Motivation and satisfaction for vocational education students using a video annotation tool

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This paper examines the use of a specific contemporary technology in tertiary education that of a video annotation tool, *MAT*, in four vocational learning cohorts. These students, enrolled in property services and audiovisual technology courses, analysed representations of workplace issues in video. These videos included industry interviews, acted examples, and student-performed role-plays. Student analysis was evidenced—and shared with peers and/or teachers—via electronic annotations anchored to key points within the video media. The findings in this paper focus on the motivation and satisfaction of these vocational students in their video annotation activities using Bekele's (2010) conceptual framework of factors attributing to success in online learning. Overall, students' perceptions of this electronic learning method tended to indicate satisfaction across a range of factors, with clues for improvements in tool and/or learning design support, and that the innovation is worthy of ongoing trial and refining from lessons learnt.

Keywords: video annotation, vocational education, property services, audiovisual technology

Introduction

A multiple-case study within an Australian university saw a media (video) annotation tool (*MAT*) introduced across a range of disciplines and tertiary sectors, including four cases from the vocational sector. The four vocational cases comprised three different property services cohorts and one audiovisual technology cohort. *MAT* is a learning tool that allows upload and granular annotation of video. As could be expected, the videos analysed in *MAT* had vocational focus, such as interviews with industry representatives, acted workplace case examples, or student role-play of work roles. See Table 1 for a summary.

Table 1: The four vocational *MAT* cohorts

Code	Level	Case cohort	Subject theme	Video/s for analysis in *MAT*
AV	Diploma	**Audiovisual Technology**	Quality service	2 x commercially acted workplace customer experiences (examples)
PD	Diploma	**Property Services** (Asset and Facilities Management)	Customer service and leadership	1 x interview; senior industry representative (large company)
PT	Certificate IV	**Property Services - Traineeship** (Operations)	Customer service	3 x interviews; industry representatives (various companies)
PO	Certificate IV	**Property Services – Owners' Corporation** (Specialised)	Conducting meetings	4 x student team role-plays; industry-styled meeting

Annotations were created by selecting and categorising segments of video content, and then adding notes. Where the learning design accorded, this then built into collaborative threaded discussions anchored to the video segments. The audiovisual technology cohort utilised individual student - teacher annotations, while each of the property services cohorts involved small group learning design involving student - student - teacher annotations. All four cohorts analysed their videos in both the physical classroom and the online classroom concurrently (an increasingly accustomed environment), along with opportunities to continue presence in the online classroom beyond the boundaries of the tertiary timetable.

The data that informed the findings involved a triangulation of student pre- and post-surveys, student and teacher interactive process interviews (observation/demonstration and semi-structured interviews), and artefact analysis. The literature framing the vocational cases focused on online learning engagement with content, and content suitable for presentation in video for learning interaction and workforce preparation, such as professional case studies and role play/simulated performance. Synthesis of data presents the findings themed in recognised motivation/success factors (as aligned to Bekele, 2010).

Learning engagement with online content, including video content

Learning generally involves making meaning of learning content, from passive transmission methods through to active consumption such as analysis and discovery learning. Collaborative analysis of learning content has been used successfully in traditional classrooms, and increasingly elaborately in technology-supported learning. An example of classroom collaborative analysis as used by Black (1993) involved students writing their own ideas of a chemical topic, redistributing, then volunteers read out 'quite good' examples. This approach gathered momentum with the students "and after pulling three or four answers together with some discussion of the merits of each, the class had developed a very complete understanding of the [chemical] concept … [and] the answers also allowed us to clarify some misconceptions" (Black, 1993, p.143). Educational technology extends the possibilities of content analysis and collaboration:

> Collaborative learning can enhance knowledge acquisition, and, when coupled with the use of digital technology, it can aid in the generation of creative thought processes through the provision of a shared electronic space within which learners are encouraged to take risks, make mistakes and think critically as they work together (Wheeler, Waite and Broomfield, 2002, in John & Wheeler, 2008, p.38).

As others before him, Bekele (2010) recognised that a single factor (such as the educational technology employed, e.g. Kirkwood, 2009) does not alone cause success, but "[p]resumably, technology, course, and support factors mutually affect success measures" (Bekele, 2010, p.118). A meta-analysis study by Bekele (2010) examined 30 published studies for factors of success with online learning environments (with or without a face-to-face learning component). These 30 studies each sought to measure motivation and/or satisfaction. From his findings, Bekele (2010) developed a conceptual framework based on a range of factors he found affected success (see Table 2). Bekele grouped the last four factors together under 'motivation'. Motivation has already been highlighted as a factor for engagement with *MAT* activities in four undergraduate case integrations (see Colasante & Lang, 2012).

Table 2: Bekele (2010) conceptual framework of factors affecting internet-based learning success

Bekele (2010) factors		Detail
Technology factors		technology attributes; student ICT skills, experiences, or views, e.g. technology is easy/friendly; perceived or actual use/function of technologies, e.g. dependable access
Course factors		quality elements in course design, e.g. course relevance, organisation, goal clarity, flexibility; the 'how' of learning, e.g. problem based, process oriented
Support factors		technology leadership and support provided by faculty/tutors, administrators, and peers
	Task choice	student choice of task(s); availability of ample activities, resources, and technologies to freely choose from; student choice of time and place of learning
	Effort	constant challenge and/or effort; need to expend a reasonable amount of effort
	Persistence	time spent on-task; continue working despite any obstacles encountered, e.g. technicalities, support systems, group dynamics, and thinking skills obstacles

Achievement	level of achievement; achievement demonstrated via task choice, effort and persistence

Two decades ago educational video was considered expensive, raising the question "could video material provide worthwhile material that could not be provided more cheaply using other media?" (Rowntree 1990, p.256). Early use of video to connect learner and teacher included a "stiff, unemotional 'talking head' of a professor or tutor" (McGreal & Elliott 2008, p.147). Now video is easier to procure and can represent learning content of infinite topics ready for interaction via modern methods, such as individual or collaborative textual annotation (e.g. Rich & Hannafin, 2009). Representation of vocational case examples for analysis, video recordings of student role-play/performance, and granular analysis of video content are discussed below.

Vocational case examples in guided video-case analysis

Authentic case representations – in written, video, or other format – can help to develop and/or apply work-ready skills, such as social interactions, negotiation, problem solving, and critical thinking knowledge and skills (Bennett, et al., 2002). Bennett, Harper, and Hedberg (2002) contrast case-based learning to problem-based learning (which asks students to establish solutions) to that of opportunities to learn from past case experiences of people in their discipline fields. While this may involve experts from the field, Bennett et al (2002) note 'exemplars' or excellent examples are not necessary; rather cases that illustrate "the complexities and contradictions inherent in realistic situations" (Spiro & Jehng, 1990, in Bennett et al., 2002).

Video recordings of student role-play

Facilitating learning via role-play is an established teaching strategy for interactive skill development of interpersonal skills (e.g. for human services professionals, Johnson & Douglas, 2010). It also promotes team decision-making, professional communication, and can help "students develop abilities in problem solving by requiring them to assume different roles and confront unstructured problems in scenarios involving the professional domain of the given role" (Hou, 2012, p.211). Role-play remains important in learning as it offers "a deeper kind of learning … the ability to see the world from different points of view" (Dalziel, 2010, p.56). This deeper learning arises mainly from post role-play reflection (Dalziel, 2010), and video can aid this reflection on role-play (e.g. Walter & Thanasiu, 2011; Robinson, 2007).

Granular analysis of content

Analysis of content, in fine or course granularity, is supported by segmentation of content data into discrete chunks (e.g. Medina & Suthers, 2008). A text-based segmentation example involved postgraduate education students using a wiki to 'sketch-thread-theorise' (Davies, Pantzopoulos & Gray, 2011), where students were asked to note their own professional accounts, highlight key segments and draw out keywords, and then annotate with their reflections and associated theories. This activity was combined with peer contributions and formative feedback, and was found to create "a rich learning environment where professional outcomes were enhanced" (Davies, et al., 2011, p.810). The *MAT* annotation system allows for segmentation of video. For example, undergraduate chiropractic students analysed segments of a videoed chiropractic clinical case by selecting, categorising and adding their reflections and theoretical knowledge to each selected segment (to build clinical notes and a working diagnosis) with largely positive findings (Colasante, Kimpton & Hallam, in press).

Methodology

The methodological approach was via a multiple-case study, with mixed-method data collection. The project sought to examine the use of *MAT* across different industry disciplines and tertiary sectors. Nine class cohorts who identified as using *MAT* for work-relevant themes were invited to participate, four of which were from the vocational sector and form the focus of this paper. Therefore, case selection was purposive as they comprised teachers and students who were (a) early adopters using *MAT* for (b) work-relevant and/or industry partnered themes. Purposively selected cases are recognised particularly in qualitative studies to deliberately select cases or units that can help answer specific research questions (Teddlie & Yu, 2007).

The mixed data collection methods harnessed both qualitative and quantitative data from students and qualitative feedback from teachers. The methodology was trialled in a pilot-case study in preparation for the multiple-case study (Colasante, 2011), therefore, this project benefited from pre-tested instruments following minor design adaptation. Methods included pre- and post-survey, observation/demonstration, interviews, and artefact analysis. University ethics approval was granted to conduct the research.

Data collection

The vocational students using *MAT* were invited to complete a survey in two parts; a questionnaire before using the new tool, and another after. Both questionnaires included primarily quantitative questions (mostly Likert-scaled), and a minority of qualitative questions. The pre-survey established demographic detail and attitudes to online learning, while the post-survey harnessed student opinions of their experiences of learning with *MAT*. Further to this, both students and teachers were invited to participate in individual 'interactive process interviews' or IPIs (Colasante, 2011). These involved half-hour observation/demonstration and interview sessions, involving 10-15 minutes of observation while using *MAT* and think-aloud protocol, followed immediately by 10-15 minutes of semi-guided discussion on their experiences using *MAT*. In all vocational cases, the *MAT* activities had concluded by the time of interview, therefore participants were asked to demonstrate and talk-through their activities in the first part of the IPI session. Additionally, student and teacher participants were invited to allow specific *MAT* related learning and assessment artefacts to be used for purposes of the study, to compliment general *MAT* learning analytics (general analytics are used in this paper).

The classes ranged in size from 20 to 39 (sum of 110 students). Student research participation rates (Table 3) ranged from 23 to 69 per cent for the surveys (59 pre-surveys and 37 post-surveys completed across the four cases). Student participation numbers in IPIs were low, however, formed a useful source for clarification.

Table 3: Participation levels in the study

	Class size ^	Pre-surveys completed	Post-surveys completed	IPI participation Students	IPI participation Teachers and Teacher assistant	
AV	39	18 (46%)	13 (33%)	1 student	1 teacher	1 assistant**
PD	22	13 (59%)	5 (23%)	1 student	1 teacher*	1 assistant**
PT	20	8 (40%)	10 (50%)	2 students	1 teacher*	
PO	29	20 (69%)	9 (31%)	2 students	1 teacher*	1 assistant**
Sum	**110**	**59**	**37**	**6**	**3**	

^ Class size represents number of students enrolled, not the number of students who actively attended classes.
* Same property services teacher, therefore IPIs conducted in 1 sitting.
** Same teacher assistant, therefore IPIs conducted in 1 sitting.

Limitations
For ease of comparison between cases, survey data is presented in 'SSPS valid percentages', despite some cases having low participation numbers, and each case with at least some non-responses between pre- and post-surveys. With established "evidence that nonresponse can affect survey estimates" (Fowler, 2009, p.54), the percentages represent potentially biased samples of each cohort. The participation rates are given above.

Findings of motivation and satisfaction across the four vocational cases

Data analysis findings from the four vocational cases, one audiovisual technology and three property services cohorts, present here under the Bekele (2010) factors for success with 'Internet-Supported Learning Environments' of: technology, course and support factors, and then the four motivation factors of task choice, effort, persistence, and achievement. These factors theme findings from across the data range of student pre- and post-surveys, student and teacher IPIs and general learning artefact analysis harnessed from within *MAT*.

Demographically, the gender mix of respondents across the four cases was predominantly male (approximately 90%) in all but the PO case, which had an almost even mix (53% male). The age range demonstrated a typical post-secondary age range for AV with a minority of mature-aged students, compared to the three property services cohorts, which each represented a mature-aged student base. There was a dominance of EFL (English first language) respondents across the four cases.

Technology factors

Pre-survey data illustrated ICT access to technology and skills and attitudes towards learning with technology across the cases. A majority reported daily access to computers and the Internet while a minority reported access most of the time (5 to 12%) and none reported less frequent access. Self-perceived ICT skill levels were mainly medium to moderately-high.

On whether students liked learning online, the AV cohort gave the strongest positive responses, while most of the property services students liked online learning at least some of the time and a minority (12-15%) not liking online learning (Figure 1). When questioned on willingness to use video in learning (i.e. asked in case specific questions, e.g. AV: "I would like to view customer service techniques via video footage"), there was majority agreement (Figure 2).

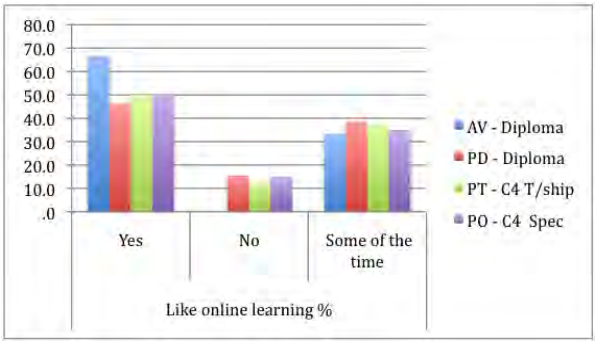

Figure 1: Pre-survey attitude to online learning: like online learning

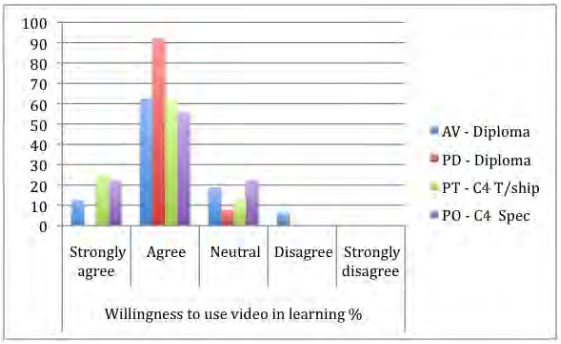

Figure 2: Pre-survey attitude to online learning: willingness to use video in learning

Two related questions (in different sections of the post-survey) directly sought negative reaction to *MAT*. Figures 3 and 4 illustrate that more appreciated the technology of *MAT* than not, indicating not necessarily finding difficulty in use and the technology not interfering with learning.

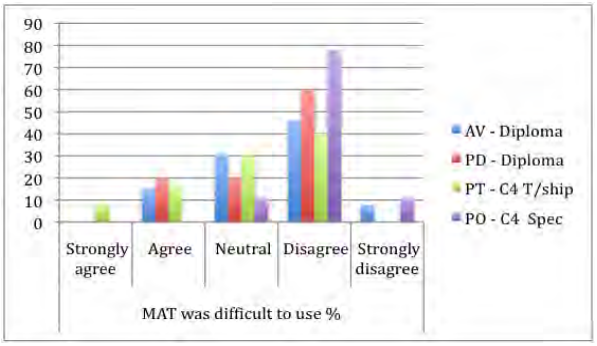

Figure 3: Post-survey attitude to ease of MAT use: difficult to use

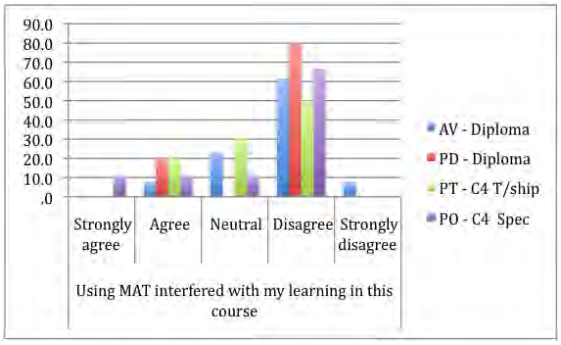

Figure 4: Post-survey attitude to ease of MAT use: interfered with learning

However, to find out where some of the technological issues lay for the minority who didn't indicate satisfaction, the post-survey open responses provided clues such as access, creation of markers and general glitches costing time. Examples of comments included:

- "there was a difficulty in accessing into *MAT* [sic.]. There should be a convenient link to be set up on the website for easier access" (AV)
- "Too many glitches" (AV)
- "if it is only employed once, it would be the learning of a new process, otherwise it is of benefit" (PD)
- "unable to access *MAT* at work or home, frustrated by system" (PT)
- "[difficulty] getting markers to span correct time duration" (PO).

Although these comments represent a small minority, they do provide alerts for future improvements to the tool (some of which have since been implemented), or potential improvements in support mechanisms for students.

Course factors

Outside the vocational cases, analysis of four concurrent higher education (undergraduate) cases of *MAT* use found that course design factors effected student satisfaction. In particular it was noted:

Higher satisfaction responses by students were presented in *MAT* cases that had some or all of: 1.

[T]eacher presentation and upload of videos in *MAT* (compared to student generation and upload of videos) 2. [T]eacher feedback 3. [L]earner-learner interaction to achieve meaningful goals 4. [F]ormal assessment requirement (Colasante & Lang, 2012, p.462).

All four vocational course designs met these four conditions excepting that while the AV case aimed for meaningful goals, it did not incorporate learner - learner interactions. Note: while each cohort had short time spans to conduct *MAT* activities, most over two to three weeks only, the PD group experienced intensive interaction at their subject's end. Course design features across the four cases are represented in Table 4.

Table 4: Course design factors involving *MAT*

	Learning objective(s)	Individual or group analysis	Teacher feedback	Industry involvement	Assessment
AV	Provide quality service to customers	Individual work	Each student received feedback within *MAT*	Not directly	Formative assessment (summative: role play)
PD	Coordinate customer service activities in the property industry Manage relationships / networks	5 groups Division of labour promoted	Spot checks in *MAT*; whole class feedback and debrief	Video: teacher interviewed industry rep from large facilities management business	Summative assessment (plus reflective journal)
PT	Implement customer service strategies in the property industry Establish networks Manage conflict and disputes	6 groups Division of labour promoted	Spot checks in *MAT*; whole class feedback and debrief	Videos: teacher interviewed three industry reps from various facilities management businesses	Summative assessment (plus reflective journal)
PO	Facilitate meetings in the property industry	4 groups Division of labour promoted	Spot checks in *MAT*; whole class feedback and debrief	Not directly	Summative assessment (plus reflective journal)

Respondent satisfaction of course design features involving *MAT* is illustrated in Figures 5 and 6. AV was the only cohort to report less than 50% satisfaction with access to expert opinion in video. Responses to an open post-survey question "What was it about *MAT* that was least helpful to your learning?" indicated that the AV video content was not as realistic/relevant/accurate as could be.

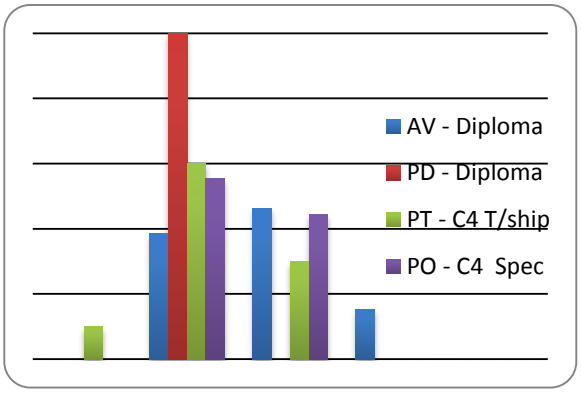

Figure 5: Post-survey satisfaction with course features: access to expert opinion

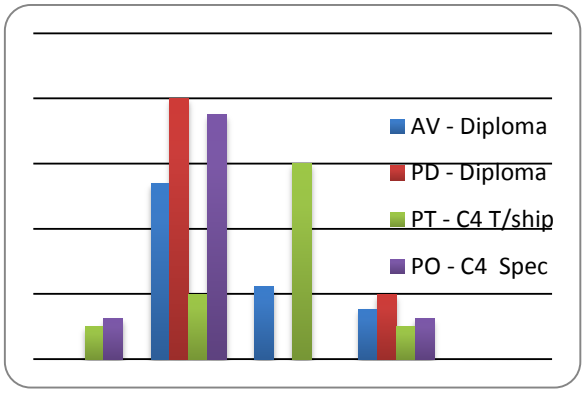

Figure 6: Post-survey satisfaction with course features: activities relevant to workplace practice

PT was the only cohort to report less than 50% satisfaction with activities relevant to workplace practice (fig.6). Neither the open post-survey responses nor the IPIs indicated a major contributing factor for this; there was generally satisfaction apart from technical issues. A high neutral response from the PT cohort may be indicative of the wordiness of the question (or inclusion of the word 'eventual' when already employed in the field). Despite the high neutral PT response, in interview one PT student articulated that he appreciated the video-

centred learning compared to traditional learning, including access to the current and relevant practicing expert's input, and learning by discovery:

> [The] process I had to follow was listen to the… [expert in the video who] told you where he worked, how many people were under him, what's critical to… his work environment, what had to be done, what not had to be done [sic.] and how he went about those things… We had to comment on set main headings and then break it down to putting it into our words, instead of the teachers coming up with the handout and saying here this is what it is, listen to this. Which I don't think it really does much because the teachers telling you where all the good points are but… in this you're finding it. (PT Student 2 IPI)

Support factors

The teacher, teaching assistant and student interviews confirmed that support was structured and delivered into each cohort, offering both technical and teaching support for at least the first class in which *MAT* was used. However, in the wider student opinion of the survey, not all explicitly agreed that '*MAT* allowed me to receive encouraging support'. While 62% of the AV respondents agreed, the remaining 38% were neutral; all remaining cohorts had majority neutral responses. The high neutral response may indicate they were unsure what the question meant (i.e. whether it meant technical support or learning support from peers and/or teacher). Upon seeking further articulation on this in the open post-survey questions, only a few AV and PD students provided clues to the ambivalence of the responses. These comments related to class time to support the learning in *MAT* (PD: *MAT* introduced late in subject), and limited collaboration and feedback from others (AV:individual activities). For example, students wrote:

- "no communication" (AV)
- "No feedback as it was last lesson" (PD)
- "Introduction into MAT was brief" (PD).

The teacher assistant interviewed noted that his classroom technical support was most needed in cohorts where students were less technologically able, including the PD students:

> I think I made a difference. Probably most in the… [PD] property services group where the people were least technology savvy and I probably had the least impact in the audiovisual group, where they seemed to be quite fluent. They were a younger demographic in the class and quite tech savvy… They [PD] were an older demographic, I think most of them worked during the day. … A few… didn't even know how to log into the system… I had to be very explicit in all of the directions in… [that] class. (Teacher Assistant IPI)

Task choice

Three themes of student choice emerged within the four vocational cohorts. The first was choice of video for the AV students, where the teacher provided "two videos… [as] it gave students an option to annotate either one" (AV Teacher IPI). The second was the choice of student groups to organise their own division of labour across each of the property services cohorts. For example, for the PT cohort, the teacher "gave them the option, they could either do it [annotate the video] themselves or they could work together in their groups and they could divide up the video and mark a section each or share the markers to mark up… and share the workload", and similarly for the PD cohort. One PD student noted in interview the interrelationships between concepts across the task division:

> my two focuses were 'customer service' and 'relationship building'… [while others had] 'communications' and 'negotiations'. They would find their block [or marker] overlapping with my block because, for instance, [the industry representative] talks about the relationship between the contractor and the consultant, and there is a lot of negotiation and communications involved in working with your consultants and your contractors (PD Student 1 IPI).

The third choice to emerge was the flexibility in annotation approach, e.g. recording the PO meeting minutes:

> They could either do it as they viewed the video in dot points… [finding] a section where something was being discussed and then they could take a minute of it with a dot point highlighted in the video and they progressed throughout the video in that format. Or some of the

> students… viewed the whole video and then just stopped it here and there and made some notations of the minutes [external to *MAT*] and then they went back and entered all the minutes in at the end (PO Teacher IPI).

MAT was set up to support both processes, with yellow marker categories, 'Note for minutes', for progressive in-video annotation, and green marker categories, 'Minutes', for summative end-of-video annotation; students could select either option.

Effort

The students who actively participated in *MAT* tended to meet their teacher's expectations of video annotations (according to the teacher IPIs). Table 5 illustrates general *MAT* learning analytics across the cohorts. In particular, it shows the number of students who participated in *MAT* activities, and of those, how many markers were created on average for each student and how many per cohort. The learning design should also be taken into account as regards to the number of markers created, including that the three property services cohorts worked in small groups and were encouraged to task delegate while the audiovisual technology students worked independently.

Table 5: Evidence of student interactions in *MAT* (harnessed by *MAT* learning analytics)

Case	Students active in *MAT*	Markers created: average (range)/student	per cohort
AV	22/39=56%	17 (1-20)	384
PD	16/22=73%	7 (2-14)	116
PT	17/20=85%	9 (1-16)	149
PO	21/29=74%	7 (3-20)	149

During analysis of the general *MAT* artefact analytics, qualitative observations were made of the students' annotations to help contextualise the figures. For the AV cohort, the annotations were mostly short, direct points of observation, although a minority provided more complex single sentences (e.g. drawing cause and effect). For the PD cohort, the total markers per student were not entirely indicative of the amount of work completed, as initial annotations sometimes sparked lengthy discussions in the threaded comment panels. While some students kept annotations to a one-sentence entry, the majority completed detailed and lengthy annotations. For the PT cohort, the majority of annotations and comments appear to be of a reasonable length (in most cases 1-3 sentences). The 'comments' panel featured frequently in this group, with many students commenting on their own or peer's markers. And finally, for the PO cohort, annotations within some markers were dramatically longer than others (e.g. markers under the marker type 'minutes' were mostly several paragraphs in length whereas 'notes for minutes' were generally 1-2 sentences). Consequently, the range quoted above may present a distorted view of and underestimate the amount of work some students achieved.

Persistence

On student persistence, two post-survey open questions yielded examples. One question asked "How did you overcome any challenges that you faced while using *MAT*?". A range of responses to this illustrated that when faced with challenges the AV students solved them by re-attempting the task or restarting the web browser, together with asking their teacher for help or applying to their real-life experiences. The PD students asked others including support staff for help or utilised trial and error as ways to solve challenges. While PT students similarly asked others for help, and employed perseverance to solve challenges, some gave up, e.g. "unable to overcome challenges due to lack of off site access" and "turning the computer off". The PO students asked others for help, or observed what others did, or re-did steps as ways to solve challenges.

Another open question, "From your experience of using *MAT*, what advice would you give to other students who might be about to use it?", also harnessed a range of responses, as summarised here. AV student advice included: follow instructions carefully, think laterally, use good video content, and work through some of the glitches. Some AV students gave *MAT* praise in their responses but one student felt it was pointless. PD, PT and PO respondents encouraged others to give *MAT* a go and to explore its features. Additional encouragement included: it is not hard to use and will help in your learning (PD), and to explore how it can be used in the

subject discipline (PT).

Achievement

All IPI participants were asked via semi-structured questioning whether the *MAT* activities helped them to achieve their class' specific intended learning outcome/s. All responded positivity to this achievement; some despite issues (see Table 6).

Table 6: Did *MAT* help students to achieve the specific intended learning outcome/s

IPI	Student (S) and Teacher (T) quotes on achieving intended learning outcome/s
AV S	The video I thought was sometimes a bit vague… in what they were asking you to find and what was actually in [the video] … In terms of the program itself it was very helpful
AV T	…it was a more effective assessment… [and] it's an indicator for me and an indicator for them about how much they know about the subject. So for me to be able to tell really quickly early on in the unit how they are with their customer service knowledge was a really great opportunity to have
PD S	This is a tricky one, 'cause I come from the industry and I'm studying something that I'm working in, a lot of this is now almost innate to me. I regularly work on these principles, so I suppose you could say it was reinforcing that at an academic level
PD T	They had to compare and reflect on it [video interview], I thought that was quite effective and I thought … a lot of learning went into that and hopefully my idea was—and I think it worked—was to work out a best practice strategy, so to use *MAT* very much as a learning tool, from a holistic perspective
PT S-1	You may have whatever knowledge you may have, but if you have someone else's experience it assists in building up that sort of a knowledge, or reinforcing it
PT S-2	It's you who's got to finish that final step and that's the video step, that you're doing the actual thing … this is putting the practical and the theory together … to put it into your own sense or see how other people do it and actually … putting it together, is a good way to know if you're understanding the subject
PT T	Yes they did [achieve] and the idea was that they would reflect on their own knowledge, which I believe they did and compare and contrast if you like what these industry experts were saying
PO S-1	Having a look at the way other people do things, and certainly making comments on other people's groups, makes you take that step back… You don't often get to critique your performance… having a look at how other professional managers do it… we're learning from our peers
PO S-2	You either achieve that or you didn't depending on the situation and the group… the dynamics in the group and whether some people role played more effectively than others
PO T	…with this particular group of students [*MAT* was used] to really provide evidence to me of their already existing skills. Although by viewing another person's meeting and not their own, it really forced a lot of learning and hopefully they all did pick up something that they didn't already know from the other students and so that peer-to-peer learning by viewing other student's video I thought was very positive

Conclusion

Findings from study participants across the four vocational cohorts (audiovisual: AV; property services: PD, PT, PO)—themed to Bekele (2010) conceptual framework factors for success with online learning—showed that for technology factors, a majority found the tool not prohibitive to their learning, although a minority had a few general issues, such as access and delay issues. For course and support factors, there was largely satisfaction, although some dissatisfaction was noted for PD participants regarding *MAT* activities not presented until near the end of their course, and AV respondents regarding quality of videos on offer plus indicators toward the individual approach being a factor. While IT and learning support was offered in all four vocational *MAT* classes, it is unclear whether students overall where satisfied with the learning support offered.

Motivation was encouraged by task choice where students were afforded flexibility via small group task delegation (PD, PT, PO) and choice between two videos to analyse (AV). Student effort was demonstrated via the general learning analytics within *MAT*, illustrating number of markers created supported by descriptors to gain a sense of effort per marker. The students found ways to continue working despite obstacles encountered by using methods such as asking for help, restarting web browser, repeating steps, or persisting in general. Advice respondents would give other students included giving *MAT* a go, explore its features, and follow instructions carefully, and also to think laterally, use good video content, and work through glitches. Achievement towards the various intended learning outcomes—as indicated by student and teacher interviews—tended to be effective, with a couple of qualifiers such as sometimes being more of a reinforcement of

knowledge than gaining new knowledge, and despite video quality in AV. Others were enthusiastic in their satisfaction with learning achievements.

Overall, students' perceptions of *MAT* from the four vocational cases indicated majority satisfaction across a range of factors, albeit with clues for improvements in technology and learning design support. This suggests that further trial and examination of *MAT* should occur in the vocational education sector, along with tool improvements and refinement of learning design and support. Detailed models for each of the four cases are currently under construction, in readiness to share with those interested in how learning design might be structured with the use of video annotation tools in vocational education.

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