ICT AS INTERACTIVE CREATIVE TECHNOLOGIES:
RECONCEPTUALISING THE PEDAGOGY OF TECHNOLOGY IN
CONTEMPORARY CLASSROOMS

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Abstract
Technology use in society has paved a new landscape for pedagogical practices in classrooms. In
learning situations today’s youth, or the ‘net’ generation as they are often described, thrive on the
utility of technology, creativity, social interaction and community (Nichols, 2007) which has enabled
them to develop new ways of interacting and communicating. In student’s social lives in particular,
community writing practices have generated capacities for producing different kinds of texts which
challenge traditional pedagogical practices and understandings of meaning making and
communication. With the ubiquitous presence of technology in the textual lives of people, writing
practices and pedagogy need to be revisited. This paper explores how the ranges of technologies and
technoliterate practices have generated new possibilities for interactivity and creativity in multimodal
text construction in classrooms. This in itself calls for a reconceptualisation of the term ICT, familiarly
referred as Information Communication Technology. To be relevant in today's classrooms, the paper
introduces ICT as ‘Interactive Creative Technologies’ as a way to represent the rich, multi-faceted
nature of literacy, technology and pedagogy as contemporary technoliterate practices move beyond
information and communication. This paper specifically presents research exploring the changed
nature of the pedagogy of technology; in particular it looks at writing practices as design, creativity and
technology converge in practice to change the face of classroom interactions around text production.
Practical classroom examples and accounts from teachers and students, drawn from an 18 month
case study, will be presented. These describe how seventeen teachers from six schools adjusted their
pedagogical practices to develop capacities for enabling students to create new and dynamic texts.

Keywords: creativity, design elements, interaction, multimodal writing process, pedagogy of
technology, technoliteracies.

INTRODUCTION

‘Teaching now requires more flexibility as students need to have more choice, more
freedom, more time to talk and collaborate with peers and play around with the ideas
and the technology.’ Mr Santos, Year 5/6 Classroom Teacher

Classroom practices are increasingly becoming saturated with technology. From the internet, to
interactive whiteboards, digital cameras and videos to computers, technology is taken up in lessons
with varying degrees of use and relevance. The increasing interplay between technology and
teaching, and the expectation that this occurs in integrated, meaningful and seamless ways, poses
critical questions about how we understand the pedagogy of technology. In particular, questions
concerning what kinds of changes might technology bring to pedagogical practices in everyday
teaching and learning require close scrutiny. In addressing these questions, what is specifically
underlined is the need to turn attention to the realities of the situated encounters between pedagogy
and technology in classrooms.

In their everyday world, students demonstrate new ways of being social and new ways of being literate
as they interpret and construct new types of texts using a range of technologies. In their world they are
technoliterate. As a result, students demonstrate new creativities, new socialities and new
technological capacities which force traditional understandings and practices of pedagogy to be re-
visited for their validity and relevance in today’s classrooms. Furthermore, as we move further into
unbounded learning spaces, no longer privileged by print based pedagogies, the need for student
collaboration and interactivity in classrooms is signified particularly since today’s students thrive on the
utility of technology, creativity, social interaction and community (Nichols, 2007). This implies questioning the pedagogies of technology both in relation to their validity and relevance and the potential repercussions of Information Communication Technology, familiarly referred to (ICT), on the opening up of the classroom as well as on the social interactions that occur between teachers and students (Tardif, 2005). Mr. Santos’s comment (above) reminds us of the significance of the interconnection between pedagogy and technology and how new ways of interacting, communicating and creating, brought about by evolving technology practices, challenge teachers to encompass new social and textual practices in contemporary learning situations.

It is well established that working within this evolving social and technological landscape, technology use in classrooms necessitates a more collaborative approach between teachers and students (Matthewman, 2003). Past research has recognised that irrespective of teaching, student out-of-school practices encompass a wide repertoire of technological practices enacted in a variety of often sophisticated, complex, and extensively communicative ways (Canola, De Laat, Dillon & Darby, 2006). This in itself calls for a reconceptualisation of the term ICT. In contemporary times, ICT use moves beyond a focus on information and communication, and so in this paper it is proposed that to be relevant in today’s classrooms, the term ICT needs to reflect the sociality and creativity that technology use enables. In addition, ICT use needs to represent the rich, multi-faceted nature of literacy, technology and pedagogy. Reconceptualising ICT as ‘Interactive Creative Technologies’ opens up a contemporary position which reflects technology use in classrooms to be essentially about pedagogy (the teaching and learning).

In the midst of a raft of research findings, administrative policies, professional development (PD) offerings, along with a proliferation of available professional resources, teachers are increasingly aware of the expectation that classroom practices not only align with current and up-to-date technological practices, but that technology be applied as a process to enhance learning rather than be used as a single, isolated and discrete activity. Furthermore, this plethora of educational literature offering rationales, suggestions, methods and frameworks for teaching in a digital age providing teachers with imperatives or inspiring success stories, ideal models and interesting examples of potential uses of technology integration in classrooms settings provoke a range of personal and practical challenges and dilemmas for many teachers. Pressure to change their pedagogy overwhelms, constrains, and even, burdens professional action as they struggle with their in-reality power. Some teachers fear losing control of content delivery (Goldman & Hocking, 1999). And many others find themselves remaining on insecure ground as they grapple with authentic and practical ways to ‘actually’ transform the pedagogy of technology in their own circumstances. How teachers take on new pedagogies in this landscape is a critical issue for education.

**INTERACTIVITY, TECHNOLOGY AND TEACHING: ICT AND PEDAGOGY**

‘I loved writing and designing the video, it was so interesting and fun. We have more say in some of the stuff, our work is better quality when we work together, because we have to discuss it and work it out together, the ideas get even better, you know, we sort of have to listen to each other and we can even get their point of view, so it’s got to be better.’ Jonno, 11 Years

Classrooms provide the interactive and physical context for student learning. At the fundamental level of pedagogy, teachers and students create, through interaction, the social classroom context on which they rely to support instructional talk (Edwards & Furlong, 1979). And so as technologies enter the classroom space, its use does not occur in a vacuum but within the context of interactions centred on learning. The significance of these interactions (between students, between teachers and students, and between teachers, students and technologies) cannot be underestimated; they serve to define the context in which they interact, shaping the pedagogies enacted in that context. The practical question for teachers taken up in this paper is what this looks like in classroom lessons designed to integrate technology.

What technologies to use, how we use it and how well we use it, are main issues that have led to decades of widespread research and debate. The perennial recurrence of the debate suggests that perhaps pedagogy and technology have not been perceived as an interrelated issue. In their paper ‘The pedagogy of technology’, Okojie, Olinzock, and Okojie-Boulder (2006), cautioned that the reality in many classrooms is that;
‘technology integration remains narrowly perceived, often taken to as an object exclusive to itself restricted to the mechanical application of various hardware and software devices during the process of instruction, rather than taken as an integral part of instruction.’ (p1).

The significance of technology use in classrooms therefore lies not in what a device or artefact ‘is’, nor in what it specifically does, but in what it enables or affords as it mediates the relationship between it user and other individuals (Hutchby & Moran-Ellis, 2001). Simply, the scope of technology integration requires close examination with a view of showing teachers its relationship with pedagogy by examining what it enables or affords interactively.

Working with technology necessitates a more collaborative approach between teachers and students around textual practices (Sharples & Bruce, 1996; Matthewman, 2003), as 11 year old Jonno implies above. In recent research, for example, it was found that the success of student writing and text production actually hinged on the interpersonal interactions they encountered with peers (Edwards-Groves, 2010). And so, the pedagogy of technology requires opportunities for flexibly interacting with each other (Lewis, 2005), not simply with the technology and within on-line environments. In this paper the notion of interactivity therefore accounts for the significance of the interpersonal interactions around text and text construction as students engage in learning opportunities which utilise technologies rather than locating the term, more narrowly, with the interactive capacities of the media itself (Apperley, 2010) as it is typically viewed. This view shifts the focus to be about pedagogy and practice rather than simply about the technology itself. Therefore, using technology to enhance the educational process involves more than just learning how to use specific piece of hardware and software, it requires an understanding of pedagogical principles that are specific to the use of technology in instructional settings (Diaz & Bontembal, 2000). The place of technologies in constituting social relationships and networks in classrooms need not obscure the pedagogical purposes.

CREATIVITY, TECHNOLOGY AND TEACHING

‘I found that technology allows students to be more creative as they work together and share ideas, the whole place seemed to have a different vibe and buzz..’ Miss Wheeler, Yr4/5 Teacher

It is a long held position that it is a right for all children to experience classrooms learning environments which cultivate and value creativity (Guilford, 1967). Creativity is learning at its deepest and most powerful (Claxton, 2003) and requires contemporary learning spaces to both harness and liberate the creative energy of today’s youth (Florida, 2005). As suggested by Miss Wheeler (above), technological resources are a medium through which these important dimensions of student's creative abilities can be stimulated and augmented (Lewis, 2005), elevating creativity to prominence in contemporary classroom practice. A socio-cultural view of creativity suggests that creativity is a dynamic composition of and interaction between individual, societal and environmental factors (Lewis, 2005). This view binds together pedagogy and technology, creativity and interaction. And further since contemporary classroom practices are expected to facilitate and nourish creativity (Nichols, 2007), the ‘explicit use of creativity oriented teaching is necessary to extend students range of understandings, skills and knowledge and to share and access multiple textual meanings’ (Hall, 2010, p290).

Pedagogy today requires a renewed focus on overtly supporting, sustaining and enhancing student's creative possibilities as the medium of technology offers new opportunities for designing, producing and present multimodal texts as representations of learning for all age levels (Edwards-Groves, 2010). In a recent review of research examining creativity, learning and technology, Nichols (2007) identified four interdependently functioning factors which support the ‘creativity support system’ necessary for enhancing student’s creative possibilities. According to her results, pedagogy must take account of:

1. resources (incorporating and enabling idea time, idea support, challenge and involvement, sufficient functioning resources);
2. motivation (incorporating and enabling interdependence, trust and openness, tolerance for uncertainty and ambiguity, playfulness and humour, conflict);
3. exploration (incorporating and enabling risk taking, debate, freedom, reflection); and,
4. sociality (incorporating and enabling supervisory arrangements, work group supports, team work and collaboration, community). (Nichols, 2007, p68).
How these factors work interdependently to scaffold and shape interactions around learning and technology within a creativity rich learning environment is an important question for the pedagogy of technology.

TECHNOLOGY, TEXT PRODUCTION AND TEACHING

‘For many of these students writing was always boring, a chore, but the fact they were presenting their research using the video story seemed to get them inspired to even work together like I haven’t seen before.’ Mr Santos, Yr5/6 Teacher

For today’s youth learning new practices requires ‘spaced practice’ (Kellogg, 2008) as they flexibly practise new practices in a way that is ongoing, over time and overtly connects virtual spaces and physical-time spaces (Schatzki, 2010). The classroom needs become one of the authentic spaces students inhibit as they engage in classroom learning. These textual practices demonstrate creativity, social networking and technical complexities which reshape traditional understandings of text analysis, meaning making and communication (Canola, De Laat, Dillon & Darby, 2006). These practices, shaped and mediated through technology, allows users to engage with new social and technoliterate practices which have enabled them to become ‘multimodal designers of text’ (Edwards-Groves, 2010). No longer is it sufficient to accept that computers be used to simply ‘type up student writing for publishing’ or to engage in digital colouring-in activities for example. Technology use essentially must offer teachers scope for expanding both the repertoire of literacy practices and social interactions (Van Scoter, Ellis & Railsback, 2001) whilst enabling the “critical engagement” with multimodal discourses (The New London Group 1996, p. 67).

Texts in contemporary times are both dynamic and multidimensional; and so a focus on writing and text construction requires a position which brings to bear new pedagogies which are inextricably connected with ICT. In one way it is imperative that writing lessons pay attention to the ways they visibly and explicitly connect to these new ways of interacting and communicating. Collaborative dialogues about text construction and multimodal teaching (Kress & van Leeuwen, 1996) presents a new pedagogical backdrop for designing, producing and presenting oral, written and visual texts in today’s classrooms (Edwards-Groves, 2010). The research reported by Edwards-Groves (2010) proposes that producing texts in classrooms involves preparing and designing a multiplicity of texts requiring a recursive movement between and across phases of writing in a non-linear way. Described as the multimodal writing process (Edwards-Groves, 2010), composing text or writing now encompasses attention to design, production and presentation utilising new technologies with an explicit knowledge and application of the ‘elements of design’ (Kalantzis & Cope, 2005).

THE STUDY

The paper brings together results of empirical research conducted in a rural region in NSW Australia conducted over 18 month period. The overall project involved 17 classroom teacher participants (from six school sites). Data were gathered using a range of qualitative methods which aimed to build a picture of participant’s experiences and pedagogies within their own contexts. This included:

- participant observation of classroom teaching (as teachers and facilitators demonstrated lessons for group members with the aim of sharing and strengthening expertise);
- participant observation of professional development sessions with teachers and consultants;
- semi-structured surveys (17 teachers and 2 consultants);
- in-depth semi-structured teacher interviews with the five teachers; and,
- a student focus group interview (6 students aged 10-11 years) was conducted with a random sample of students from one class.

Field notes were taken and selected sessions were audio-taped or video-taped. Transcripts of audi-taped interviews and videoed professional learning sessions, field notes and survey responses were carefully analysed to determine recurrent themes.

The research examined how, and in what ways, teachers adjusted their pedagogical practices as they were supported through a long term professional development to project aiming to facilitate integration of technology in lessons. This paper focuses on the pedagogy of technology observed within the
context of writing lessons. In this research site many of these teachers initially believed their own capacity (or lack thereof) with technology acted as a barrier for expanding their own repertoire of technoliterate practice and so constrained what was possible in their classrooms. They conceded early in the study that computers were the main device used and these were mainly used for typing up stories, for playing games, an occasional Google search or PowerPoint presentation.

**FINDINGS**

If we look through the door of any classroom, what do we notice to be going on? What lessons are taking place? What technologies are being used? How are they being drawn into the learningscape of the classroom? Although on the surface these appear to be quite banal questions, looking deeply and critically at the practices unfolding in action (through transcripts) enables deeper understandings about the pedagogy of technology to be gleaned. The paper focuses on the findings from one particular school site selected for in-depth case analysis, and draws on semi-structured interviews (recorded and transcribed) with 5 teachers, classroom observations and the focus group interview. Practical classroom examples, transcripts and individual accounts from this setting form the basis of data presented in this paper. (Please note: all names are pseudonyms).

**TALKING AROUND TECHNOLOGY: CREATIVITY INTERACTIVITY AS FUNDAMENTAL TO THE PEDAGOGY OF TECHNOLOGY**

Classrooms provide the both interactive and physical context for school learning, whereby talk is at the core of the interpersonal, social and intellectual relationships between teachers and students within the context of the classroom. Analysis of lesson transcripts reveals how talk around technology is a pivotal dimension for integrating technology in meaningful ways, pointing to interaction as a fundamental characteristic of the pedagogy of technology. In the example below, as a part of a classroom writing project, the students were producing a video ‘tour’ of their local community using puppets to tell the story of the town history. The video was later uploaded to a website also designed by the students. In the following lesson excerpt, a group of students were engaging in talk about editing their video in the Moviemaker Program.

**Transcript 1:**

*Teacher:* Okay our focus here is to focus on working out the best way we get our message across to the people who will be watching our video tour. As you move into your groups to get on with the editing you will need to think about what elements you need to consider as you design each scene. Let's get to it ((Background chatter12.0)) Siting down everyone, in your groups ((Students moving to be in small groups)) Right, off you go/

*Annie:* First impressions, you always want your first impression to be the best, so a vibrant title slide would be/

*Nathan:* /We could be just more creative with the way be use photos at the beginning, you know use them with the movie/

*Tyler:* /we also need to think more about the transitions for each part of it and use a different creativity than when wrote out the script and put it on the poster.

*Mitchell:* We just could be more creative with the colours, use our imagination more but it has to still make sense you know.

*Lucas:* I like creating the one with the transitions and effects, let’s try to play with them a bit more/

*Mitchell:* /to see which one works the best to make it more interesting.

*Annie:* We still need to think about the words cause the colour has to suit the word otherwise it will sort of, you know, doesn’t make sense, it all has to fit together/

*Aiden:* it still has to introduce them, be eye-catching.

*Nathan:* And it also has to match the backgrounds doesn’t it? cause sometimes we have a dark colour on a dark background/

*Aiden:* /and you can’t see it.

*Nathan:* this is a new creative thing to think about, different to colouring-in coz we can play around with it on the computer to get the right thing/

*Rose:* /try it out, lot of ways, that’s fun
Jonno: We could try to put a bright colour on the dark colour on the background.
Rose: to suit the/
Nathan: /the effect. The effect and the impressions we want, we have to get that right on the first scene so we get the audience interested.
Tyler: If you make it on the paper first, try out the photos and everything first on a paper storyboard then go the Movie maker/
Annie: //but you can’t get the idea of the sounds, go straight to the Moviemaker so you can actually put music playing in the background and get the idea of the whole thing and everything. It’s like we have to think about it all together you know, we need to have new creativity now, it’s not simple and plain-
Tyler: Well it has to make sense, you can’t put an Elvis song with our video it wouldn’t fit, would it?

For these students talk around the technology was infused with talk around creating meaningful text and design. What we see from this segment is that for these students the lesson first and foremost is an evolving interactive process. Talk around technology demonstrates both interactional accomplishment and pedagogical accomplishment. However, as students interact around designing and editing their video, we are levered away from viewing technology use as a single discrete activity. What is revealed is that what counts for these students is engaging in the dialogue which aimed to create an interesting, vibrant text. What we see in this context is a highly visible complex set of interpersonal interactions that serve to assemble the social relationships between students around the creative enterprise made possible through the technology rather than keep the technology as the focus in and of itself.

For these students, talk shapes the context in which technology is an integral part. Transcript 1 clearly shows the value that pedagogical approaches are revealed through the interactions encountered in lessons. In this classroom the talk demonstrates that integrating technology requires interactive participation in talk around technology. In one sense, talk was not directly about the technology itself, although it was clear that technology was a crucial aspect of the lesson, importantly as a means to facilitate creativity. Both the teacher and the students recognised the role that interactivity has for learning in contemporary times. For example in the following interview extract, their teacher recognises the connection between interactivity and creativity as technology enters the classroom learningscape.

I think collaboration enables student creativity. It has to do with the dialogue; it was to do with the dialogue. Being able to provide different opportunities for students to connect up and talk about what is possible around ideas really let’s them fly. We can’t neglect this part of it when we use the technology actually. I have noticed that they thrive on making contributions to the group or the project; they’re walking together, but not necessarily on the same path at the same time, but they’re going in the same direction. (Mr Santos, Yr5/6 Teacher)

The social organisations and interactions reflected in Transcript 1, and in the comments by Mr Santos, bring technology into the learning space in a way which the teacher demonstrably prioritised dialogue and interaction over using technology as an activity. These students were enabled through a pedagogy of technology which visibly reflected interactivity and collaboration as they become acculturated into new ways of being literate in the world. For this teacher, and Miss Wheeler below, it is through the collaboration and interactions among students that they are enabled to enter new creative territory in the classroom.

We want to see the kids interact with the technology and with each other; we’re not just doing computers, we’re not bringing out the computer for the sake of bringing out computers, to do computers, its got to be about teaching, it’s the interaction with the computer and with each other actually so that they can keep their momentum of their learning going and get an even better outcome because of it. (Miss Wheeler, Yr 4/5/ Teacher)

This fundamental connection between collaboration, interaction and technology practices is taken further in this next excerpt.

‘utilising the co-operative learning strategies as a way to have students engage with most importantly their learning, and secondly with the technology requires students talk about and

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consult with others about their writing. These collaborations are an important way to foster meaningful talk that is focused on learning and even problem solving. .......for me with the age of the internet and on-line social networking we could be in danger of neglecting the importance of face-to-face interactions to learning and living.” (Mr Santos, Year 5/6 Teacher)

Mr Santos’ comments suggest two main points. Firstly, it is crucial that education (and society more broadly) not to lose sight of the value of interpersonal interactions. According to this teacher, these encounters are pivotal in effective engagement of technologies in classroom practices. From this perspective, we can take a deeper look at the notion of technology practices and make it more specific by saying that the pedagogy of technology is the collection of means used by the teacher to attain teaching goals in the context of educational interactions with and among students. From this, creativity emerges.

Interestingly, it was a conceptual focus also recognised by all the students in this class; these students were able to recognise how new interactive practices influence learning. In the following transcript excerpt taken from the student focus group, students (aged 10/11 years) discussed how the success of their work [to create a video tour of their local town] hinged on the interactions they encountered with their classmates from the beginning of the process.

Nellie: Well you can get more stuff done and if it’s just one person you usually just come up with 1 or 2 ideas but if you’ve got about 5 people they’ve all got different ideas and you can then work together and get a really good idea.
Lucas: Yeah, it’s better working in a team sometimes, sometimes we have issues but you actually solve them by having someone else to work with.
Sharna: Well, we had to be considerate and co-operate when making decisions.... if we didn’t do our bit then the whole thing wouldn’t work.
Nellie: Working [in teams] like we were allowed to do, we get to talk about our ideas more so it’s actually more productive, that we can actually produce more research or more ideas than we would by ourself
Jono: Yep better quality/
Lucas: /more efficient too, we get twice the amount of work done in half the time
Researcher: Better quality; tell me about that, it’s a good point.
Jonno: Well I mean [our work] is better quality because we have to discuss it and work it out together, the ideas get even better, you know, we sort of have to listen to each other and we can even get their point of view, so it’s got to be better.
Mikey: Yeah and we could talk about how to set it out on the video, the storyboards and that you know design it, the scenes//.
Timothy: //our ideas together is good, we learn to listen to each other and work together too, I even found out I liked to work with Mary, we had lots of good ideas together...it was fun.
(Note: transcript also used in Edwards-Groves, 2010)

This transcript is valuable in offering insights into student perceptions about the role of interaction in classroom learning and technology use. For this group of students classroom writing had changed and they were able to recognise it, account for it and evaluate it in terms of the benefits for their learning. For these students collaborating to write their video validated teamwork and collaboration as a critical influence on the process for creativity and for producing text. This transcript charts an important description of learning practices which equally serve to describe new writing practices and technological practices. Similarly, the principal comments below pose a striking proposition (which taken with those presented in the previous section), that interaction and collaboration lay an important foundation for efficacy in current times.

Effective technology use in our school is about working together at all levels, so it's not just all top down, it's sort of about collaborating and negotiating, and the kids really showed that they were able to run with that. We help each other here and I think that it is important for the kids to see that we [the teachers] are collaborating too, that way we are setting up new standards for interacting...you become more proficient and more creative with the application in lessons through playing with it [the technology] and working it out together. Just like discussing teaching ideas with other teachers is often a springboard for a better lesson, we need to model that in classrooms for our students. Having the time to play and practice when you need it is essential...we have become our own IT department for each other. (Mr Trainer, Principal)
These comments connect up notions of technology, interaction and creativity that place them uniquely together. In this setting as students and teachers were engaged in using technology, the range of literacy, technology and interactive practices students were required to participate in were intrinsically embedded throughout the lessons. Technological resources were the medium through which the important dimensions of student’s creative abilities were stimulated and augmented, but these could not happen in isolation, they hinged on the interactive experiences encountered in the classroom. Therefore, in classrooms such as the case described in this paper, new text construction practices and new ways of representing learning (through producing the video, for example) reveal important new pedagogies for the utility of technology in integrated, meaningful and seamless ways.

DISCUSSION: RECONCEPTUALISING ICT AS ‘INTERACTIVE CREATIVE TECHNOLOGIES’

The results described in the previous section highlight how changing technologies require changing education practices. Empirically, the paper charts the dynamic relationship between technology, interactivity and creativity as a foundational way to view pedagogical practices in contemporary classrooms. The research has shown that the practical challenge for teachers in everyday classroom life is bridging the practices of technology and the practices of pedagogy, so that technology use is not viewed as single, isolated and discrete activity. Participant accounts suggest that harnessing and extending student capacity within creative interactive learning spaces is a crucial goal for contemporary education; one that suggests that these notions go together inextricably in a reconceptualised pedagogy of technology.

It has long been argued that technology needs to facilitate learning as a part of the instructional process and not an appendage to be attached at any convenient stage during the course of instruction (Okieje, Olinzock, and Okoje-Boulder 2006), for example to type up students final writing drafts as ‘published texts’. To authentically integrate technology is not a matter of simply using the technology, but enacting a pedagogy which enables students to participate in processes that makes technology use integrated, meaningful and seamless. And as the results of this study gesture towards –it is possible if pedagogical practices put interactivity and creativity at the forefront of approaches as the prevalence and utility of technologies in classrooms escalates. When we focus on ICT in terms of interactivities and creativities, we keep in mind the importance of social and cultural competencies motivating students to bring technologies to contemporary learning situations. To do this we envisage for ourselves new pedagogies where the power of interaction is put firmly at the centre of the learning table. In this way it is imperative for lessons pay attention to the ways they visibly and explicitly connect to these new ways of interacting and communicating (Edwards-Groves, 2003).

It seems from the case presented that pedagogy for the 21st Century requires new practice architectures be designed to meet the requirements of a technological world demanding pedagogy retain currency and compatibility with new ways of interacting, creating and communicating. The teachers and students in this study highlight for us that this needs to be enacted in a way that overtly connects interaction with the pedagogy of technology. As shown, technology integration not only involves the inclusion of technical artifacts per se, but also includes developing and enacting consistency in theories about pedagogy and technology integration which aim to promote teaching and learning. The results provoke an argument for reconceptualising the term ICT as ‘Interactive Creative Technologies’ as a more inclusive way to account for the complex nature of contemporary pedagogy. A way which encompasses the view that learning spaces [using technology as a textual and social tool] need to account for:

1. **Interactivity** – negotiation, collaboration and interaction among students, between students and teachers, between students and localised or community enterprises, within on-line and/or technological spaces using a wide range of interactive strategies and arrangements.

2. **Creativity** – multimodal and creativity teaching providing a flexible and rich multiplicity of classroom opportunities which enable discovery, exploration and imagination, and the creative representations of learning through explicit knowledge and utility of the ‘design elements’ (Kalantzis, & Cope, 2005).

3. **Technologies** – encompassing a broad range of technologies (that go beyond considering technology to be solely associated with computers), the extensive scope of technical,
textual and social dimensions for technology teaching are explicated; the consideration that ‘technology as text’ to be interrogated, interpreted and constructed; creating textual bridges between the known and new social and technoliterate practices.

Results propose that technology and pedagogy practices are mutually constitutive: that is, that technology use takes place within the pedagogical architectures of the classroom space, both mutually shaping and being shaped by the other, each accomplishing different kinds of outcomes through the interactions encountered in these spaces. This proposition pays attention to the multiplicity of ways learners visibly and explicitly connect to new ways of interacting and communicating; it lays the foundation for a futures focused pedagogy critical for equipping teachers with the power to view technologies as pedagogical process rather than a device to be used in one-shot exercises.

CONCLUSION
This paper reframes ICT as Interactive Creative Technologies, a position which reflects an approach to technology use in classrooms that is essentially about pedagogy. It takes the focus from the resource per se to process. And so it is argued that in order to transform pedagogical action in 21st Century classrooms beyond a resource centred, activity-driven approach, the pedagogy of technology needs to be reconceptualised as being about interactivity and creativity. To authentically integrate technology is not a matter of simply using the technology; it requires the enactment of a pedagogy which enables students to participate in interactive processes which keep in mind the importance of social and cultural competencies motivating students to engage in contemporary learning.

Change, due to technological impacts, is an enduring reality of classroom life. And in the face of the pedagogy of technology becoming rigid, highly structured and routinised, teachers need to be zealous in generating a creative learning culture where classroom activity and interactivity are fundamental dimensions of technology use. Such an approach to pedagogy enlivens and invigorates the learning and learning spaces for both teacher and students. The findings suggest schools should harness both the desire for utilising technology to liberate classroom creativity as a valid pedagogical outcome to equip students for a future of creative possibility. And viewing ICT as Interactive Creative Technologies offers a new understanding of pedagogical practices and discourses within a multimodal technological culture.

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