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Creating Flickr Photo-Narratives with First-Year Teacher Education Students: The Possibilities and Pitfalls of Designing Emergent Learning Tasks

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Abstract: *This paper explores the implementation of a Flickr (Web 2.0 photo sharing software) learning task in a first year primary education course. The context for the task was a Multiliteracies course where students designed digital media activities for later use with primary age students. The Flickr task was constructed to determine how a learning activity might be designed to afford the best opportunities for emergent learning (Kawka, Larkin & Danaher, 2011). The paper analyses data collected in phase one of an emergent learning project (Semester Two, 2011), discusses the outcomes of the learning task and questions whether the opportunities provided for interaction and communication between students resulted in emergent learning. Initial data suggests that, although the Flickr environment affords opportunities for emergent learning, for this group of students within the confines of the particular task and learning environment, evidence of emergent learning was minimal. This has ongoing implications for designing teacher education courses that incorporate blended learning pedagogies.*

Introduction

The benefits and opportunities of Web 2.0 technologies to facilitate student learning lie in the capacity of those technologies to support engagement and to allow learners to "create, manipulate, and share content" (Rutherford, 2010, p. 1). For the purposes of this paper, "Web 2.0 technologies" is used as a term to describe web-based applications (e.g., blogs, social networking and bookmarking, wikis and podcasts) (Kennedy, Dalgarno, Bennett, Gray, Waycott, Judd, et al., 2009). The recent expansion of these technologies necessitates an investigation into how educators can best design and facilitate learning for, and within, these new technological contexts.

Whilst the availability of interaction and communication technologies is increasing, it often appears the case that teaching practices remain static and fail to engage fully with the interactive potential of these technologies. These interactive affordances suggest that the chosen pedagogical approach be less "teacher led" and more "co-constructed" with the learners generating a pedagogical space "in which actor and system co-evolve" (Williams, Karousou, & Mackness, 2011. p. 40). Furthermore, Williams et al. (2011) suggest "emergent learning" as an alternative framework for interaction to engage learners. Emergent learning is

> learning which arises out of the interaction between a number of people and resources, in which the learners organise and determine both the process and to some extent the learning destinations, both of which are unpredictable. The interaction is in many senses self-organised, but it nevertheless requires some constraint and structure. It may include virtual or physical networks, or both. (Williams et al., 2011, p. 41)

In developing the notion of emergent learning, Williams et al. (2011) contrast it to "prescriptive learning", where knowledge is: predetermined for the learners; non-negotiable; and hierarchical in structure. By contrast, in emergent learning, knowledge is: open; largely created and distributed by learners themselves; and collaborative and self-organised. Williams et al. (2011), in examining the conditions that would encourage emergent learning to occur, suggest that Web 2.0 structures provide the conditions appropriate to facilitate emergent learning; however, merely having conditions conducive to emergent learning does not ensure that emergent learning will occur.

Emergent learning can be further contextualised within the existing learning paradigm of connectivism. Connectivist learning encourages learners to build and sustain networks in which they create and develop knowledge to

be shared with others (see Siemens, 2004). In the construction of these networks, an "emergent collective" arises from people's contributions (Anderson & Dron, 2011). This collective network "is a socially constituted entity that is…a reflection of the group mind that influences but does not engage in dialogue" (Anderson & Dron, 2011, p. 88). A significant pedagogical factor underpinning connectivism is that the teacher is not solely responsible for delivering content; rather teachers and learners jointly create content which then leads to the future creation and distribution of further content (Anderson & Dron, 2011).

The confluence of emergent learning and connectivism suggests that in online spaces the nature of knowledge is transformed from prescribed and individual to open and collective. In this transformational space, knowledge changes from being "given authority through the curriculum" to knowledge emerging "through negotiation and a process of coming to mutual agreement" (Sharples, Taylor, & Vavoula, 2007, p. 242). The situation noted above appears to indicate an implicit uncertainty in pedagogical contexts which distribute the authority for knowledge construction to the learners. What sort of structure does this suggest for students' learning and instructors' teaching? How is this knowledge construction played out in higher education contexts? Questions similar to these are identified by Anderson and Dron (2011), who argue that connectivist models are primarily "theories of knowledge" which make them difficult to transpose into practical teaching activities. In this paper we explore how we used Flickr (Web 2.0 photo sharing software) as a tool to encourage student collaboration in the creation of content in a first year, pre-service education course. A key aim was to investigate the potential of Web 2.0 technologies in supporting social interaction, connectivity and collaboration among the student cohort (See Conole & Culver, 2009).

The paper consists of four sections:

- The emergent learning framework
- Transactional Distance Theory
- The Flickr learning task
- Discussion of the course vis-à-vis the framework and the theory.

Emergent Learning Framework

In the planning for the delivery of the Multiliteracies in Education course in question, an opportunity presented itself to design and investigate a learning task that engaged with the notions of emergent learning discussed

above. In addition to providing an alternative route to knowledge construction for the students, it was also a way for the authors to understand how the application of these theories might unfold within a practical teaching context. The course primarily involves students critically analysing children's popular culture texts and then reflecting their burgeoning understanding in the creation of their own multimodal texts. As part of the course learning activities, students created multimodal texts (e.g., Interactive PowerPoint; Prezi presentation; Glogster pages) as a means to "demonstrate their understanding of multimodal texts and provide evidence of their ability to create meaning from and with multimodal texts, as well as their ability to recognise, evaluate, and value effective multiliterate practices in themselves and children" (Assessment Summary, 2011). Students were required to create 10 different multimodal texts (aimed for a primary age student audience) which were to be presented via a personal wiki. Three of the 10 texts required the use of Flickr and it is the Flickr component which we explore as an "emergent learning" task.

Following on from Williams et al. (2011), we assert that, for a learning event within a Web 2.0 environment to be considered emergent, there needs to be not only an effective balance between teacher-directed content and student-directed content for knowledge to be open, creative and distributed by learners; but also a number of opportunities for interaction and communication between students within the system, given that these opportunities "drive the emergence of structures that are more complex than the mere parts of that system" (Sommerer & Mignonneau, 2002, p. 161).

In an earlier paper (Kawka, Larkin, & Danaher, 2011), we proposed the design and creation of a pedagogical space in order to theorise how a learning task might be constructed to afford the best opportunities for emergent learning. Consequently, we developed a matrix which incorporated four parameters: teacher-directed content; student-directed content; interactive learning; and non-interactive learning. The four elements of the matrix are briefly outlined below.

Teacher directed content. This dimension indicates that the teacher is responsible for all of the content the students need to engage with. The teacher establishes the processes of interaction and specifies the knowledge to be learnt. In this instance, the knowledge and understanding relate to Media Arts content in a multiliteracies framework.

*Student directed content***.** In this dimension it is assumed that knowledge is created and distributed by the learners. The students drive the content creation and specify what knowledge is of worth in their learning.

Interactive learning framework. This dimension suggests the creation of a collaborative, student created media text. Students are provided with

multiple opportunities for interaction where they can experience the sense of working together on the same goal. This dimension is similar to the notion of "emergent structure" in distance education environments. Such an emergent structure "can simultaneously manifest structure and dialogue" (Albion, 2008, para. 9). In other words, an environment can be highly structured yet open to opportunities for student dialogue and authorship of course content (McLoughlin, 1998). We return to this important notion later in this paper.

Non-interactive learning task. In this dimension, students do not have a shared sense of creation and have limited opportunity for continual interaction. They may see one another's work but they cannot interact with one another over time or in a substantive way.

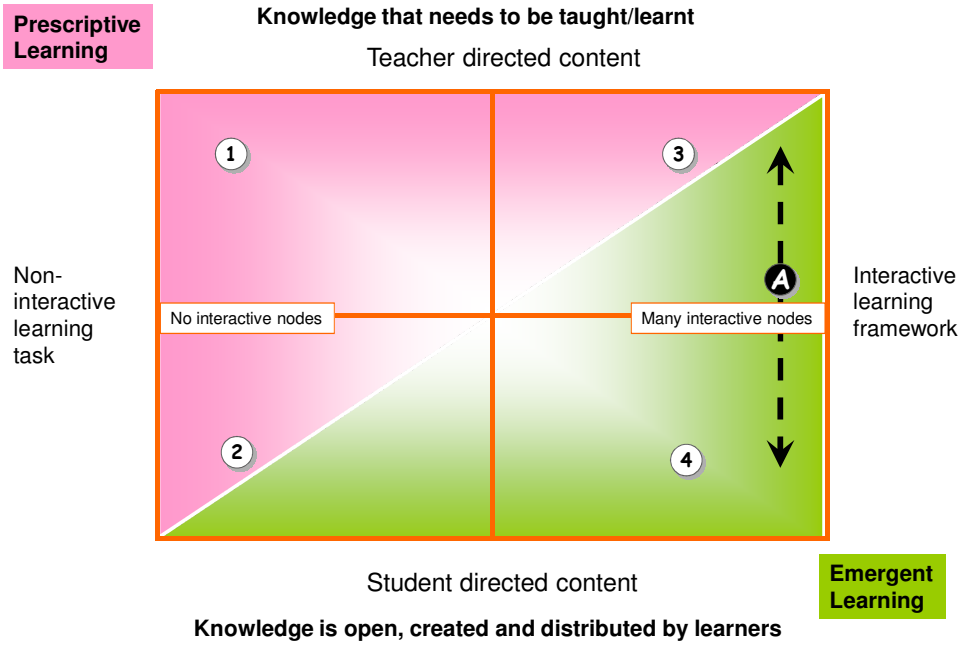


Figure 1: Emergent Learning Environment matrix (Kawka, Larkin, & Danaher, 2011)

When these four dimensions are plotted on a two-by-two matrix, four quadrants are generated, each representing a different activity type (Figure 1).

Quadrant One (teacher directed content/non-interactive learning task). The teacher provides very structured content to be learnt. The task is not interactive, as students cannot engage with one another in this task. For

example, students follow instructions to take a particular kind of photograph and upload the photograph to their individual wiki.

Quadrant Two (student directed content/non-interactive learning task). Students create the task content themselves; however, they do not engage with one another. For example, students decide what type of image they want to create to upload to their wiki. This quadrant is problematic as the quality of learning is minimal for novice groups.

Quadrant Three (teacher directed content/interactive learning framework). The teacher drives the content and processes of learning. Students interact with one another, but in a very structured, teacher directed way. For example, after uploading their photograph to their wiki, students are instructed to add a question about another student's work and then respond to this question. The problem here is that, because the teacher has highly controlled the format of, and the scope for, student interaction, the level of complexity that can emerge from the interaction is minimised.

Quadrant Four (Student directed content/interactive learning framework). The task completed here is characterised by the sharing processes implicit in social networking. Students have multiple opportunities to interact with one another and the content is formed in the multiple interactions. For example, after uploading an image to their wiki, students comment on one another's works, and based on the comments create new images and commentary. A potential issue here is that, because there is limited mediation by the teacher, the learning may be of limited quality or benefit.

In examining the learning implications of each quadrant, "Point A" in our matrix exhibits the characteristics most likely to be conducive to emergent learning by novice groups. This point lies along a line segment which indicates learning contexts characterised by teacher and student directed content/interactive learning framework (multiple interactive nodes). Here the learning task is primarily influenced by slightly increased teacher facilitation. The teacher directs the interaction as students collaboratively engage with one another and the resultant structure is predicted to be complex, unexpected and emergent. Our initial theorisation of emergent learning (Kawka, Larkin, & Danaher, 2011) concerned the creation of an emergent learning matrix for the purpose of application in Semester Two, 2011. In order for our matrix to be more broadly applicable to online educational contexts beyond "The Arts" we have incorporated key elements of Transactional Distance Theory (Moore, 1993) – namely, Structure, Dialogue and Learner Autonomy. We suggest that these elements, from the domain of Distance Education, can be utilised to understand emergent learning environments and to alert online educators to the need for high structure and high dialogue in such emergent spaces. As further data are collected we will be able to articulate, more definitively, teaching strategies for encouraging learning in online spaces.

Transactional Distance Theory

Although Moore (1993) outlined the theory of transactional distance in the broader context of distance education, it is equally applicable to online and blended learning contexts. In defining a theory for distance education, Moore suggested that transactional distance is not defined in terms of geographical distance, but rather it is a pedagogical concept encompassing the separation of learners and teachers by time and space. Thus, transactional distance, which is the "psychological and communications space" (p. 22) that occurs between learners and teachers, is shaped by the environment, the individuals in the environment and their patterns of behaviour. Moore further notes that transactional distance exists in face-to-face teaching contexts, but that the separation between learners and teachers is greater in distance education (and we argue online education as well), thus necessitating different pedagogical approaches.

Moore (1993) identifies three elementary constructs within the relationship between teacher and learner. These constructs, or "clusters of variables", are Dialogue, Structure and Learner Autonomy (p. 23) and it is the interaction of these variables that largely determines the extent of the transactional distance. A brief discussion of each variable is provided below.

Dialogue is the interaction between the teacher and the learner. It occurs when the teacher gives instructions and the learner responds. Dialogue is very similar to interaction; however, dialogue describes positive interactions. A characteristic of positive interactions is that the "dialogue is purposeful, constructive and valued by each party" (Moore, 1993, p. 24). The communication medium is an important factor in determining the type of dialogue in any interaction as "by manipulating the communications media, it is possible to increase dialogue between learners and their teachers, and thus reduce the transactional distance" (p. 25).

Structure is a component of the overall course design. "Structure expresses the rigidity or flexibility of the programme's educational objectives, teaching strategies, and evaluation methods. It describes the extent to which an education programme can accommodate or be responsive to each learner's individual needs" (Moore, 1993, p. 26). If the course is tightly structured, but does not facilitate dialogue between teacher and learner, then the transactional distance is high. By contrast, if the level of dialogue between teacher and learner is high, and the course is loosely structured, the transactional distance is likely to be low.

The third variable of transactional distance is *learner autonomy.* Learner autonomy refers to the degree to which "it is the learner rather than the teacher who determines the goals, the learning experiences and the evaluation decisions of the learning programme" (Moore, 1993, p. 31). Levels of interaction are therefore dependent on the types of learner, for example, some learners may need high structure to succeed, whereas learners with greater autonomy may prefer less structure. Courses that are highly structured; therefore, provide significant guidance and direction for learners, but consequently do not afford much learner and teacher interaction. In circumstances such as these, learners need to exert a high degree of autonomy to make sense of the content. Thus, there is a "relationship between dialogue, structure and learner autonomy, for the greater the structure and the lower the dialogue in a programme, the more autonomy the learner has to exercise" (p. 27).

Benson and Samarawickrema (2009) extend Moore's (1993) initial theory and apply it to e-learning course design. They explore the relationship between structure, dialogue and learner autonomy and focus on designing learning contexts to mitigate transactional distance and thus support learners in specific contexts. For example, they suggest that in contexts that are likely to have low transactional distance, learners can be appropriately supported by low dialogue and less structure (e.g., the coursework components of Masters or Doctoral degrees). In a different learning context that is likely to have high transactional distance (e.g., a first year, undergraduate, online course), high levels of dialogue and high structure are beneficial. In the previous examples, Benson and Samarawickrema (2009) suggest that individual learner autonomy is not a significant consideration in either course design. This is the case because the design of the course already presupposes high or low levels of student autonomy at a cohort level. However, learner autonomy comes into play in learning environments that are likely to have medium transactional distance. In such an instance, it might be the case that lower structure and higher dialogue requires a high level of student autonomy for success (e.g., in a fourth year professional experience course).

Our concern here lies with an investigation into the intersection of TDT and online technologies as the possibilities for dialogue, structure and learner autonomy within Web 2.0 environments create important implications for transactional distance theory. Benson and Samarawickrema (2009) recognise the influence of Web 2.0 technologies and indicate that it is important to separate the affordances of this communication medium from the structure and dialogue managed by the teacher. They also highlight that Web 2.0 communication media can result in high transactional distance because of the complexity of managing the medium for the students and thus learner autonomy is an additional concern in course design.

In Moore's (1993) initial conception of transactional distance, high structure suggests rigidity of content and lack of responsiveness to students' needs; and low structure suggests a high level of flexibility in responding to students' needs. "Structure" is conceptualised as the creation of one way communication channels from the teacher to the students. Thus, the level of "dialogue" is directly related to structure in that increased structure equates to less dialogue and high transactional distance and vice versa. Benson and Samarawickrema's (2009) model, however, conceptualises transactional distance as not an either/or proposition in terms of Structure/Dialogue but rather as a four dimensional matrix of High Structure/High Dialogue, Low Structure/High Dialogue, High Structure/Low Dialogue and Low Structure/Low Dialogue, where the level of student autonomy is the independent variable. Such a matrix may be more attuned to the realities of Web 2.0 enabled online spaces where students can exhibit higher levels of control over Dialogue and also, in some instances, course Structure.

When TDT is compared to our *Emergent Learning Environment* matrix, the "structure" element of course design is comparable to the "teacher directed content/student directed content" dimension. Our content design continuum is conceptualised in terms of content creation and distribution, from the direction of either the teacher or the learner, or as a shared responsibility for content creation. In our conceptualisation, learner autonomy is thus subsumed under the "student-directed" component, rather than being an independent variable in relation to the "teaching behaviour variables" of dialogue and structure (Moore & Kearsley, 2011). "Dialogue" parallels our "non-interactive learning task/interactive learning framework", whereby, in "high dialogue" situations, interaction is purposeful, valued, and constructive and supports collaboration, whereas "low dialogue" situations depict contexts where students are unable or unwilling to interact with one another.

Our investigation focused on determining the conditions that were likely to be the most conducive for emergent learning to occur in novice groups. This is a desirable quality for online learning environments and is an alternative to prescriptive learning which cannot fully accommodate the nature of new social technologies (Williams et al., 2011). TDT is a useful aid to facilitate a deeper understanding of our matrix when considering the relationship between learners and teachers in emergent learning. In addition to tracking student collaboration in emergent environments, this article also addresses the following questions:

- Does high structure equate to "prescriptive learning" and low structure to "emergent learning"?
- Where does emergence occur in the transactional distance matrix?
- What is the practical potential of the emergent learning framework for the design of blended learning tasks?

We proposed, in Kawka, Larkin, and Danaher (2011), that the ideal space for emergent learning in novice groups lies just above the midpoint of teacher/student directed content (where content is co-constructed by learners and teachers). Here we add to this initial suggestion the proposition that for more autonomous students the ideal space would be just below the midpoint. In both cases, the content distribution and creation are situated within the "interactive learning framework" parameter. This is the "emergent collective" (Anderson & Dron, 2011) or the "emergent structure" (Albion, 2008) that affords multiple interaction, and co-creation which can be re-used for future applications. In our model, this emergent space is depicted by the line segment which includes Point "A". In TDT terminology, this space suggests both high dialogue and high structure, which, according to Benson and Samarawickrema (2009), would result in a low transactional distance environment where the learner autonomy variable is of less importance. This of course contradicts the initial interpretation of Moore (1993), as well as the later interpretation of Gakool-Ramdoo (2008), who notes that:

> the more structured an educational program the lesser space is provided for dialog or interaction and negotiations of meaning during the teaching/learning process, and the greater the distance between the teacher and learner. The greater the transactional distance, which is viewed as a space for potential misunderstanding, the more responsibility is required of the student. (p. 7)

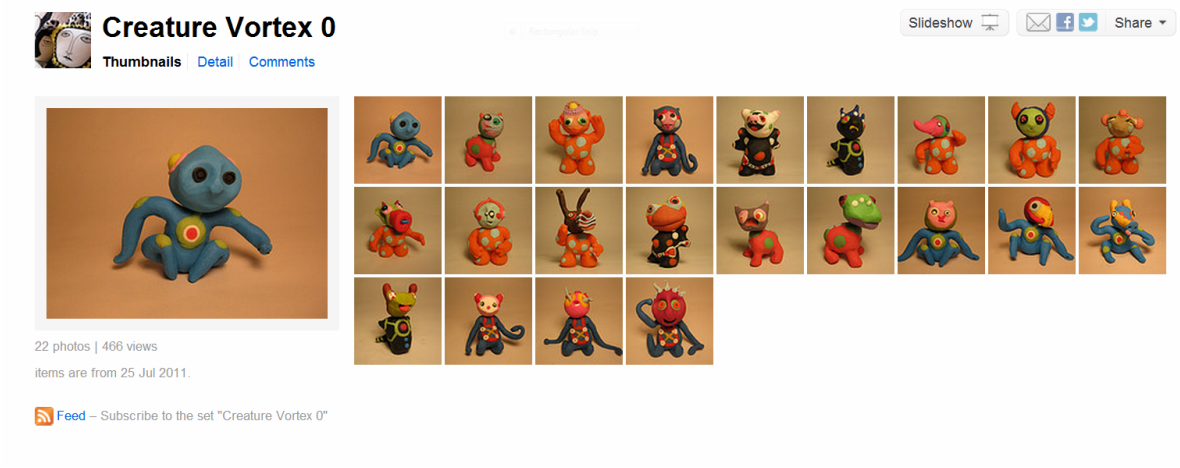
The remaining section of this paper explains in greater detail the nature of the particular Flickr task and seeks to determine whether Emergent Learning and TDT are compatible theories and whether high structure and high dialogue can co-exist to create conditions favourable to student learning.

The Flickr Learning Task

We trialled the Flickr learning task in Semester 2, 2011 with the task implemented as part of the required activities in the course. The course has been conducted since 2005 and Marta has designed the activities from the onset. The activities have evolved over time to better cater for students' needs based on observed student engagement and confirmed by student feedback (see Kawka & Larkin, 2011). Student engagement is a significant factor in designing instruction in our university context. A positive student experience in first year is imperative for both student success and student retention.

“Students who are engaged early in first year, and who learn how to succeed early in their university careers, are more likely to stay the course than those whose experience is not so positive” (Griffith University, 2007, p.1) Student engagement is evaluated as part of the quality standards audit of the university. However, judgments about engagement were also made during interaction with the students. This engagement is observed as student time on task; visible enthusiasm for the task; animated discussion; and direct student comments throughout the class such as “this is so fun” and “I love doing this”. The Flickr task discussed in this article emerged within the context of designing a practical activity to demonstrate how an emergent learning framework would look in practice. As indicated earlier, this was the subject of the more theoretical 2011 article. The primary goal of this research was to provide a practical context for the emergent learning framework and to determine the relationship between the teacher, learner and the blended learning context (the research questions indicated earlier) and to establish and implement a practical example of the model in action. We used the particular Flickr task as we identified that it would be conducive to emergent learning (large open structure, multiple interactions of the user at different points in the interaction). The specified quadrants of the framework were identified through a “grounded approach” and were uncovered in situ as the task progressed. As Marta was also the classroom tutor, observations were being made directly as the classes progressed. Nodes were identified and followed during class time with the students and tutor as part of the class activities.

160 students were involved in the course across two campuses. The course involved students rotating through two workshop spaces, a computer lab and a studio, spending five weeks in each location. Marta taught all of the computer lab classes. Students had an activity to complete in the lab each week and, upon completion, were required to upload their completed multimodal text to their individual wiki page (housed on the university Blackboard learning management system). Resources that assisted students in the completion of the tasks were provided via Blackboard. The first Flickr activity involved students selecting an image of a plasticine creature and subsequently creating a narrative concerning this creature. Students had two Flickr sets to choose from: One Flickr set (Picture 1 - *Creature Vortex 0*) contained images of the plasticine creatures created by Marta, and the other set (Picture 2 - *Creature Vortex 1*) contained images of the plasticine creatures created by students in a previous studio activity.

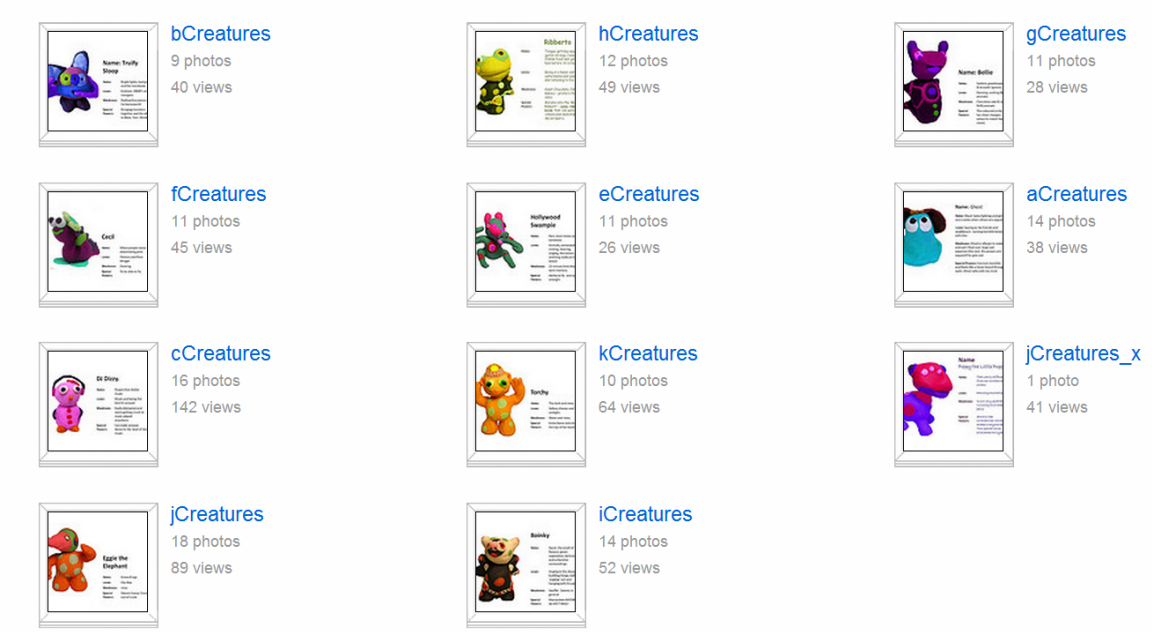


Picture 1: Creature Vortex 0

Picture 2: Creature Vortex 1

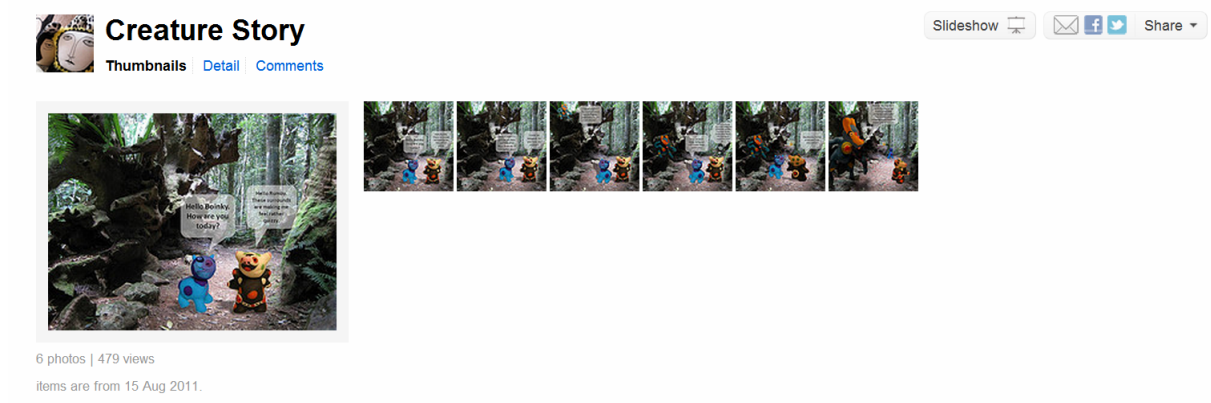
After selecting a creature image, students were provided with a PowerPoint template and were required to insert the image and invent a name and some personality characteristics for their creature. In this activity, students were involved in investigating popular children's character websites (e.g., List of Pokémon by type, 2012) and used descriptions of these characters as a stimulus for their own creature descriptions. Once students completed their PowerPoint slide, they saved the slide as an image, and then uploaded it to their Flickr account (created during the computer lab session). At the end of the first session, students copied the URL link to their Flickr image and pasted this link into their wiki page. Before the next computer lab session, Marta created Flickr galleries for each class in her own Flickr site. Students' creature images, available from their individual wiki pages, were added to each gallery

and at this point the initial network was created (the “initial letter” prefix in the filenames below indicate individual class galleries).



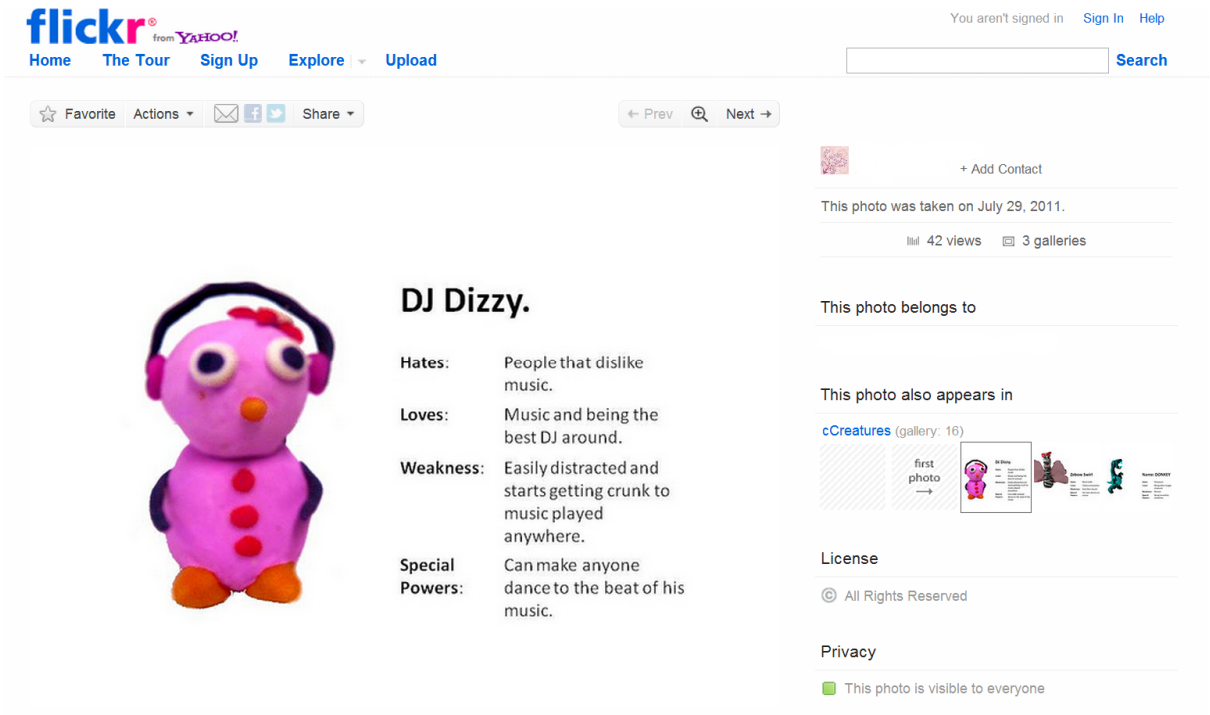
Picture 3: Marta’s class Flickr Galleries

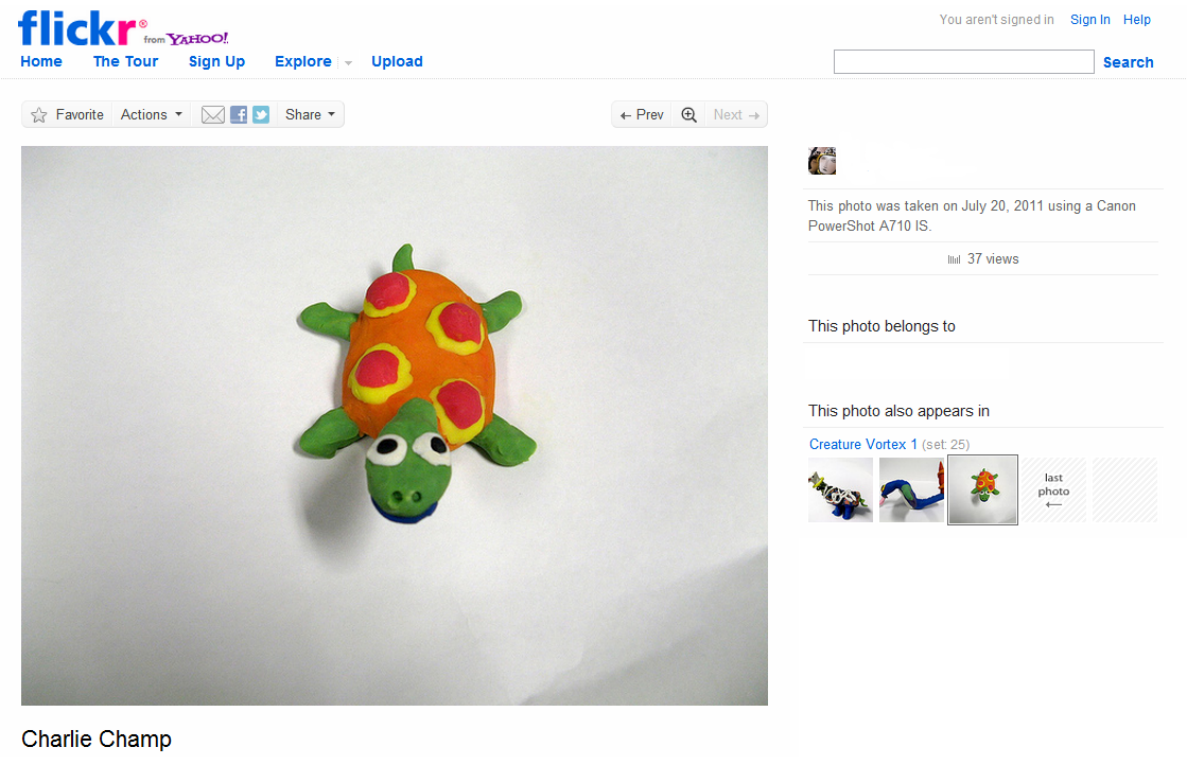
The second computer lab activity required students to work either with a partner or in a group of three. The group had to create a “Creature Story”, using their two (or three) characters, which incorporated the personality characteristics of their creatures. They completed a 6-9 slide PowerPoint template (using resources available on Blackboard) to construct their story and, once this was complete, saved the slides as a sequence of images. These images were then uploaded to their Flickr site and added to a Flickr “set”.



Picture 4: Marta's "Creature Story" Flickr set

A further requirement of the second computer lab activity was the incorporation of an additional character into their story. This character was to be selected from any of the class Flickr galleries. Once an additional character was selected, the initial creator of the character was automatically alerted (via Flickr mail) that their character was now in another student's gallery. The student could then follow a link to this new gallery and subsequently read the story incorporating their character. Via this process of character selection, it became evident that some characters were more popular than others (this skewed selection becomes important for our notion of emergence). For example, one character (*DJ Dizzy*) was viewed 40 times (the average view per character was 15), and was featured in 3 galleries (resulting in 3 different stories). In another example, *Charlie Champ* was selected 5 times for characterisation from *Creature Vortex 1* (the majority of characters were used only once or not at all in the stories of others).





Charlie Champ

Picture 5: "DJ Dizzy" and "Charlie Champ" student creations.

Discussion

Before we commence the discussion it is important to establish our interpretation of the terms, high dialogue, low autonomy, high structure and creative engagement. High dialogue occurs when students regularly interact with each other in an authentic way. This was facilitated in this instance as the task was a core component of the course. We designed for high student dialogue rather than hoping that it would emerge from the students as they engaged with the task. Low autonomy is evident in students who require high degrees of scaffolding (high structure). The cohort of students under investigation are recognised as having low autonomy because they are first year students.

This observation is confirmed in the literature with first year students characterised as being uncertain of their role as students, less diligent with their study habits, less academically oriented, less motivated and less engaged with their study (James, Krause & Jennings, 2010). Wilson and Lizzio (2008) further suggest that

> First year students often do not possess sufficient self-regulation and problem-solving capacities to adequately prepare for, or process … potentially challenging [academic] experiences, with implications for their subsequent academic engagement, learning outcomes and persistence. For example, recent research points to a lack of fit or incongruence between staff and commencing students' (mis)-conceptions (e.g., What's involved? How best to prepare?) and expectations (e.g., What investment is required? What help is available?) of assessment tasks (Collier & Morgan, 2008). (Wilson & Lizzio, 2008, p.1).

As a consequence of information from the literature, and our own student evaluations and observational data of similar students for the past five years, we deliberately catered for low autonomy in the specific design of the course. Although creative engagement is not a component of the model (i.e. we are not observing levels of creativity), the task itself is creative: students make artworks and create fantasy characters and this creative engagement is a consequence of the high structure and high dialogue which are planned components of the course design.

The purpose of the Flickr task outlined above was to investigate how a learning task for emergent learning can be created (in this instance by a teacher). One intention of emergent learning is the creation of a learning environment that will increase in complexity as students interact with it. From a TDT perspective, the Flickr learning task was highly structured as students were to complete set steps at particular times using specific templates in the completion of the task. Dialogue was high as students worked with one another on the task; used one another's content; and had high flexibility in the creation of the story that would emerge. In terms of learner autonomy, this was a novice group of students who were more likely to succeed in a highly structured course with precise learning and assignment goals. As acknowledged by Selwyn (2007), contemporary university students are strategic in their approach to course engagement at university. They "engage with their studies in ruthlessly pragmatic, strategic, and tactical ways" (Selwyn, 2007, p. 88) and, based on our previous university teaching experience, will generally not engage or contribute additional content that is not an assessable requirement of the course. This strategic use of student time is a prohibitive factor for emergent learning in university contexts. As novices, this cohort is characterised by low autonomy; however, the task does not exclude more autonomous learners from extending the boundaries of the activity. As the basis of the task is creative engagement, there is considerable potential to accommodate various levels of autonomy.

In terms of emergent learning (a result that is complex, unexpected and emergent), the students created their own content which was shared and re-used; the content was co-constructed with the teacher and fellow students; and the resulting "emergent collective" was substantial and complex. Patterns started to emerge in the sense that some creatures became more popular than others; however, it is difficult to ascertain the extent of this without examining all the individual contributions (it is challenging to visualise all the connections made as Flickr does not have this capacity for node mapping). The relationships between how many times a creature has been placed in a gallery and the number of stories including that particular creature may also not be accurate as some students forgot to add the additional character to their gallery. An individual student can, however, follow the pathway of links that connect all the 160 individuals in the course. For example, clicking on a specific creature takes you to the gallery where the creature was featured, which connects to the story of the creature, which takes you to another creature from the story, which connects to another story *ad infinitum*. Consequently the Flickr environment is large and can grow indefinitely.

Despite this potential for growth and complexity, the outcomes were largely predictable and we initially anticipated that some characters would become more popular than others (Kawka, Larkin, & Danaher, 2011), and that the student focus would tend more to specificity than to complexity. This

specificity was always likely, owing to the structure we deliberately embedded in the task. However, without the structure the likely success of the task would be negligible because, owing to the reluctance of students to create work beyond the bounds of assessment mentioned earlier, their level of contribution would not be great and the quality of the resultant products would be likely to be low. In addition, the structure of Flickr also may not be conducive to any greater level of emergence than what was demonstrated. Students could have potentially tagged their images; provided search terms making their images available via Flickr searches; or added external Flickr images to their own galleries which would then inherently make our classroom transcend physical boundaries. However; we don't believe that this would have made the task more conducive to learning as the primary purpose of the task was to collaborate and share creature creations in the course, and was not focused on learning about the nature of Flickr. Theoretically, extending the reach of the creatures in the online world may afford emergence (unexpected connections from individuals from the "outside" world), but we doubt that this would happen throughout the duration of the course. On the other hand, extending the reach of the creatures in a structured context (e.g., linking the pre-service teachers' creature creation to a task in a primary classroom) would be of very high educational benefit.

Aside from the reservations noted above, we were pleased with the student outcomes from the task, as it was highly engaging for the students and also effectively connected their learning to the key concepts explored in the course. It was also a very rewarding experience for Marta in terms of the processes of joint creativity. Flickr was an efficient and effective "social" medium for sharing images and for the joint construction of stories. It was beneficial for the students as they created a digital resource, suitable for later use with primary school students.

Conclusion

We designed the Flickr learning task so that it would allow for emergence to occur. Creating the *Emergent Learning Environment* matrix, and then deepening our understanding of the matrix in terms of TDT, greatly assisted us in designing the learning task. The parameters of the matrix (teacher-directed content/student-directed content; interactive learning/non-interactive learning) provided a framework that contributed to the creation of a successful task. In this particular instance, the task was supported by some face-to-face interaction, so it would be informative to investigate how interaction between students could occur if this activity were repeated in an

online only course. Many students required assistance from one another, or the tutor, in using various tools required for the task (e.g., Adobe Fireworks or PowerPoint). Students also felt comfortable with the task as Marta assisted them in the computer lab (e.g., uploading images to Flickr; creating Flickr sets; adding images to a gallery). Although it would be possible to duplicate this task in a solely online course (via specific, step by step instructions and short instructional movies), we suggest that this is not a real substitute for face-to-face assistance as these students greatly benefited from a guided-tour through the procedures.

We anticipate, based on our experience with first year students, that, if they were required to complete this task outside the computer lab time, they would not find it as enjoyable because of the additional responsibility of self-learning the technology skills required to complete the task. This observation supports the current debate in the literature (see Kennedy, Judd, Delgarno, & Waycott, 2010; Selwyn, 2007) challenging the contemporary construct of the "digital native" (Prensky, 2001; Tapscott, 1998) which suggests a generation of university students highly adept with information and communication technologies. Our students, like those in the studies conducted by Selwyn (2007) and Kennedy et al. (2009), "appear to favour conventional, passive and linear forms of learning and teaching" (Margaryan, Littlejohn, & Vojt, 2011, p. 439). Based on an informal survey conducted during the computer lab time, it was noted that there were only three students out of 160 who previously knew about Flickr. Even though the majority of the students were highly familiar with Facebook, they still required specific guided instruction in using an intuitive, web based, social networking software such as Flickr. We will continue with this task in Semester 2, 2012 and the emergent Flickr environment will continue to grow as students contribute their own content, and also utilise the large pool of creatures already created. Our further research will concentrate on the nature of this task in terms of the relationship between teacher and learners in terms of creative output. Additionally, we will continue to develop the conceptual nexus among Emergent Learning, Connectivism, and TDT, specifically in terms of creativity in blended and online learning contexts.

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