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**Cognitive Playfulness, Creative Capacity and Generation ‘C’ learners**  
**Jennifer Pei-Ling Tan and Erica McWilliam**

***Abstract***

This paper draws on an ongoing doctoral study of student engagement with new digital media technologies in a formal schooling environment to demonstrate the importance of *playfulness* as a learning disposition. The study shows that *cognitive playfulness* mobilises productive engagement with learning innovations in the context of a traditional learning culture. Specifically, the paper discusses findings that emerge from a quantitative study into the level of student engagement with, and usage of, one school’s digital innovation in the form of a new Student Media Centre (SMC). The study analysed how different student learning dispositions influence the extent to which students engage with new digital technologies in the context of their otherwise traditional schooling. What emerges from the study is the interesting finding that *cognitive playfulness*, defined as ‘the learner’s dexterity and agility in terms of intellectual curiosity and imagination/creativity’, is a key factor in predicting students’ valuing of the opportunities that Web 2.0 open-source digital learning affords. In presenting an empirical validation of this finding, the paper contributes new knowledge to the problematic relationship between *student-led digitally-enhanced learning* and *formal academic schooling*.

***Cognitive Playfulness, Creative Capacity and Generation ‘C’ learners***

*Play* is a much misunderstood and trivialised human action. Rather than being the antithesis of work, it is the sort of progressive, imaginative, self-interested, ritualistic, frivolous, carnivalesque and cosmic activity that allows us to be “energetic, imaginative and confident in the face of an unpredictable, contestive, emergent world” (Kane, 2004, p. 63). Education has been unable to understand or endorse the value of “the play ethic” because it has, according to Kane (2004, p. 75), “slipped between a Romantic and a utilitarian model” of play, dividing off “rational and irrational recreations”. In doing so it has disallowed - and disavowed – the value of play as a ‘multi-literacy’ for 21<sup>st</sup> century life and work.

This paper draws on an ongoing doctoral study of student engagement with digital technologies in a formal schooling environment to indicate the importance of *playfulness* as a learning disposition that mobilises productive engagement with new learning innovations despite the restrictions of a traditional learning culture. The study examines the relationship between *student-led digitally-enhanced learning* and *formal academic schooling*, as it is experienced by students and teachers in a long-established, well-resourced and high-performing senior schooling environment. In so doing, it explores the ways students and teachers engage with a student-led online learning initiative in the school, as a result of the differential value, legitimacy and priority they give to particular modes of learning and literacy practices, goal orientations and school achievement.

While the study takes a multi-level approach to understanding innovation adoption and diffusion within the formal schooling environment context, the scope of this paper concentrates on the individual micro level analysis of the phenomenon. At this level of analysis, the study explores student personal experience and attitudes, modes of learning and issues of identity. The focus is on the individual learning dispositions of nearly 500 senior school students, and how their personal constructs influence the students’ evaluation of and engagement with a multimodal Web2.0 open-source, community-based digital learning innovation, namely, the school’s Student Media Centre (SMC).

The SMC was set up by the school in 2006 with the specific purpose of engaging the whole senior school student population in flexible networked digital learning that extends beyond conventional classroom pedagogies and traditional literacies, in order to develop autonomous and leaderly dispositions, as well as creative capacities in relation to student learning. The study analysed the role that student learning dispositions played in determining the extent to which students consider the SMC to be relevant for their living and learning, and therefore, choose to engage with it as a non-traditional or informal learning context. What emerges from the study is the interesting finding that *cognitive playfulness*, defined as ‘the learner’s dexterity and agility in terms of intellectual curiosity and imagination/creativity’, was a key factor in predicting students’ valuing of the opportunities SMC presented and their level of engagement with and usage of the innovation.

Before moving to the findings of the quantitative study in more detail, it is useful to understand what is meant by a learning disposition. It is understandable that many educators and non-educators see a learning disposition as synonymous with the disposition to academic achievement. However, social psychological researcher and educator, Carol Dweck, makes a clear distinction between the two, indicating that *learning goals* are very different from, and often in conflict with *performance goals*. As she puts it, an individual’s performance goals are focused on “winning positive judgment of your competence and avoiding negative ones”, while an individual’s learning goals are characterised by a desire to develop “new skills, master new tasks or understand new things” (Dweck, 2000, p. 15).

In Dweck’s research on the performance and learning activities of young people, performance goals and learning goals were found to be present in most of these individuals in about a 50/50 ratio. They can, however, be manipulated by external social conditions or an influential significant ‘other’ (eg, a parent, trainer or teacher). When this occurs, the students for whom learning goals are paramount continue to seek new strategies and to tolerate error without self-blame, while those who are performance-driven are more likely to give up on the task set, berating themselves for their inability to complete it. In other words, although both types of goals can lead to high achievement, generally, *learning goals-oriented* individuals tend to exhibit more adaptive responses to complexities and challenges, which is characteristic of our postmillennial creative economy, while *performance goals-oriented* individuals have a higher tendency to feel overwhelmed by their inability to ‘get the right answer’ and experience intellectual paralysis in the face of challenging problems that encompass multiplicity and ambiguity.

In practice, this means that a student who was being encouraged to learn juggling might, if healthily learning-oriented, approach the task by considering a number of strategies. They might appropriately decide that listening to a lecture on juggling might not be as useful as trial and error attempts with just two balls. Once they feel competent with two, they may move to three. When they drop the balls, as they will frequently do, they know that the problem is that they have not yet had enough practice and that they will need regular prolonged rehearsals to acquire juggling skill. They do not think they are stupid for being unable to juggle. It is finding a successful strategy that matters.

As McWilliam (2008) has commented, it is much more useful for students to see this sort of strategizing as ‘serious play’ rather than hard work that can be done through routine thinking and doing. This disposition to *play* with ideas – to hold large numbers of associations together in the mind, and imagine the interesting possibilities that arise from making novel associations – is argued by Kane, Pink and others to be a key creative capacity (Kane 2004; Pink 2005; Florida 2003). As explained by psychologist Teresa Amabile and her colleagues (2002, p. 53):

It's as if the mind is throwing a bunch of balls into the cognitive space, juggling them around until they collide in interesting ways. The process has a certain playful quality to it....If associations are made between concepts that are rarely combined – that is, if the balls that don't normally come near each other collide – the ultimate novelty of the situation will be greater.

This capacity for serious intellectual play is what the [first author] calls 'cognitive playfulness'. Cognitively-playful individuals have a predisposition to curiosity, inventiveness and the desire to play with novel ideas and innovations, and this can result in increased levels of personal innovativeness and individual learning. In the study, *cognitive playfulness*, understood in terms of two dimensions, *intellectual curiosity* (or level of *inquisitiveness*) and *intellectual creativity* (or level of *imagination* and *spontaneity*), emerged as highly significant in explaining the extent to which students appreciate the SMC and engage with it for extending their learning in school.

The discussion now focuses more squarely on the empirical evidence that demonstrates the importance of *cognitive playfulness* as a knowledge object that is imperative to the ongoing development of creative human capital in this current 'Conceptual Age' (Pink 2005).

### ***Findings from the study***

The research design and mode of data collection in the study that is relevant to this paper comprised an extensive quantitative self-reported student questionnaire administered to the senior school student population of approximately 600 students. This student questionnaire was implemented in mid-2007, by which time the SMC had been in operation for approximately one year, and it achieved a remarkably high response rate of 93%. The numeric data from the questionnaire pertinent to this paper include socio-psychological scales that measure students' learning dispositions (including their *achievement goal orientations*, levels of *cognitive playfulness* and *personal innovativeness*) and their usage behaviours related to the SMC, in terms of volume and frequency of use.

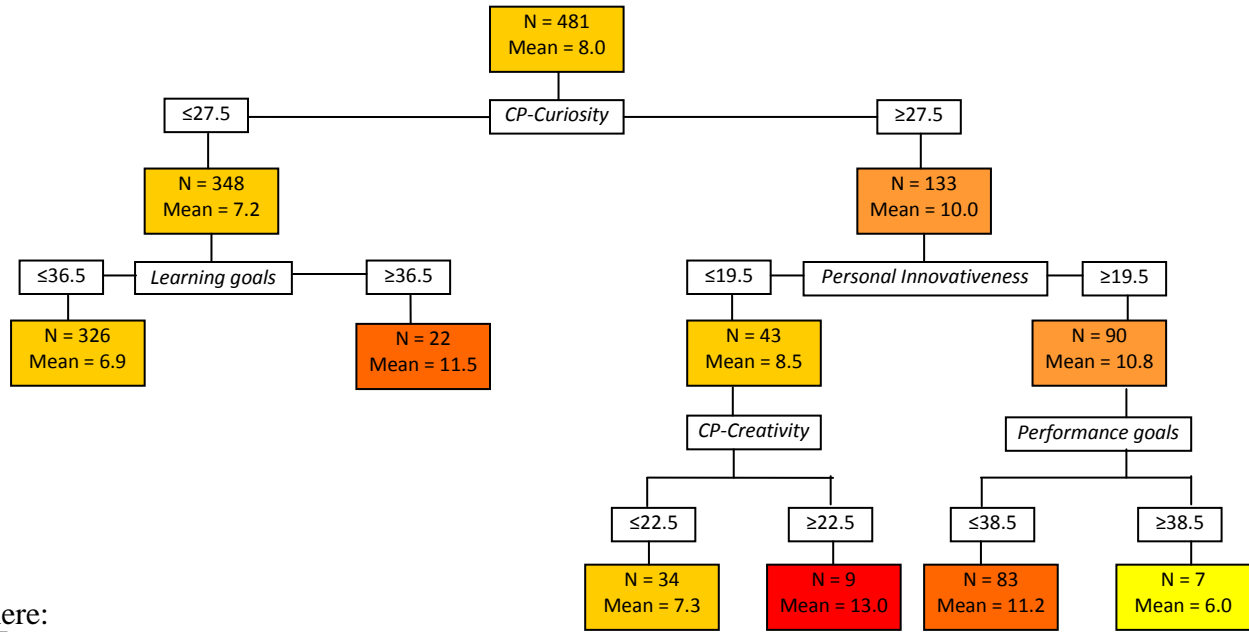
A Classification and Regression Tree (CART) technique of analysis<sup>1</sup> was used, as developed by Briemann and colleagues (1984) more than two decades ago for predictive modelling of non-parametric datasets that is widely used in fields as diverse as econometrics, finance and banking, international relations and social welfare policy (Bridgstock 2007; Yohannes & Webb, 1999; Furnkrantz et al, 1997; Gibb et al, 1993). This statistical technique allowed analysis of the relationships between students' *learning dispositions* (predictor variables) and their levels of *usage* of the SMC (target variable). The learning dispositions measured include *learning and performance goals* and *cognitive playfulness*, as well as *personal innovativeness*, which is in turn closely related to the concept of *cognitive playfulness* and commonly defined as 'one's willingness to change, an openness to new experiences and the propensity to go out of one's way to experience different and novel stimuli particularly of the meaningful sort' (see, for example, Leavitt and Walton 1975; Hurt et al, 1977; Rogers 1995). Measurement scales incorporated self-developed items as well as adapted items from previously validated studies in the field, and reported strong reliability and validity test results<sup>1</sup>.

Figure 1 provides a visual representation of the decision tree modelling results that demonstrate the extent to which learning dispositions influence the students' usage of the SMC to further their learning opportunities and extend their learning experiences in school. An interpretation/discussion of these results follows.

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<sup>1</sup> A detailed discussion of the CART statistical technique, as well as scale validation procedures and results are beyond the scope of this paper but can be made available to interested readers on request.

Figure 1 - Optimal Decision Tree 1: Individual Learning Dispositions (predictors) and SMC Usage (target)



Where:

- Mean SMC Usage ≤ 6.0 (very low)
- Mean SMC Usage ≥ 6.1 but ≤ 8.5 (moderately low)
- Mean SMC Usage ≥ 8.6 but ≤ 11.0 (moderate)
- Mean SMC Usage ≥ 11.1 but ≤ 12.9 (moderately high)
- Mean SMC Usage ≥ 13.0 (high)

Model  $R^2 = 25.0\%$

The optimal decision tree predicting SMC usage demonstrate a reasonable level of explanatory power, where the predictor variables explain about 25% of the variance in the target variable<sup>2</sup>. Results of the decision tree model can be interpreted as follows.

First and most importantly, as shown in Figure 1, *cognitive playfulness* in terms of *intellectual curiosity* emerged as the primary splitter variable and *strongest predictor* of SMC usage. In other words, students that exhibit higher levels of intellectual inquisitiveness, which is a learning disposition that causes them to ‘explore and *play* with a problem until it is solved’ (Glynn & Webster 1993; Dunn 2004) are most likely to engage with the SMC learning innovation to a large extent, when compared with the general student population. Second, students who exhibit *higher levels of cognitive playfulness* in terms of *both* intellectual curiosity and intellectual creativity, relative to their peers, emerge as the learner category that reports the *highest usage* of the SMC (mean=13.0). On the other hand, students who report low levels of engagement with the SMC (mean=6.0; 7.2; 7.3) exhibit relatively low levels

<sup>2</sup> In the field of innovation adoption and diffusion studies where the target variable measures *actual usage* rather than the *usage intentions*, this  $R^2$  value of 25% represents a reasonably significant percentage of variance explained in the target variable, particularly when only individual-level factors have been taken into consideration for the purpose of this paper. In comparison, a landmark innovation adoption predictive model proposed by Chwelos and Benbasat (2001) which considered a range of individual, technological and institutional factors reported an  $R^2$  value of 32%, which is marginally higher than that reported in the decision tree model discussed in this paper. The full predictive model of innovation usage developed and tested in the doctoral study incorporating systemic factors reported an  $R^2$  value of 54%.

of *cognitive playfulness* (both intellectual curiosity and creativity) and *learning goals-orientation*. This finding underscores the importance of cognitive playfulness as a learning disposition that motivates individuals to engage with and embrace novel situations and inventions put before them, in turn a propensity that represents a vital component of creative capacity.

Two other interesting trends emerge from the decision tree modelling results, which call attention to the value of being healthily learning-oriented rather than *merely* performance-focused. Specifically, the profile of the lowest SMC user-group (mean=6.0) suggest that despite possessing an above-average level of cognitive playfulness and personal innovativeness, if an individual tends towards being highly performance-driven, the tendency to ‘perform’ may overwhelm the former learning dispositions, in turn acting as a barrier to the individual’s capacity to experiment with new ideas, innovations and learning opportunities. On the contrary, as indicated by the profile results of the second-highest SMC user-group (mean=11.5), individuals who may not be particularly dexterous or agile in the cognitive domain but exhibit robust levels of learning-orientation, may nonetheless be open to experiencing new ways of living and learning by engaging with innovative technologies available to them.

Put simply, individuals who are intrinsically motivated to learn new things and acquire new skills are likely to appreciate the opportunities presented by new innovations such as the SMC to extend their range of abilities and competencies. By contrast, individuals who are primarily focused on ‘getting the right answer’ and winning positive judgments of their competence, while avoiding ‘looking dumb’ are likely to resist experimenting with such contemporary learning technologies, if they appear to be ‘outside’ traditional pedagogical expectations and structures. This resistance or unwillingness to take on new ways of learning and engaging may bring with it potentially adverse consequences, including the possibility of becoming the ‘marginalised citizens’ of the 21st century digital-age lifeworlds.

### ***So What?***

While the quantitative findings discussed above are not generalisable to all digitally-enhanced learning innovations in school settings, given that the study was conducted in only one specific formal schooling environment, some important theoretical understandings and insights can nonetheless be drawn. *Cognitive playfulness* does seem to be significant as a learning disposition that promotes creative capacity in terms of a willingness to experiment with new ideas and engage with innovations. The study also appears to indicate that, where learning goals wither in relation to performance goals, then it is less likely that the disposition to ‘be creative’ (ie, to play with novel ideas in novel ways to achieve novel ends) will be forthcoming. Conversely, where learning goals are robust in relation to performance goals, then strategic thinking, and therefore, *cognitive playfulness*, is a more likely outcome. With this in mind, it should not be simply assumed that Gen ‘C’, as a distinct group of young people in this digital-age, are innately ‘C’reative, ‘C’ommunity-oriented and ‘C’ontent-driven (Trendwatching 2004; Ahonen & Moore 2005; Bruns et al, 2007). The study’s findings on the individual dispositions of senior school students challenge these assumptions and understandings by calling attention to the fact that many young people may exhibit all the typical Gen C characteristics of being highly-resourced, technologically-savvy and digitally-literate; however, if they develop or work out of learning dispositions that are predominantly *performance-oriented* rather than *learning-oriented*, and if they lack a capacity for *cognitive playfulness* in terms of intellectual dexterity and agility, then these young people may not be able to value-add to creative output. Perhaps, in addition to creative, community-oriented and content-driven, the ‘C’ in Gen C might only be optimal if it can embrace a capacity for ‘C’ognitive-playfulness.

In conclusion, this paper has argued the value of *cognitive playfulness* as a knowledge object that can be empirically investigated in terms of its value to building creative capacity in young people. The

significance of grounding cognitive playfulness empirically is that it makes it possible to move beyond creativity's reputation for 'vaporousness'. Rather than seeing *creative capacity* as an inexplicable phenomenon, the study shows that empirical rigor can be brought to bear on creative capacity and that we can therefore develop pedagogical strategies to build it systematically in young people. While *cognitive playfulness* is not the only disposition that makes for high creative capacity, findings from the study empirically demonstrate it to be a very important factor in terms of students' preparedness to engage with new technologies in new ways for learning ends, some of which may be non-traditional. Methodologically, the study is an example of how traditional quantitative methods can be brought to bear in ways that *serve* the creativity project, rather than doing it a disservice. It is not argued that all creativity is amenable to such analysis; merely that mainstream social science can be enrolled in positive ways to throw new light on the thorny questions that continue to bedevil researchers in the field of creative capacity building.

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