and 2016 has generated significant value for tutors and students throughout the process. Its primary value is in providing a framework for self-directed change in approaches to learning and employability skills for students. Although the qualitative data were not comprehensive enough to make claims of significance or transferability, there is every indication that students and tutors found the experience valuable – with one caveat from some first year science students who sometimes did not understand the purpose of CLARA. The use of CLARA Learning Power profiles provided a language, a pedagogical framework and rapid-report data for developing students' awareness and ownership of their own learning, and their ability to become self-directed, reflexive learners. It provided a language and focus for tutors to foreground learning-how-to-learn capabilities within the 'normal' curriculum. The eight learning power dimensions support self-directed learning and enhance the development of graduate employability skills, such as entrepreneurship, collaboration, creativity and complex problem solving capabilities.

Implications for Learning Futures practices

- A system wide, structured approach will be required if these practices are to be sustained and embedded. This includes developing learning experts and data experts,

and being able to manage data collection to best advantage for ongoing rapid analytics feedback to tutors and data analysis for leaders and research.

- Reflexive writing is a key strategy for change in strengthening learning power which can be embedded in assessment practices and supported by writing analytics.
- Developing a culture of coaching as the core learning relationship is key to embedding learning power capability. This has organizational implications and can be a focus for exploring how learning analytics can support this online and offline.
- CLARA is best integrated in contexts where students' encounter with the formal funds of knowledge is through open ended enquiry and complex problem solving in a particular domain. This requires significant expertise on the part of tutors.

Proposed STARS audience engagement

Delegates will be provided with a summary of CLARA's dimensions, and invited to consider the following questions in groups: *In what contexts could you see CLARA adding value at your institution? What challenges would you anticipate, and can they be mitigated? If we now have the technology track students development as resilient learners in close to real time what are the ethical implications for Universities?*

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Biographies

Professor Ruth Deakin Crick started in teaching and school leadership and in 2000 she moved into academia. Ruth is one of the originators of a self-assessment tool for strengthening self-directed change in learning power: the CLARA (Crick Learning for Resilient Agency profile). Ruth divides her time between the Institute for Sustainable Futures, in UTS Sydney and the University of Bristol, UK, where she works in teaching, engagement and research around the CLARA and other processes of learning, adaptation and feedback.

Mingming Cheng is a final stage PhD student who worked at the University of Technology Sydney but is now a lecturer at the Department of Tourism at the University of Otago. His core research interests and expertise deal with Chinese generation Y, outbound Chinese tourists, tourism marketing, sharing economy and inter-disciplinary research. He has a particular interest in big data and got involved in the CLARA project after doing the CLARA as a student.

Simon Buckingham Shum is Professor of Learning Informatics, and Director of the **Connected Intelligence Centre** (CIC). CIC works at the intersection of research and teaching/learning, to break new ground in the use of data and analytics within UTS to improve the student experience. \

Georgina Barratt-See manages the UTS U:PASS (UTS Peer Assisted Study Success) program, which assists students in 60 first and second year subjects with study sessions run by trained student facilitators. Georgina has over 17 years' experience in the Higher Education sector with interests in student leadership, mentoring, first year experience, teaching and learning. Since 2014, she has enjoyed doing training and assisting with research in the CLARA project.