CAN A MEDIA ANNOTATION TOOL ENHANCE ONLINE ENGAGEMENT WITH LEARNING?

A multi-case work-in-progress report

Meg Colasante[1] and Josephine Lang[2]
[1]*College of Science, Engineering and Health, RMIT University, La Trobe Street, Melbourne, Australia*
[2]*School of Education, RMIT University, La Trobe Street, Melbourne, Australia*
meg.colasante@rmit.edu.au, josephine.lang@rmit.edu.au

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Abstract: The paper explores preliminary data of four cases in a larger study investigating the effects on learning of a new educational technology called Media Annotation Tool (*MAT*). In particular, the paper focuses on learning engagement with *MAT* and begins to raise questions about what factors promote or enhance engagement. Drawing on the work of Kirkwood (2009), the authors analyse the type of educational technology functions that were expressed through the ways teachers integrated the use of *MAT* into their curriculum. Another factor explored in the paper is student engagement. Barkley's (2010) theorising on the complexity of student engagement for learning argues that engagement is where motivation and active learning synergistically interact. Examining students' reflections on their use of *MAT*, the authors identify that while *MAT* offers active learning, motivation for the use of *MAT* may be a missing factor for some disengaged students. This insight provides further themes to explore in further analysis of the project's data.

1 INTRODUCTION

Advances in educational technology offer diverse benefits for tertiary education students, such as flexible anywhere-anytime learning. However, it is not responsible to claim that any new educational technology development is capable of learner benefits without research and evaluation, and such research and evaluation should include how the tool is actually (and specifically) used to achieve learning by the teachers and students. There are growing calls for research studies that are based on inquiries that reflect the complexity and "the more transformational effects of e-learning, such as creating a distributed community, and learning new genres of communication and collaborative work practice" (Andrews & Haythornthwaite 2007, p. 2).

This paper discusses a new educational technology, 'Media Annotation Tool' (*MAT*), and the current research project that is examining the tool as integrated into several tertiary education courses (subjects) spanning a range of disciplines. The various classes formed cases in the multiple-case study, including four undergraduate, one postgraduate, and four vocational (TAFE/college) classes. While extensive data (surveys, interviews and learning artefacts) have been collected and data analysis is well underway, this paper will focus on the early findings from data across the four undergraduate cases; that of chiropractic, medical radiation, and two primary education classes: visual arts and literacy.

Discussion on this particular data focuses on learning engagement with *MAT* and begins to raise questions about what factors promote or enhance engagement with activities using the tool. This is in acknowledgement that technology does not singularly—in isolation of other factors—enhance engagement for learning and/or improve learning outcomes (Kirkwood 2009). Student engagement for learning is complex involving a "synergistic interaction between motivation and active learning" (Barkley 2010, p. 8).

Kirkwood (2009) recognises that ICT has been adopted in higher education to enable functions such as: presentation on demand; interaction and engagement with resources; dialogue between learner-teacher and learner-learner; and generative activity by students to use as evidence of learning.

Kirkwood adds "There is the potential for ICT to *extend* or even *transform* what can be realised in HE teaching (Kirkwood 2009, p. 108, his emphasis)". Significantly for the scrutiny of this project, he highlights a disconnect in educational technology between potential and actual learning benefits, including engagement, and how "teachers and learners don't always get what they hope for" (Kirkwood, 2009, p.109).

This paper is a preliminary look at the four undergraduate cases for differentiation in indicators of learning engagement with *MAT*, and seeks out variables to offer points for further examination of the project's data.

2 WHAT IS 'MAT'?

MAT is a media annotation tool designed to allow students to engage actively with learning artefacts represented in various media forms. Although being trialled by a number of programs, the tool is still in its first stage of development. The trial is allowing to refine the use of video media in *MAT* for learning and teaching; yet design work has occurred to enable use of other media forms (audio, digital images and text: Stage II; inverting work in *MAT* into a media-rich report: Stage III).

What differentiates *MAT* from uploading a video into other technology used in education, such as a wiki, blog, *YouTube*, discussion board, etc., is that instead of general comments in a single, linear listing, or perhaps branching off in various unstructured directions, *MAT* allows for notes or conversations to be attached directly to various selected pieces of artefact (media) under discussion in a structured manner.

As presentational technology, *MAT* could be dismissed as not capable of transforming learning experiences compared to technology with primarily communicative roles, such as idea sharing and co-construction of knowledge (Lai, 2011). However, *MAT* brings these cognitive and socio-constructive processes together within one tool, giving students opportunities to actively engage, discuss, and make personal meaning of presentation material.

MAT helps to fill the gap that can be drawn from the Sloan Consortium synthesis of research on the effectiveness of online learning environments, which draws upon the Community of Enquiry Model of Rourke, Anderson, Garrison & Archer (2001; cited in Swan 2004). Here it is inferred that online interaction with content encourages more divergence in thinking and discussion than face-to-face, while face-to-face learning is better at convergent study, such as often associated with directed inquiry and scientific inquiry. Other authors have noted this gap in support for electronic converging dialogue with their own goals to address it (for example, Lid & Suthers, 2003; Jung et al., 2006).

Therefore, while the previously mentioned tools are quite good for divergent conversations, *MAT* is more useful where convergent conversations are required; keeping multiple discussions each focussed on finite issues under analysis. Additionally, the annotation panels provided in *MAT*—which can be employed if and as required for the learning activity—are designed to provide a range of options. If used in full, a complete cycle of learning can be achieved within *MAT* itself.

To help illustrate the tool further, Figure 1 shows a *MAT* test site, where the artefact for analysis is a neurophysiology procedural video. The video is playing at the segment marked by the highlighted (active) red marker in the middle of the video timeline. The colour of this marker under analysis indicates the 'Electrode Placement' category (Marker Types list at top right), and the marker has been individually labelled as 'Back of head' for ease of locating this marker later (framed in marker list on lower right, and in annotation panel). The annotation panel named 'Notes' has been expanded to allow the text entry aligned to that piece of marked video to be read. The rest of the panels are closed, but could be opened and read by clicking on their respective arrowheads.

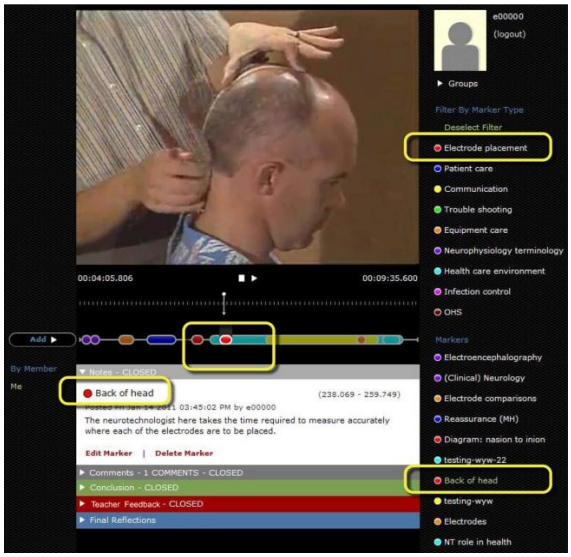

Figure 1: *MAT* test site: viewing the middle red marker on a neurophysiology video (yellow framing added).

3 RESEARCH PROJECT AND METHODOLOGY

Following indicators of effectiveness of *MAT* in a preceding pilot study (that is, integration of *MAT* in undergraduate Physical Education; see Colasante, 2011), funding was gained to test this new educational technology in a range of tertiary education cases. An internal institutional learning and teaching grant scheme funded the project. The study involved using *MAT* for professional learning based curriculum that focused on work integrated learning activities in a range of courses (subjects). The participant cases were classes of students and their teaching staff from across disciplines and sectors. Multiple cases (9) were involved from: chiropractic, medical radiation, and education (2) (undergraduate); law (postgraduate); property services (3) and audio-visual technology (vocational).

Initial findings from the four undergraduate cases will be referred to in this paper. While all the cases across the study harbour unique and varied characteristics, the four undergraduate cases hold some base similarities involving the traditional teaching format for delivery. They were each on-campus/face-to-face, undergraduate courses (subjects) as part of a full-time learning program, run on a traditional weekday lecture/tutorial/ classroom delivery over a semester.

3.1 Undergraduate Cases

The four undergraduate cases and their various learning purposes for *MAT* are provided below.

Education-literacy:

- Year 3, Semester 1, Primary Education multi-literacy class;
- Learning objective: Develop understanding and skills in using new media to critique writing and illustration;
- Use of video in *MAT*: students film and upload to *MAT* a draft storyboard of a children's book that was self-created to give and receive peer feedback as part of the learning process.

Education-visual arts:

- Year 2, Semester 1, Primary Education visual arts class;
- Learning objective: Explore visual arts teaching, including evaluating own processes and others;
- Use of video in *MAT*: students create videos to upload to *MAT* to (a) document and record their artistic processes and final art works during the semester; (b) record and discuss/reflect on experiences of gallery art spaces and art education practice in school settings.

Chiropractic:

- Year 2, Semester 2, Chiropractic clinical assessment class;
- Learning objective: Explore the various aspects of clinical encounters in the chiropractic field and engage clinical thinking;
- Use of video in *MAT*: students use professionally prepared video of a clinical scenario in two parts, uploaded by the teacher to *MAT*, to: 1(a) align patient's history to key categories; 1(b) discuss/reflect to short-list diagnoses; 2(a) align patient's examination to short-listed diagnoses; 2(b) discuss/reflect to determine diagnosis.

Medical radiations:

- Year 1, Semester 2, Medical Radiations radiographic imaging class;
- Learning objective: Develop image evaluation skills;
- Use of video in *MAT*: students use a professionally prepared series of videos of expert critiques of x-ray quality, simulating experiences of eventual clinical practice, uploaded by the teacher to *MAT*, to identify and discuss criteria for industry acceptability of: (a) several upper limb x-ray critiques; (b) several lower limb x-ray critiques.

3.2 Research Methodology

Multiple-case study methodology was used in this research project, which sought to understand whether *MAT* could improve engagement and learning experiences for students across different study disciplines. Students and teachers who used *MAT* in 2011 for workplace preparation themes were invited to participate in the study. The multiple-case study methodology follows a single, pilot case study of *MAT* integration in 2009 (Colasante, 2011), and reuses the pilot research design with minimal adaptation. As the cases were purposively selected—as in cases where the activity under investigation was occurring (Silverman 2005)—no deliberate literal replication was designed into the multiple-case study. However, it is anticipated there are

sufficient similarities and contrasts across the cases to anticipate some literal and/or theoretical replication (Yin, 2009) to emerge over the data analysis processes.

3.3 Data Collection

Mixed method data collection involved student surveys, individual observation and interview sessions for students and teachers, plus learning artefact analysis. For this early 'work-in-progress' paper, the data related to the student surveys, teacher interviews and artefact analysis across the four undergraduate cases are examined to establish whether students were engaged in their learning activities with *MAT*, and whether factors that might enhance engagement can be determined.

Students who chose to participate in the study completed a survey in two parts: a pre- and post-survey. Each part of the survey comprised both quantitative (mainly Likert scale styled) and qualitative (open-ended) questions. The pre-survey was administered at the beginning of the semester just before using *MAT*, and asked for learner profiles and attitudes for an unfamiliar but expected online learning tool. The post-survey was administered at semester end and sought student perspectives on experiences with *MAT* in their learning. Each of the teachers of the classes chose to participate in the interviews, or 'interactive process interviews' (Colasante, 2011), which involved them first demonstrating and explaining their class use of *MAT*, followed by a semi-structured interview. The interviews, along with learning artefact analysis, occurred after the academic semesters, when all participating students had finished their activities in *MAT* and all assessment results were finalised.

Table 1: Student participation levels in the study.

Case	Class size	Pre-surveys completed	Post-surveys completed
Education (literacy)	18	15 (83%)	12 (67%)
Education (visual arts)	59	18 (31%)	13 (22%)
Chiropractic	78	39 (50%)	37 (47%)
Medical Radiation	57	36 (63%)	33 (58%)
TOTAL	**212**	**108 (51%)**	**95 (45%)**

The two education cases, visual arts and literacy, used *MAT* in first semester 2011; the two health cases, chiropractic and medical radiations, second semester. The classes ranged in size from 18 to 78 and student survey participation rates ranged from 22 to 83 per cent. Across the four cohorts, 108 pre-surveys and 95 post-surveys were completed (Table 1).

4 DISCUSSION OF PRELIMINARY FINDINGS

At this work-in-progress stage, there are mixed findings emerging related to *MAT*'s effectiveness in engaging students across the four undergraduate cases—which tends to raise questions for further analysis as the project is completed. However, from this early analysis point an interesting divergence in findings can be demonstrated.

4.1 Basic Interaction

On the surface, it is inferred that there was considerable activity in *MAT* across the four undergraduate cases. Artefact analysis of basic activity (i.e.: active in at least one of the following: added media, created a marker, communicated in *MAT*) illustrates high rates of interaction with *MAT* by students of the chiropractic and the two education cases; while just under half of the students engaged with *MAT* for the medical radiations class (Table 2).

Table 2: Basic student activity levels in *MAT*.

Case	Students active in *MAT*	Marker average (range)/student; total	Videos used in *MAT*
Education (literacy)	17/18=**94%**	3 (0-17) **58**	30
Education (visual arts)	53/59=**90%**	4 (0-16) **231**	112
Chiropractic	75/78=**96%**	Vid 1: 15 (13-23) **1161** Vid 2: 7 (2-17) **512**	1 1
Medical Radiation	28/57=**49%**	10 (0-58) **276**	10

These patterns of interaction are validated by teachers, but do not tell the full story. On deeper analysis of the patterns of interactions, it was realised that education student cohorts had alternative means for presenting their video artefacts, rather than using *MAT* only (due to

technical difficulties for some students). Consequently, not all students uploaded their videos in *MAT*; some submitted their videos by other means for proof of storybook creation for literacy, and for visual arts the teacher expected one video upload per week over a 10 week period while the average upload was two videos per student. In education-literacy only seven were annotated (some quite extensively); education-visual arts videos were annotated sporadically. The high rates of chiropractic student interaction with *MAT* are associated with learning that formed a required part of the learning program and assessment. Alternatively, the significantly lower interaction with *MAT* use by the medical radiations and education students reveals that the *MAT* learning activities were encouraged but voluntary.

Additionally, looking at the education cases, the students were in the main active video up-loaders in *MAT*. The education cohorts each came close to averaging two student-produced videos per student—although the range was 0-9 per student—compared to the health cohorts where the teachers (or their support personnel) uploaded professionally produced videos. These results indicate that not all education students were highly active in the *MAT* space as was intended in the curriculum design.

Self-reporting by survey participants supports that time was spent with *MAT*. Two post-survey questions on this reveal that students tended to use *MAT* in either regular patterns (weekly or twice weekly), or irregularly in intense bursts around times of video availability in *MAT* or just before assessment due dates. A minority used *MAT* rarely or not at all in each of the cohorts apart from chiropractic (23% for medical radiations, 17% for education-literacy, 8% for education-visual arts). The chiropractic students reported as the most frequent users of *MAT*. A question on time spent on average in any one episode reveals that 15 to 30 minutes is the most common time commitment using *MAT* across the four cohorts, with a spread of less than 15 minutes through to approximately two hours. It is notable that three out of the four cases (all but education-literacy) had a small percentage of students spending one-and-a-half hours or more in single episodes using *MAT*.

While time engaged with *MAT* is a useful indicator—indeed time on task is one of the time honoured 'seven principles of good practice in undergraduate education' (Chikering & Gamson, 1987; Chickering & Ehrmann, 1996)—these figures don't tell us whether the time was devoted to quality learning or time spent navigating a new tool.

4.2 Deeper Engagement

While student interaction with the tool is evident from the data, learner engagement on a deeper level appears more sporadic across the four cases. For example, when asked questions on learning effectiveness and preference of using *MAT*, the survey responses vacillated wildly between the cases. Figures 2 and 3 illustrate this picture, and by extension raise further questions about the factors of variance (Section 4.3).

The most striking variations are the peaks between education-visual arts and chiropractic (Figure 2), where two-thirds of the former disagree (67%) that *MAT* allowed them to be challenged in an interesting way, while a similar number in the latter agrees (69%). Even so, each cohort has at least some polar opposite opinion within their own ranks; with one-quarter education-visual arts respondents agreeing they were challenged, and one-eighth of chiropractic respondents stating they were not.

Relative to this, the education-literacy and medical radiations cohorts were more mixed within their own cases on this question. In the education-literacy case, two-fifths (42%) were neutral compared to those that agreed that they were challenged in an interesting way, while in medical radiation, just under one-quarter (23%) disagreed when over half agreed (57%).

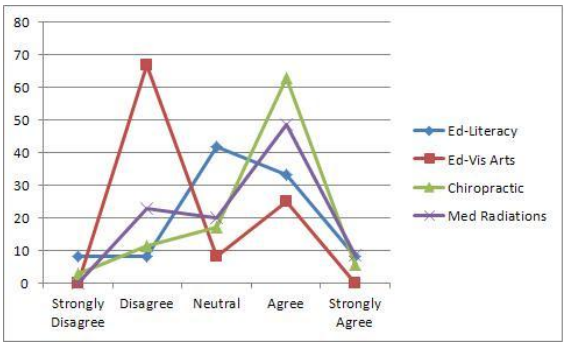

Figure 2: *MAT* allowed me to be challenged in an interesting way (%).

To the question of *MAT* allowing them to build or construct meaning from their learning experiences, Figure 3 paints a similar picture of opposite peaks between the education-visual arts and chiropractic cohorts, although a few more neutral responses soften the decisiveness a little. Medical radiations almost mirrors the response patterns to the previous question, albeit slightly stronger with two-thirds (67%) agreeing. Education-literacy sees the most change between this and the previous question,

with half disagreeing on this question and one-quarter agreeing.

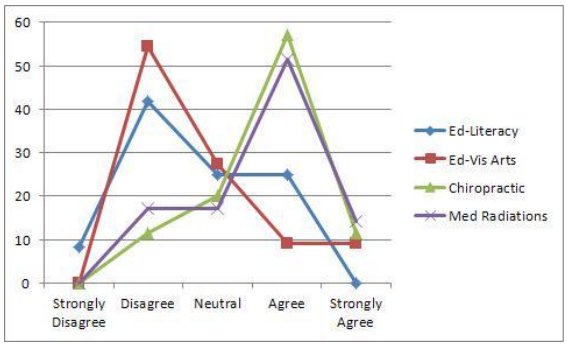

Figure 3: *MAT* allowed me to build or construct meaning from my learning experiences (%).

4.3 Case Contexts

The question of case contexts and uses of *MAT* was raised in the previous discussion in light of the mix of polar and indecisive case representation of learning experiences. In response to this, the following case context data is presented and discussed to illustrate some of the characteristics of the four undergraduate cohorts, including:

- How *MAT* functionality was used across the cases;
- Student perspectives on:
    - preferences of online learning compared to face-to-face;
    - barriers to learning using *MAT*.

These follow in the order of: student attitudes to online learning; case uses of *MAT* as related to Kirkwood's (2009) functions of educational technology; ideas emerging on engagement; and then perceived learning blockages while using *MAT*.

4.3.1 Student Attitudes to Online Learning

As an indication of preference for online compared to face-to-face learning, figures 4 and 5 show student preferences pre- and post-*MAT* use. Figure 4 offers something interesting; the learner cohorts who responded the greatest disagreement to the questions on learning satisfaction with *MAT*, i.e.: the two education cohorts, had indicated in the pre-survey less preference for using an online tool to help them achieve learning outcomes aligned to *MAT* use.

However, this is relative to the other cases and not a definitive factor, as still half of the education-visual arts students surveyed agreed overall (50%), while around one-fifth (22%) disagreed (Figure 4). For education-literacy, outside a large neutral response only one-fifth agreed to preference for an online tool (20%) while one-third disagreed (33.3%). Compare this attitude to pre-*MAT* agreement from four-fifths of the chiropractic respondents (79%) and most of the medical radiation respondents (90%), with almost negligible disagreement from these two cohorts.

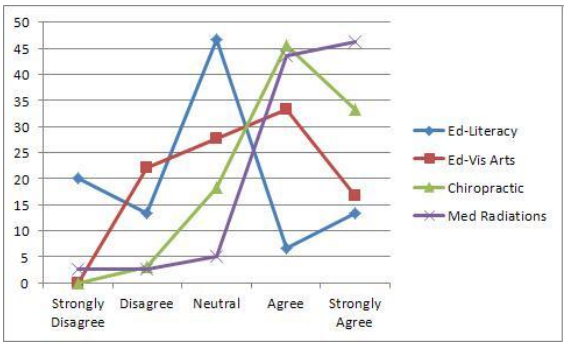

Figure 4: I would like to use an online tool to help me to … (achieve the various intended learning outcomes) (%).

The education-literacy cohort remained consistent with their pre-survey attitudes after using *MAT*. Figure 5 illustrates the responses to the post-survey question on whether they would have preferred face-to-face discussions for their learning instead of using *MAT*. From the education-literacy cohort there is striking agreement to face-to-face preference over *MAT*. There is also striking non-decision on this question from the education-visual arts cohort, and a mixed response from both chiropractic and medical radiation cohorts including substantial non-decision.

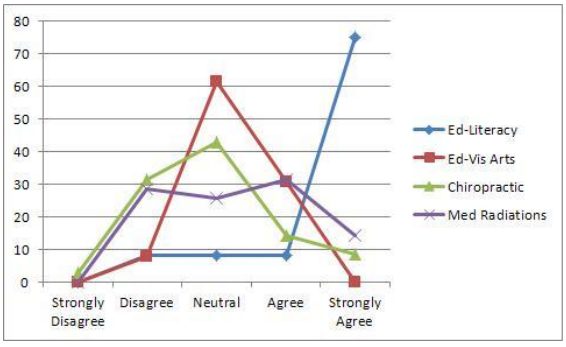

Figure 5: I would have preferred to have face-to-face discussions about the learning instead of using *MAT* (%).

4.3.2 *MAT* Integration: Comparisons and Contrasts across Cases

The four cohorts, apart from using *MAT* over the typical undergraduate semester, had quite different purposes for *MAT* integration (Section 3.1). Their learning activities directly involving *MAT* varied

including using different features of the tool. Using Kirkwood's (2009, p.108) functions of educational technology as categories (quoted in italics below), a snap shot of *MAT* integrations harnessed from teacher interviews and supported by artefact analysis data, is tabled below.

Table 3: Case uses of *MAT* (from teacher interview data) aligned to Kirkwood (2009) functions of ICT in higher education.

ICT Functions (Kirkwood, 2009, p.108)	Education-literacy	Education-visual arts	Chiropractic	Medical radiations
presentation – making … resources ([e.g.:] … moving images, etc.) available for students to refer to, either at predetermined times or 'on demand'	Students created own videos, including a supervised sample video to upload as an example.	Students created own videos; initially the teacher uploaded two example videos to demonstrate both good and poor quality.	Clinical episode (enacted by chiropractic expert and staff) presented in stages in two separate videos released progressively over the semester.	Expert modelling (slowed down & spoken aloud by a radiographer) of x-ray critique process, 10 scenarios in 10 videos, released in two batches over the semester.
interaction – enabling learners to actively engage with resources, to manipulate or interrogate information or data	Upload own video/s; Analyse a peer's video content & select areas to, name, categorise & enter peer feedback.	Upload own videos; Analyse own video content; tag videos with key words; optional: select areas to name, categorise and enter notes.	Analyse presented video content; select areas to name, categorise & enter notes; collaborate then further annotate videos.	Analyse presented video content; Select areas to name, & enter notes.
dialogue – facilitating communication between teachers and learners or between peers for discussion, cooperation, collaboration, and so on	Students in one group could view whole class' videos; pairs were to give peer feedback to each other's videos using the markers and 'Notes' (not all did)	Students in two class groups could view their group's videos, tags & any annotations; comments were more often for self than for others.	Individual analysis then small group comparison & collaboration to achieve set goals, using annotation & communication areas in *MAT* &/or methods	Students in small groups could view group members' video annotations (did not tend to leave comments for each other beyond own study type entries).
	Teacher feedback given via the general communication area, not linked to specific video segments but to their individual video/s	Teacher feedback was not given within *MAT*	Teacher feedback given via the 'Teacher Feedback' annotation panels anchored to only specifically targeted marked video segments	Teacher feedback given via the 'Teacher Feedback' annotation panel on all markers students annotated/ showed engagement/ made effort
generative activity – enabling learners to record, create, assemble, store and retrieve items … in response to learning activities or assignments and to evidence their experiences and capabilities	Students created a draft storyboard, videoed this work & uploaded to *MAT*	Students created videos of their work as artists & of art spaces & uploaded to *MAT*	Students did not create own videos	Students did not create own videos
	Several students only created multiple markers across the timeline of a peer's video.	Created general tag names for their videos; some left notes in markers or general comments area.	Groups generated marker categories from 1st video to analyse 2nd video; all students created multiple markers across both videos	Some students created multiple markers across the timeline of some of the videos
	Not assessed	Not assessed	Activities in *MAT* were assessed	*MAT* activities could aid exam preparation

Kirkwood (2009) noted the next frontier for ICT in higher education was to extend or transform, rather that replicate or add to current teaching methods, enabling "learning activities or situations that would otherwise be extremely difficult to achieve and to facilitate qualitative improvements in learning outcomes" (p.108). At this preliminary stage of data analysis it is difficult to determine whether student learning has extended to levels of transformation with *MAT*. Yet in the health cases, having access to industry representatives via video has offered repeat access to expert perspectives, and in chiropractic, this has enabled access to case demonstrations earlier in the learning program than previously. This will be an area for further investigation.

4.3.3 Emerging ideas on engagement

Kirkwood argues on two fundamental elements for effective use of educational technology, "(1) variations in users' conception of teaching and learning, and (2) the primacy of assessment requirements" (2009, p.110). The preceding discussion has included student online/face-to-face preferences and details (compares and contrasts) the varying functional foci across the cases giving us a glimpse into the teacher role, including whether assessment was a factor of *MAT* activities (Section 4.3.1 and 4.3.2).

As early adopters of a new tool, the team of teachers volunteered for the project without established and proven ways of using *MAT* (apart from the pilot study), knowing that there were no guides as such, but rather models; while teaching and student guides would be end products of the project. Professional development and support related primarily to technological use due to the real need to learn how to use the new technology. However, from the discussion in the paper, the following ideas emerge as practices that assisted students to engage with *MAT*.

Higher satisfaction responses by students were presented in *MAT* cases that had some or all of:

1. teacher presentation and upload of videos in *MAT* (compared to student generation and upload of videos)
2. teacher feedback
3. learner-learner interaction to achieve meaningful goals
4. formal assessment requirement.

The last three points would hardly draw argument, as they are part of well-established principles for student centred or active learning (e.g.: Biggs & Tang 2007; Boud et al 2001; Boud & Falchikov, 2007; Weimer, 2002; Herrington et al, 2010; Garrison & Vaughan 2008). However, the first point needs to be further explored, as it does not sit easily with the widely accepted notion of active learning as more beneficial than passive learning. Students generating media, compared to being presented with media, is certainly more active on a passive to active continuum. Yet the students reported less willingness to engage with *MAT* if they were actively creating and uploading their own video media (i.e. the education cases).

The current digital climate sees a 'new culture of learning' that enables students to go beyond 'knowing, making and playing' in a traditional sense; students can make, shape and manipulate media as an integral part of their learning processes (Thomas & Brown, 2011). So, in this climate, what does the first point allude to? Could it be that the education students are not typical digital natives who are expected to be familiar with and stimulated by ICT? Do they have a higher percentage of students with a 'passive conception' of learning (Saljo, 1979, in Kirkwood, 2009), and that while not happy with their experiences with *MAT*, may have successfully developed and extended (Perry, 1970, in Kirkwood, 2009) in the act of finding themselves thrust in a creative role? These are questions raised but as yet unanswered.

4.3.4 Barriers to Engagement

Although Kirkwood (2009) states effectiveness is less about the tool and more about how it is used, *MAT* is new so technological barriers also need to be considered. In aiming to isolate any blockages that may have affected the students' learning with *MAT*, one of the qualitative questions in the post-survey asked an open-ended question regarding if there was anything about *MAT* that blocked them moving forward in their learning. Out of the responses given (not all chose to answer this question) themes emerged that fell under either umbrella of technical or pedagogical issues (Table 4 and 5).

Student generation and upload of videos should have provided active, deeper learning experiences. Perhaps the technological difficulties noted by the learners of the education cohorts, mixed with their self-reported preference for face-to-face learning over online learning (Section 4.3.1) affected their engagement. However, Kirkwood's (2009) argues that technology limitations is not the greatest barrier to engaging effectively with online learning, but rather it is how it is used, integrated and aligned with

expectations between students and teachers.

Table 4: Things about *MAT* that blocked students moving forward in their learning: (a) Technical Difficulties.

Case	Technical Difficulties
Education (literacy)	Most common response was difficulty uploading videos, e.g.: "*I had problems to upload [sic] my draft video within uni or at home";* *"Take[s] long time to upload files."*
Education (visual arts)	Most common response was difficulty uploading videos, e.g.: "*It was hard to upload videos – it took ages to upload (all night)";* *"if the video didn't upload, you were unable to follow through with class tasks*".
Chiropractic	A minority noted access/usage issues, e.g.: "*the site was occasionally very difficult to use";* *"not the smoothest website, but once you knew how everything worked, it was alright, however slow".*
Medical Radiation	A minority noted general tech issues, e.g.: "*was complicated and confusing to use";* *"user interface was not very use [sic] friendly*".

Table 5: Things about *MAT* that blocked students moving forward in their learning: (b) Pedagogical Issues.

Case	Pedagogical Issues
Education (literacy)	One only noted participation levels, i.e.: "*Other students not spending much time on MAT. It should be graded to compensate for ppl [people] spending lots of time on it*"
Education (visual arts)	Some did not see the relevance of *MAT*, e.g.: "*There was emphasis on putting things up but felt like it was pointless.";* *"didn't really see the purpose of it."*
Chiropractic	A minority criticised the group formations and related participation, e.g.: "*not being able to choose our own group members*"; "*not all group members participated which made it hard to come up with decisions as a group*"
Medical Radiation	A minority would have preferred to do their own image critiquing in *MAT* (rather than watch an expert), e.g.: "*we weren't able to attempt critiquing the images ourselves as [the expert] did it already*".

This argument provides the opportunity to revisit Barkley's (2010) theorising on the complexity of student engagement for learning where both motivation and active learning synergistically interact. From the preliminary data analysis it seems that there are two dominant project foci to i) provide technical support for the project's teachers and students; and ii) develop and share learning and teaching strategies that focus on active learning within the project teaching teams.

For some students (almost half the students), *MAT* provides positive influences as they engage in their learning actively through positive challenge and meaning making (refer to Figures 2 & 3). Yet there seems to be another factor that contests a deeper engagement for learning with *MAT*. While the design and use of *MAT* fosters active learning, the other element of student engagement - motivation - seems to have become lost in implementation in some of the cases. As Barkley (2010) argues, motivation incorporates a mix of self-perception, insights, dispositions, skills, expectancy and value that will influence the student's will to learn.

With this insight in mind, returning to Table 4, there is a sense that while students were actively learning with *MAT*, their sense of purpose or value of using *MAT* for their learning is diminished. The students' comments such as the need 'to compensate' for time spent on *MAT* in assessment; the feeling that 'it was pointless'; they wanted choice in their peer partners; and lack of opportunity to create their own videos – are at the heart of the construct of motivation for learning. These students are demonstrating a lack of motivation in the use of *MAT* as they are searching for a deeper engagement with *MAT* for their learning. If "motivation is the portal to engagement", as Barkley (2010, p. 15) contends, then there is a need for further thinking about how *MAT* might be used to increase motivation for students in their learning. As a tool that is directly reflective of work integrated learning, *MAT* has the *potential* to engage students in their professional learning. Further analysis of the project's data hopes to shed light on how the authenticity of *MAT* learning activities might be used to help bolster the motivation element of student engagement.

5 NEXT STEPS

Project completion includes finalising the data analysis and preparation of report. Additionally, by evaluating *MAT*'s effectiveness in the varied contexts, models of work-relevant learning are

emerging that optimise virtual, authentic learner engagement. *MAT* guideline booklets for use, student and teacher versions, are currently under development as informed by the project experiences. These models of use and the development of supporting guidelines will then be available to support further use of *MAT* and—as new products—be open to further (post-project) evaluation.

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REFERENCES

Andrews, R., Haythornthwaite, C. (Eds), 2007. *The SAGE Handbook of E-learning Research*. Los Angeles: SAGE Publications.

Barkley, E. F., 2010. *Student Engagement Techniques: A Handbook for College Faculty*. Jossey-Bass. San Francisco.

Biggs, J., Tang, C., 2007. *Teaching for quality learning at university: What the student does*. (3rd ed.) Maidenhead & New York: Society for Research into Higher Education & Open University Press.

Boud, D., Cohen, R., Sampson, J. (Eds.), 2001. *Peer Learning in Higher Education: learning from & with each other*. London: Kogan Page.

Boud, D., Falchikov, N. (Eds.), 2007. *Rethinking Assessment in Higher Education: Learning for the longer term*. London and New York: Routledge.

Chickering, A.W., Ehrmann, S.C., 1996. Implementing the seven principles: Technology as lever. *American Association for Higher Education Bulletin*, 49(2), 3-6. Retrieved online 9 January 2012 from http://www.aahea.org/bulletins/articles/sevenprinciples.htm.

Chickering, A.W., Gamson, Z.F., 1987. Seven principles for good practice in undergraduate education. *American Association for Higher Education Bulletin*, 39(7), 3-7. Retrieved online 9 January 2012, via http://www.aahea.org/bulletins/articles/sevenprinciples1987.htm.

Colasante, M., 2011. Using video annotation to reflect on and evaluate physical education pre-service teaching practice. *Australasian Journal of Educational Technology*, 27(1), 66-88. Via http://www.ascilite.org.au/ajet/ajet27/colasante.html

Garrison, D. R., Vaughan, N. D., 2008. *Blended Learning in Higher Education: Framework, Principles, and Guidelines*. San Francisco: Jossey-Bass.

Herrington, J., Reeves, T. C., Oliver, R., 2010. *A guide to authentic e-learning*. New York and London: Routledge.

Kirkwood, A., 2009. E‐learning: you don't always get what you hope for. *Technology, Pedagogy and Education*, 18(2), 107-121. Via http://www.tandfonline.com/doi/abs/10.1080/14759390902992576

Jung, B., Yoon, I., Lim, H., Ramirez-Weber, F., Petkovic, D., 2006. Annotizer: User-friendly WWW annotation system for collaboration in research and education environments. Paper presented at the *IASTED Web Technologies, Applications, and Services*, pp.113-118.

Lai, K. W., 2011. Digital technology and the culture of teaching and learning in higher education. In Hong, K. S., and Lai, K. W. (Eds), *ICT for accessible, effective and efficient higher education: Experiences of Southeast Asia. Australasian Journal of Educational Technology*, 27(Special issue, 8), 1263-1275. http://www.ascilite.org.au/ajet/ajet27/lai.html

Lid, V., Suthers, D., 2003. Supporting online learning with an artifact-centered cross-threaded discussion tool. In Chee, Y. S., Law, N., Suthers, D., and Lee, K. (Eds.), proceedings of the *International Conference on Computers in Education 2003*, December 2-5, Hong Kong

Silverman, D., 2005. *Doing qualitative research*. (2nd ed.). London: SAGE Publications

Swan, K., 2004. *Relationships between interactions and learning in online environments*. Learning, 3, p.A collection of research findings and their implic. © Sloan-C. Retrieved online 10 January 2012, via http://www.sloan-c.org/publications/books/pdf/interactions.pdf.

Thomas, D., Brown, J.S., 2011. *A new culture of learning: Cultivating a culture of imagination in a world of constant change*. Seattle, WA: CreateSpace Publishing.

Weimer, M., 2002. *Learner-Centered Teaching: Five key changes to practice*. San Francisco: Jossey-Bass.

Yin, R. K., 2009. *Case study research: design and methods*, 4th ed. Los Angeles, Calif.: Sage Publications