



# Stakeholder perspectives on the use of VoiceThread as a multimodal alternative to conventional discussion board in distance education

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## Abstract

This pilot study explores and documents online students' and their lecturer's debut experiences of utilising VoiceThread (VT), a digital multimodal platform, as an alternative discussion space via Open Universities Australia (OUA). Feedback from the lecturer's teaching log and interview was corroborated with his OUA students' survey responses, and analysed in relation to student online learning experiences with VT and Discussion Board, as well as technological and affective aspects of both platforms. Findings indicate that VT has a stronger potential in boosting stakeholders' online engagement and enjoyment of distance learning, thus fostering online community building. Specifically, VT creates not only a multimodal and dynamic platform in lieu of Discussion Board, but a supportive online learning environment that promotes more inclusive and ongoing interactions. Despite the positive results, VT was viewed by some students as technologically demanding, causing them to only read peer posts without responding. It is suggested that orientation training sessions and trial threads be made available to ease the students into VT. Aspects of tutorial group size and instructor support should also be considered for future online course delivery.

**Keywords** Online community building · VoiceThread · Distance education · Open Universities Australia (OUA) · Supportive online learning environments · Lecturer and student perspectives

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## 1 Introduction

Open Universities Australia (OUA) has a long history as one of the largest distance learning providers in the southern hemisphere, helping to meet various academic demands of Australia's dispersed population beyond the geospatial boundaries (Reiach et al., 2012). The accelerated growth of overseas student numbers in the higher education sector has also bolstered the great demands of OUA. In 2018, international students made up approximately a quarter of both online and on-campus enrolments combined in Australian universities (Universities Australia, n.d.). Additionally, there is a steadily growing trend of domestic working professionals returning to upskill or further their education via OUA without sacrificing their full-time jobs and other commitments (Norton, 2016). While the younger generations in Australia are usually referred to as 'digital natives', many mature students and retirees also frequent the Internet on a regular basis and find online courses more convenient for them to work and study at their own pace (Evans & Pauling, 2010).

OUA offers flexible options for online students to take individual units without enrolling in a full degree; they can also withdraw anytime before the census date without penalty (Moore & Greenland, 2017). This flexibility of online courses, however, brings about its own challenges. For example, student attrition was found to be significantly higher in an online marketing course than its face-to-face version (20% vs. 13.72%; see Greenland & Moore, 2014). The difference is also evident when both blended and fully online modes are compared. Burns (2013) followed three groups of students in an Indonesian university and found that students who experienced the hybrid instruction all completed the program, whereas only 69% of their fully online counterparts did so.

As such, it is essential to understand what factors affect the student attrition rate in a fully online course, and what measures are in place to enhance student online learning and engagement in distance education. This pilot study reports on stakeholders' debut experiences of trialling VoiceThread as an alternative discussion space, and examines the benefits and challenges of utilising this multimodal tool compared to the text-based Discussion Board generally used in OUA units.

## 2 Asynchronous platforms for online discussion

### 2.1 Discussion Board (DB)

Asynchronous communication has been widely implemented in distance learning and affords learners to continue discussion on cognitively challenging content or engage in online group activities at their own pace (Watts, 2016). Palmer et al. (2008) investigated student activity in the discussion forums in two fully online Engineering and Information Technology Bachelor courses in Australia and concluded that "the work in preparing their new discussion postings assisted students

in the completion of a range of assessable tasks for the unit” (p. 847). Asynchronous e-learning is especially suitable for OUA as its student body is spread across different time zones nationally and internationally (Reiach et al., 2012). DB and emails epitomise asynchronous e-learning tools mostly utilised in the distance education sector in Australia.

However, while text-based forums provide space for discussion and contribution, they do not necessarily facilitate student participation. In fact, some features of such forums have been reported to discourage students from engaging in discussion throughout the unit. For instance, written communication requires a lot of typing and scrolling through numerous posts, which can be more time-consuming than oral face-to-face communication it is supposed to replace (Kay, 2006). Further, such communication interface does not promote or guarantee exchange of ideas, reflections, or creativity, resulting in a stack of repetitive and impersonal posts (deNoyelles et al., 2014; Kirby & Hulan, 2016). Finally, with the written mode as the only way of contribution, there is little room to accommodate different preferences and ways of learning (Kay, 2006). For these reasons, although text-based DBs are used for online discussion in most distance learning courses, online educators have started to explore other asynchronous discussion tools, such as VoiceThread (VT), that can afford multimodal communication in a social networking fashion.

## 2.2 VoiceThread (VT)

VT (VoiceThread, n.d.) is an online discussion tool that enables the teacher, students and peers to communicate, collaborate and share information using multimodal features, such as images, audios, videos and PDF documents. Different from a generic DB, VT allows users to comment on any form of digital artefacts (e.g., YouTube video clips or PowerPoint slides) and create posts using different media options (e.g., text, microphone, webcam, and phone). It is compatible with any web browser and Google Apps, accessible via any mobile device, and can be integrated in learning management systems such as Blackboard. It also provides learning analytics for lecturers to evaluate and track students’ participation in online activities.

Overall, the use of VT has been reported to be positively perceived by students (Ching & Hsu, 2013; Delmas, 2017; Fox, 2017; Sato et al., 2017) and instructors (e.g., Salas, 2014). In particular, it was found to facilitate the sense of engagement and connection in an online learning environment (Mejia, 2020). Prior studies show that discussion topics operated in online multimodal tools, such as VT, generate the highest number of message exchanges and foster more positive learner attitudes towards online discussion (Ching & Hsu, 2013; Delmas, 2017; Sato et al., 2017). In Fox’s (2017) study, students also favoured online classes conducted in a VT environment over those relying solely on text-based discussions.

Pedagogically, developing course activities that can intellectually challenge and cognitively engage online learners is positively linked to the effectiveness of VT interaction (Augustsson, 2010; Khurana, 2016; Lambeth, 2011; Salas, 2014). Some recommendations in previous studies include setting clear expectations (with a rubric provided) and connecting student participation in online discussion and

peer feedback exchange to better learning outcomes (Khurana, 2016). For instance, Khurana (2016) asked students to comment on each other's assignment drafts for improvement and revision before a more refined version is submitted. This can be applied to individual assignments as well as group project work (e.g., group videos in Lambeth, 2011). Such empirical studies provide best practices for course developers keen on incorporating VT in their online programs.

Despite VT's versatility and functionality, research on the impact of VT multimodality on online learning outcomes and stakeholder experiences is less explored in Australia's distance education. Wan and Howard (2015) investigated the way VT was utilised to teach resilience to pre-service teachers in their Graduate Diploma course in Australia. In that course, VT served as a supplementary tool for students to share their digital stories on resilience in addition to face-to-face instruction. VT was utilised because it allowed for multimodal comments and feedback using videos, audios or images, was safe (password-protected), and fostered the "community of practice" (p. 748). Nevertheless, the main focus of Wan and Howard's (2015) study was the use of digital stories and the content of those stories reflecting students' views on resilience. More research is needed on whether the use of VT can make a difference in online engagement and learning outcomes (when compared to its DB counterpart) and how VT affordances play out in distance education, particularly in OUA.

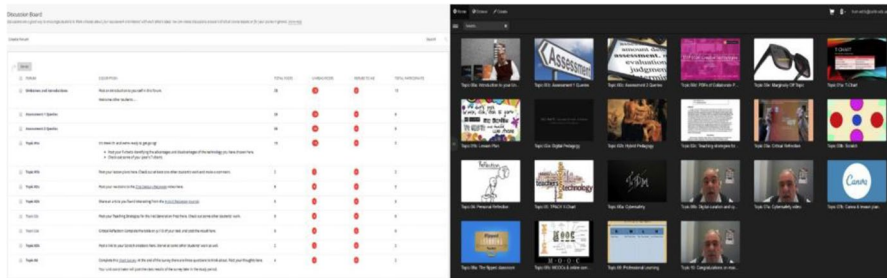
Worth noting is that instructors' experiences with VT as an alternative discussion space are also under-researched (Delmas, 2017, p. 599). This gap is particularly conspicuous in light of the theoretical frameworks commonly applied to the evaluation of online engagement such as the Community of Inquiry (CoI), where social, cognitive, and teaching presences are intertwined for the successful course design (e.g., see Garrison, 2013; Majeski et al., 2018). These observed issues propelled us to investigate the effectiveness of VT as a potential online discussion platform during an online lecturer's debut with VT in one of his OUA units. Students' and lecturer's feedback about their experiences and perspectives were collected and thematically analysed. Lessons learned from this innovative implementation can offer instructors, students, and programs best practices to promote online engagement and retention in adult distance education.

### 3 The study

#### 3.1 Setting

The study was part of a larger project piloting the feasibility of VT for asynchronous online discussions in lieu of DB. It aimed to examine the challenges and usefulness of VT perceived by both the OUA students and lecturer. One of the project team members (also an OUA lecturer) was the coordinator of the unit *Creative Technologies*. Ethical clearance for the project was obtained prior to the commencement of this OUA unit in 2018.

DB had been used as a discussion space for all the OUA and on-campus units by default. To test whether the use of VT could foster OUA students' online



**Fig. 1** DB (left) vs. VT interface (right)

engagement, his students were randomly assigned to two discussion groups in either DB or VT. All the weekly discussion topics were kept the same to both groups, except for the difference in the posting format (i.e., text-based DB posting vs. multimodal VT posting, see Fig. 1). As it was the first time both the OUA lecturer and students used VT as an alternative discussion platform, we aimed to investigate how this experience impacted their attitudes towards online discussion compared with that in DB. The findings would also inform the future decision making of the stakeholders (unit lecturers, course coordinators, Director of Teaching and Learning) on selecting a viable platform for online discussion.

## 3.2 Data collection and analysis

### 3.2.1 Online survey

At the end of the unit, the students were invited to respond to an online survey on their experiences with the use of the discussion space to which they were assigned (i.e., DB or VT). The survey consisted of three parts: *demographic information about the students*, *closed* and *open-ended questions*. When designing the closed questions (Part 2 of the survey), we categorised the items into three levels: students' overall learning experience of each tool (coded as EX), their views about the technological aspects of each tool (coded as VT or DB), and affective factors triggered by each tool influencing online community building (coded as AF). Each code (construct) also lent itself to multi-item scales drawing upon different dimensions of the same construct. It is to avoid the pitfalls of relying solely on single-item scales that might have weakened the validity due to participants' response errors or one single item failing to capture different aspects of a construct (Dornyei & Csizer, 2012). Item wording was also kept comparable for both surveyed groups. Part 3 (open-ended questions) prompted participants to elaborate more on their responses in Part 2, while tapping into the same three constructs (EX, VT or DB, AF) and focusing on the comparisons of the two discussion tools (see Appendix 1). It was developed based on the discussion forum attitude survey items used in Green (2013) and Wah and Ngoh (2005).

Out of 96 students who completed this unit, 31 responses were received with a 32% return rate – 20 from the DB group and 11 from the VT group. Of the students who participated in the survey, seven were males and 24 females. The students were studying a postgraduate degree in Education across areas of Early Childhood, Primary, and Secondary Education. Six students were in their second year of the Master's course, while 25 were in their first year.

### 3.2.2 Teaching log and follow-up interview

For the duration of the unit, the lecturer kept a teaching log documenting his ongoing observations and experiences of the VT trial. Upon unit completion, he further reflected on this whole experience and compared the technical and instructional aspects of the two different platforms in a follow-up interview with one of the authors.

### 3.2.3 Analysis

The students' survey responses and the lecturer's critical reflection kept in his teaching log and provided in the interview were cross-examined and thematically analysed. The results were then compared to findings drawn from related studies, followed by discussion on pedagogical implications for online teaching and learning, course design, and future research.

## 4 Findings

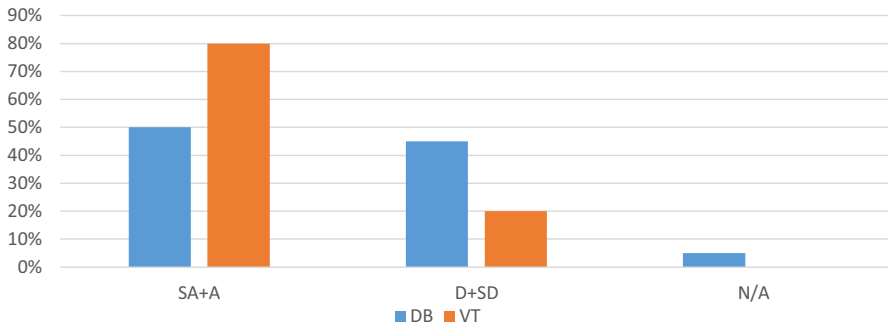
Both students and the lecturer evaluated their experiences in terms of the benefits of the use of DB and VT as well as challenges they faced. Student insights and suggestions are presented below regarding the perceived impact of the discussion platform on learning experiences, use of the interface and multimedia elements, and engagement with others in the unit. This is cross-referenced with the lecturer's reported experiences throughout the section.

### 4.1 Learning experiences (EX)

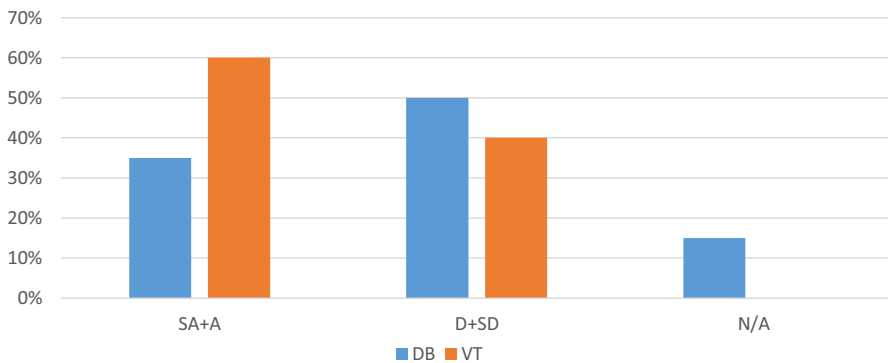
Regarding their learning experience with the discussion space, the students were asked in the survey if they "*felt that [they] learned a lot through online discussion*". In DB, agreement<sup>1</sup> and disagreement were almost equal (50% vs. 45%), whereas four times more students agreed than disagreed in VT (80% vs 20%) – see Fig. 2.

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<sup>1</sup> For the sake of data summary, agreement presented onwards will indicate the percentages of Strongly Agree (SA) and Agree (A) combined, and disagreement – Disagree (D) and Strongly Disagree (SD) combined, unless stated otherwise. N/A refers to "not applicable".



**Fig. 2** Student responses to the item “*I felt that I learned a lot through online discussion*”

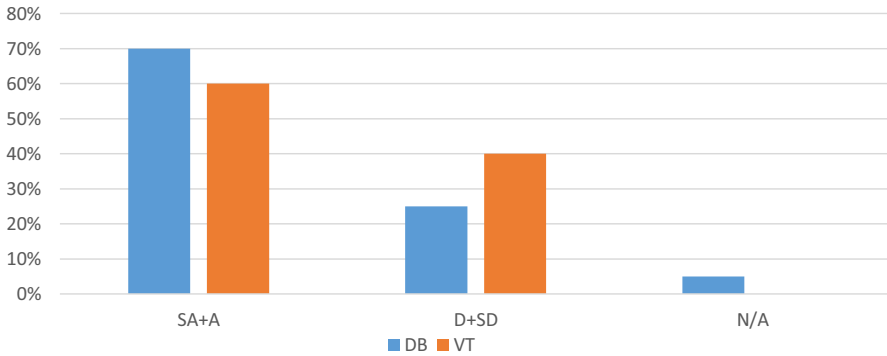


**Fig. 3** Student responses to the item “*I enjoyed participating in on-line discussion*”

Students were also asked if they “*enjoyed participating in online discussion*”. Figure 3 shows that agreement in VT was almost twice as that in DB (60% and 35% respectively). This may indicate that, while students in DB and VT groups felt both discussion platforms generally benefited their learning experiences, students tended to value the input from VT more than that of DB.

The open-ended survey responses shed light on the marked differences. DB was considered by the students to poorly reflect face-to-face communication in a physical class: “*Not really as interactive and as immersive as face to face discussion.*” In particular, there was “*no instant feedback or none at all*”. In addition, the editing function was not available for student posts on DB. This created a feeling of “*not being confident to put forward your answers or opinion*” in a virtual public space. Overall, these drawbacks may have inhibited further elaboration, making online discussion less critical and less stimulating.

The majority in both groups, 75% in DB and 80% in VT, agreed that “*the information posted by other students was useful and relevant*”. Similarly, approximately two-thirds in both groups found that “*answering questions and responding to other students helped [them] to understand concepts and topics in the unit*”. Open-ended



**Fig. 4** Student responses to the item “I often read discussion postings but did not respond to them”

survey responses indicate that posting by other students provided guidance and direction that was helpful for their studies and motivated them. In fact, finding information, and in particular, having an opportunity to ask questions or read answers was the most commonly mentioned strength of DB. It helped DB students feel more comfortable knowing they were not the only ones having these questions, whereas it prompted VT students to engage more in the discussion.

While asking questions was perceived as beneficial for generating information, 80% of the respondents in both groups agreed that they “*found reading other peoples’ posts more useful than asking questions*”, and 70% of DB and 60% of VT respondents indicated that they “*often read discussion postings but did not respond to them*” (Fig. 4). One DB student explained: “*Viewing other students reactions to readings is the most valuable to me,*” in line with another student’s comment that it “*helps to read other peoples stuff/ideas.*” While VT students did not elaborate about reading posts by others, it is clear from the item responses that this trend is leaking into the multimodal platforms.

As the first-time VT user, the lecturer candidly reported that he initially did not expect much from this trial. However, as the unit progressed, he noticed a marked difference in the level of task engagement and retention of online discussion. From the perspective of an instructor and course designer, he found setting up the VT interface motivated him to rethink how to make online discussion more interesting and engaging:

... it was not that the DB is lacking (in that you can still link to media etc. as stimuli) but rather that the VT system ‘forced’ me to present the questions and discussions in the unit in a different way...

In particular, the lecturer “*appreciated that the stimulus [discussion prompt] and the responses are together in the same place in VT*”, which is different from DB when question prompts are usually posted within the topic folders outside of the DB interface. The streamlined layout of VT was perceived to have “*made VT feel more integrated into the unit*” and hence facilitate discussion. In addition, when the lecturer initially set up weekly topic discussions in VT, this alternative to conventional



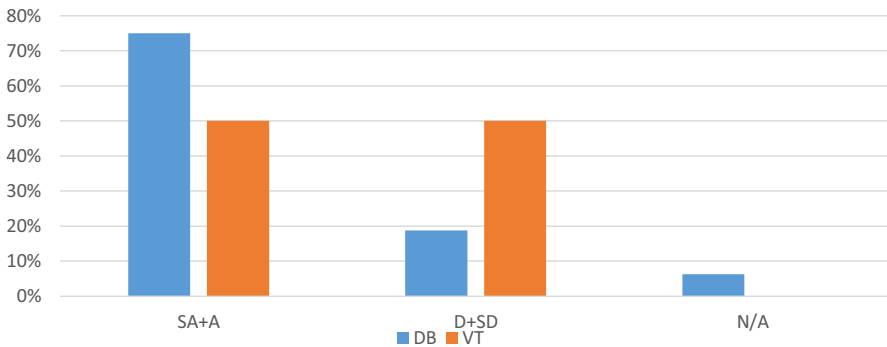
DB ‘challenged’ him to “*try to find interesting stimulus material [e.g., a video, image]*” and put it “*in a more interesting form instead of just saying, what do you think about the use of technology in education?*” As such, this trial intellectually challenged him to adjust his teaching approaches outside the DB box, thus helping improve students’ online learning experiences from the start.

## 4.2 DB/VT functionality

Both student groups also responded to the items on the functionality of each platform. Interestingly, almost half (45%) of the DB respondents agreed that “*the multimedia elements ... enhanced online discussion*”. Given the nature of the unit, students included links to their media creations, although those external links would direct viewers away from DB rather than display the created media within DB itself. One student elaborated on this aspect, “*Yes, hearing/ seeing/ reading other people’s discoveries and concepts led to a new level of interest and thus engagement*”. This indicates that even though DB is a text-based platform, students do appreciate having more opportunities to engage with the multimedia content or display.

While multimedia functionality is the hallmark of VT, there was an equal allocation (50%) of agreement and disagreement amongst students on the same item. On one hand, VT afforded and streamlined multimodal communication: “*[in VT you] can post media elements easily*” and “*I liked listening to people’s recordings rather than reading long typed responses*”. This functionality also made VT discussion more collegial and approximating in-class experiences: “*It seems to humanize your peers more th[a]n an email or other written communication*”, “*I love the video and audio aspect because I found it more engaging. I much prefer face to face or voice communication.*” Despite the potential benefits, the use of media on VT was also a double-edged sword for some students because “*... you had to listen to posts rather than be able to skim read them to see if they had any relevance*” or “*I didn’t have the time to work out how to record myself so I just typed my responses*”. “*The potential to ‘ramble’ when talking*” in audio posting also took more time to both record and listen to the posts. Similarly, the lecturer found it harder to navigate through VT: “*The ‘timeline’ approach was good but at times I found the interface to be difficult in terms of being sure that I had seen/heard all contributions....*”.

Among the multimodal types, 90% of the VT respondents appreciated the use of audio recordings and images, followed by video postings with an agreement equally distributed at 50%. For students who are not tech savvy, multimodal features can trigger additional challenges: “*It requires learners to be tech savvy and patient with technology. It requires computer compatibility particularly when signing in*”; another student also mentioned that the group had participants of “*varying digital fluencies*”. In addition, voice and video recording can be daunting for some: “*some people feel shy speaking*” and “*its confronting in the same way public speaking is*”. This may have been one of the reasons why some VT students preferred to default to text postings or limit their engagement to reading/listening/watching the posts of others (as indicated in the section above).

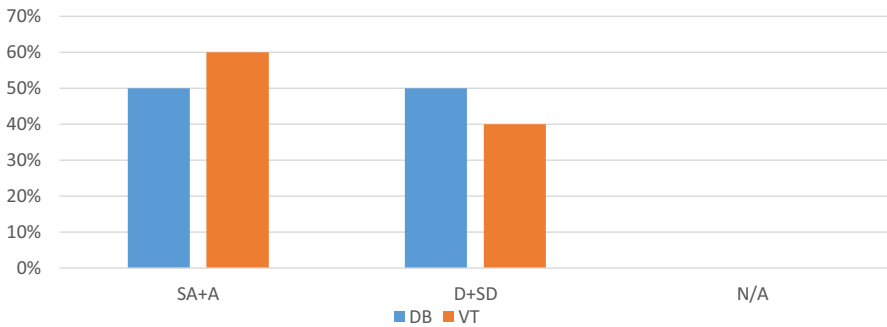


**Fig. 5** Student responses to the item “I felt posting in DB/VT was time-consuming”

This challenge is also reflected in student responses to “posting in discussion board/VoiceThread was time-consuming”, with 75% and 50% agreement in DB and VT respectively (Fig. 5). In particular, the DB interface was described as a “format [that] is not user friendly” with “lots of posts there, [in] the format [that] can get hard to read” or simply “too many threads”, leading to students “clicking through a multitude of responses”. This made DB look “clunky”, “confusing and annoying”, and “messy”. A few DB students commented that there was “too much to read”. A couple of students admitted that once they lagged behind readings and assignments as the weeks went by, they had no time to participate. In addition, absence of notifications in DB made it “easy to miss things or forget about the discussion board” as one needed to log in in order to check if any new posts were made: “You have to check often, there are no notifications when things are posted”. This added to the study workloads of students who also had other real-life commitments to juggle: “In my own situation as a single mum studying full-time I found it a little too taxing of time”.

It should be noted that some VT students also found it more cumbersome to use: “a somewhat clunky system,” and “time consuming”. The unfamiliarity with VT may have turned some students off. Given its novelty, students asked for more initial preparation/training: “perhaps more of any introduction to the program”.

Inevitably, the lecturer also found his trial with VT more time consuming to set it up and slightly difficult to adjust from the DB mindset to the VT multimodal configuration: “At first ... I had not understood (or instructed students) how to add new pages to a thread (which avoids the thread becoming one very long string of posts).” He also mentioned that this might have initially challenged some students’ willingness to participate in VT discussions: “I am afraid that some students may have hit this barrier in the early part of the semester and never had the confidence to rejoin”, though he also admitted that clearer instructions provided at the outset could help those students ease into the VT platform. For the first-time users, he recommended creating a trial VT thread in the orientation week to enable both the lecturer and students to explore its functions and address questions. He also suggested making



**Fig. 6** Student responses to the item “I think that posting on DB/VT should be a regular unit activity”

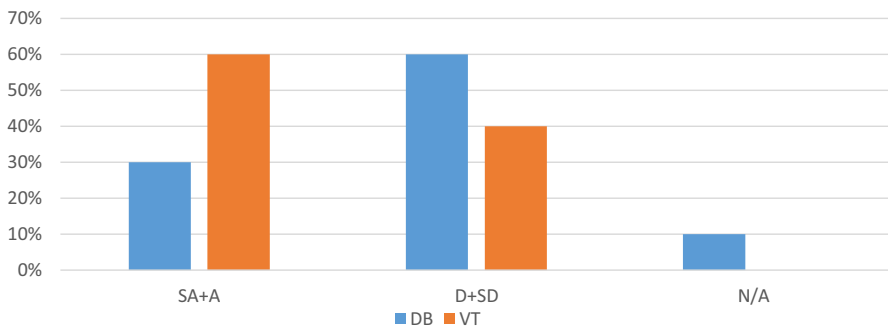
instructor tutorials on how to use VT step by step, which can be done via screencasts and uploaded as video posts within the VT platform.

Overall, student responses to the item, “I found using discussion boards/VT challenging”, showed 45% and 40% agreements in DB and VT respectively, corroborating these findings. The item “I think that posting on a DB/VT should be a regular unit activity” had students divided: 50% vs. 50% in DB and 60% vs. 40% in VT (Fig. 6). These results indicate that providing online discussion spaces or making multimodal postings available does not guarantee successful online community building and positive learning experiences. Well-established training workshops and ongoing debriefing sessions to address challenges such as time management should be factored into online unit design to maximise the outcomes.

### 4.3 Affective factors (AF) for communication and engagement

An online discussion space was perceived an effective way of communication by both student groups. 75% of respondents agreed that DB is “an effective tool to communicate with other students” and “for the lecturer to communicate with students”. VT group demonstrated even higher agreements of 90% and 80% in the same items. Notwithstanding, the two student groups responded differently to the items related to their own online engagement (Fig. 7). Only 30% of the respondents from the DB group felt “more engaged when using discussion boards for online tasks and projects”, whereas VT agreement was twice as high at 60%. Similarly, only 40% of DB group agreed that “using discussion board made [them] more connected to [their] peers and tutors”, compared to 70% in VT.

Students’ responses to the open-ended survey items help understand the reasons behind these figures. They referred to DB as a disorganised space and not conducive to engagement. This echoes the findings presented above that DB communication operated in dangling threads demotivates online discussion in a short and tedious fashion: “The way the Blackboard DB is structured is completely counter to producing engagement on interaction... every one just starts another new topic and as a result you’re left with a million different threads with very little or no interaction.”

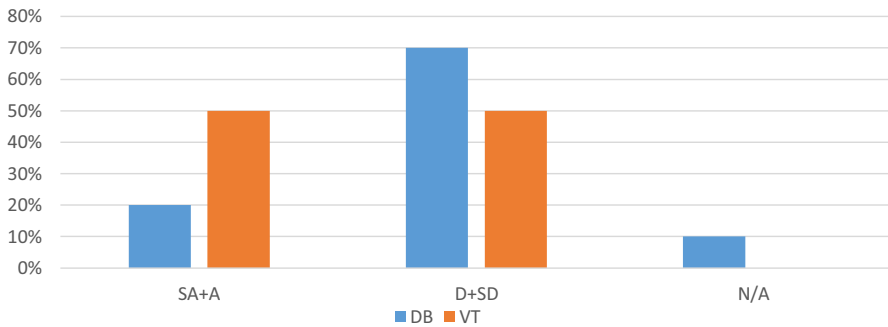


**Fig. 7** Student responses to the item “I felt more engaged when using DB/VT for online tasks and projects”

This critical evaluation of why DB does online engagement a disservice is also seconded by other DB students: “Once students realise that there is no interaction on the Discussion Board it’s like a snowball effect, no one comes back and it turns into a Ghost Town” or “answering set questions, unless they are carefully crafted doesn’t engage me”. They also indicated that the information provided on DB, in particular tutor’s responses, could be found elsewhere. Hence, there is no leverage to stimulate further engagement.

Students also mentioned that the linear, text-based, one-dimensional setup makes DB threads and posts appear impersonal. In particular, DB was lacking paralinguistic features as in F2F communication, making students “unable to gauge tone, emotion etc.” One student explained: “I personally feel disconnected as I do not actually ‘know’ anyone i’m studying [with]”. It was also pointed out that given online discussion was not compulsory and grades are not allotted to it, fewer people engaged, leading to less interaction. Further, there is a delay in DB responses: as in “far too asynchronous ... to get involved”. As a result, DB was perceived as not as interactive and intuitive as other social networking tools such as Facebook.

In contrast, VT students “felt more involved in the discussion” due to a more engaging and streamlined interface that mimics a social networking vibe: “All the unit’s content/activities were in one location”, “Easily accessible, interact with many students and lecturers”, “It is very engaging to both learners and teachers”. VT was also seen as more reflective of real-life interaction: “A good platform to join in to make online learning almost real and face to face”, “i really felt as if i had met my tutor in real life”, and “It was nice to see my peers and tutor in person in the recording and to hear their voices. It did make it more personal and did help me to feel more connected.” This made VT a “more inclusive and comprehensive” platform that “adds that physical person and creates a sense of a support network”. From the online teaching perspective, the lecturer also observed the difference in student participation: “certainly students that responded with audio/video contributed much more than those that responded with text only or just posted documents.” He specified that they “revealed more personal details relating to their work and reasons for study”, which in turn “helped direct the information [he] was giving”.



**Fig. 8** Student responses to the item “*I enjoyed investing more time to interact with peers via DB/VT*”

In addition, VT provided opportunities for both the lecturer and his students to grow professionally. One student mentioned feeling “*confident*” and explained: “*I was conscious at first but realised as a teacher I need to feel happy to use the audio and video options.*” The lecturer reflected on how trialling this discussion space encouraged him to be more innovative in the way he approached online discussions in all his OUA units, including those in DB.

The students were also asked whether they “*enjoyed investing time to interact with peers via DB/VT*”. In response to this item, only 20% of DB respondents agreed, compared to a strikingly higher agreement of 50% in the VT group (Fig. 8). While both platforms were found time consuming as presented above, the marked difference in this item aligns more with the higher level of online engagement triggered by VT. 50% of disagreement among VT participants, on the other hand, may be partially attributed to the overall time-consuming nature of learning a new tool.

The lecturer noticed that the strong bond developed by the VT group fed into a heightened level of discussion exchanges, as opposed to one-off posting/responding more commonly observed in DB: “*The strength of the VT system is that relationships develop between users that post with audio/video that only rarely occur in the DB (in my experience).*” Interestingly, the lecturer also found himself drawn more to the VT group as he would frequently check the posts and attribute the stronger sense of tele/copresence to audio-/video-based posting: “*Because of these relationships I tended to check VT more frequently and respond in a fuller manner.*” He specified that it enabled “*seeing people’s faces and knowing and quickly being able to identify who’s posted, because ... you feel you know that person, but on the discussion board you never really feel like you know them.*” Reflecting on the use of this multimodal discussion tool with a larger group, he suggested that “*I don’t know how it would go with a really large group. You know like a unit with five or six hundred students... You might have to create sub-groups.*” This suggestion, though geared towards the VT discussion arrangement, would be also applicable to DB when dealing with a larger class size.

## 5 Discussion and implications

The findings of this study contribute to the body of knowledge about the stakeholder experiences with digital discussion platforms and how these relate to engagement and community building in collaborative online learning environments. The study revealed that in both text-based and multimodal platforms, OUA students appreciate the opportunity to interact with others and perceive asking questions, reading responses, and developing personal connections to be beneficial for their online learning experiences and engagement. This supports our findings from another part of this project, based on the analysis of the student postings, that asking questions and sharing experiences are conducive to the establishment of the online community in both platforms (Chen & Bogachenko, 2022). Interestingly, while DB students mentioned connectedness, creation of a community, sharing information and receiving advice as important elements of their online study, they didn't rate DB high in this regard. This implies that as much as students value these experiences in an online space, the interface and functionality of a discussion platform would also influence their perceptions about this aspect of their learning environment.

Similar to the findings from previous studies (Ching & Hsu, 2013; Delmas, 2017; Donnelly et al., 2016; Fox, 2017; Khurana, 2016; Sato et al., 2017), the use of multimodal features, as evidenced in the VT group, results in increased student engagement with the content materials, connection with each other and the instructor, and enjoyment of their online learning experiences. For instance, a streamlined interface (where prompts and responses are displayed in the same place) seems to have brought members of this unit closer, thereby establishing a stronger online community of practice (Chen & Dobinson, 2020; Chen et al., 2020a, b). Further, in line with teachers' practices reported in Ice et al. (2007, as cited in deNoyelles et al., 2014, p. 161), audio recording of the oral feedback (rather than typing) was seen by the lecturer as more time-efficient, enabling him to provide more feedback to the students. Echoing Sala's (2014) research where instructors perceived the use of audio and video in VT more humanising, our study also found these features allow the lecturer to develop stronger rapport with the students and navigate the discussions more easily when "*seeing people's faces*."

Therefore, VT discussions were shaping and shaped by the co-construction of meaningful engagement and knowledge exchange between and among the online community members of this OUA unit. Trialling VT encouraged the lecturer to reinvigorate his unit and seek more creative ways to orchestrate OUA unit materials and discussions, a response to the VT trial that had not been documented before. Overall, these findings support the positive claims made by previous research that adopted a social constructivist approach to VT communication (e.g., Khurana 2016) and reported perceptions of VT as a supportive online learning environment (see Dalat-Ward et al., 2019). This has important implications for online course designers in distance education who are required to create collaborative learning environments to make both students and instructors feel supported and engaged.

Despite these perceived benefits of multimodal online discussion, challenges facing the stakeholders and strategies to tackle those issues are also noted in this study. The major downfall of DB seems to be the structure of its multi-layered linear threads that makes it harder to follow the updates, whereas the innovative multimedia affordances of VT may seem daunting to some newbies. Students in our study held three different levels of attitudes towards VT as an online learning environment: some felt more engaged due to multimodal postings that made interaction more personalised; others experienced no difference from DB especially if they only favoured typing; yet others did not engage due to the use of VT being too time-consuming, them being too shy to audio/videorecord themselves in postings, or facing technological difficulties. The lecturer's and students' experiences mirrored some of the previously reported challenges such as VT setup being more cumbersome (Chan & Pallapu, 2012; Ching & Hsu, 2013; Shultz et al., 2014), technical issues (Delmas, 2017), and unfamiliarity with navigation (Chan & Pallapu, 2012; Ching & Hsu, 2013; Fox, 2017). These aspects were found to have an impact on the lecturer's practices of both setting up and teaching the unit, including his ability to track students' activity and ensure their engagement with the unit. They also kept students from utilising VT to its full potential, with the majority of the group opting for reading, listening to, or watching the posts of others rather than contributing themselves. This explains why a smaller percentage of students in the VT group than DB participated in online discussion (see Chen et al., 2020c). At the same time, it is suggested in the literature that in innovative online learning environments, students regularly face technology-related challenges and so may become accustomed to problem-solving (e.g., Mejia, 2020).

The findings also implicate how these challenges can be overcome. Modelling of VT use in the form of video tutorials, as suggested in previous studies (Beach & O'Brien, 2015; Khurana, 2016; Shultz et al., 2014), was perceived by our lecturer and students as a viable way to assist the uptake of this multimodal tool. Adding to the existing scholarship, equally pedagogically sound is to create a "trial thread" for both the instructor and students to have a go and try different VT modes and functions before and during the semester. These are some practical ways to address the need to prepare students for such innovative learning environments indicated in current literature (e.g., Vahed, 2021). Another novel suggestion is that, given the dynamics and practicality of online interaction, a larger online unit should be divided into smaller groups when VT is implemented as an alternative discussion platform. Finally, heralding the potential value of learning new digital tools as a part of professional development can also motivate online teachers and students to overcome challenges in experimenting with these tools, particularly in units related to educational technology. This can make a positive difference in their online engagement and, as a result, promote a virtual community of practice in such learning environments (Sadera et al., 2009).

## 6 Conclusion

Taken together, stakeholder feedback provides like-minded instructional designers and online educators with insightful information about how VT can bolster online discussion and student engagement beyond the conventional DB space. While students in both groups acknowledged the value of communication in distance learning environments, the VT group demonstrated higher levels of engagement and enjoyment with VT as an alternative discussion platform. In line with previous research into online student experiences with VT, being able to hear everyone's voice and see his/her face promoted a stronger sense of tele/copresence, thereby shortening the virtual distance usually experienced by online students. Although designing a VT-enhanced learning environment might seem more time-consuming and technically-demanding than text-based DB, the lecturer and his students found it a rewarding experience in seeing higher motivation and creativity with the unit development and online interactions. Due to the small scale of this pilot study, stakeholders' co-construction of the unit through enhanced engagement needs to be further investigated. Involving participants with prior VT experience can also help eliminate the novice-related challenges and focus on the actual learning and teaching outcomes as a result of this multimodal alternative.

Importantly, it is evident from the findings that potential challenges related to the functionality and effectiveness of the interface need to be addressed. Providing tailor-made training to both students and lecturers is suggested to help increase confidence in using different modes of posting more effectively, thus boosting engagement and enjoyment of students' online learning experiences. Overall, this VT trial implicates that creating a multimodal discussion space has a capacity to reinvigorate and reshape conventional approaches to discussion in online learning environments.



## Appendix 1. Survey questions<sup>2</sup>

### Part 1: Participant information:

- Gender  Female  Male  Other
- What is your academic status?  First Year Student  Second Year Student  Third Year Student  Fourth Year Student  Post-Graduate Student
- What is your area of study?  Primary Education  Secondary Education  Early Childhood Education  TESOL  Other (please specify \_\_\_\_\_)
- Have you used discussion boards/VT in your other online unit(s) before MTPS504?  Yes  No
- If so, what is the name of the online unit(s) that also used discussion board/VT? \_\_\_\_\_
- Briefly describe how it was used. \_\_\_\_\_
- What were the other digital tools used in your previous online unit(s) delivered via Blackboard? Announcement  Class Blog  iLecture  Youtube  Collaborate  Other (Please specify \_\_\_\_\_)
- How often did you use discussion board/VT in MTPS504?  
Usually  Often  Sometimes  Rarely  Never   
Explain \_\_\_\_\_

### Part 2. Closed Questions:

	Strongly disagree	Disagree	Agree	Strongly Agree	Not applicable
	1	2	3	4	NA
EX 1	I felt that I learned a lot through online discussion				1 2 3 4 NA
EX 2	I enjoyed participating in on-line discussion				1 2 3 4 NA
EX 3	The information posted by other students was useful and relevant				1 2 3 4 NA
EX 4	My tutor posted useful and relevant information				1 2 3 4 NA
EX 5	I found that posting ideas and questions helped me to learn				1 2 3 4 NA
EX 6	I found that answering questions and responding to other students helped me to understand concepts and topics in the unit				1 2 3 4 NA
EX 7	I found reading other peoples' posts more useful than asking questions				1 2 3 4 NA
DB/VT 1	I found the multimedia elements in discussion boards/of VoiceThread enhanced online discussion				1 2 3 4 NA
DB/VT 2	I found the use of video (elements) in discussion boards/ VoiceThread enhanced online discussion				1 2 3 4 NA
DB/VT 3	I found the use of audio (elements) in discussion boards/VoiceThread enhanced online discussion				1 2 3 4 NA
DB/VT 4	I found the use of images in discussion boards enhanced online discussion				1 2 3 4 NA
DB/VT 5	I often read discussion board/VoiceThread postings but did not respond to them				1 2 3 4 NA
DB/VT 6	I found using discussion board/VoiceThread challenging				1 2 3 4 NA
DB/VT 7	I felt the use of a discussion board/VoiceThread was essential to my online learning				1 2 3 4 NA
DB/VT 8	I think that posting on a discussion board/VoiceThread should be a regular unit activity				1 2 3 4 NA
DB/VT 9	Discussion board/VoiceThread is an effective tool to communicate information to peers and teachers				1 2 3 4 NA
DB/VT 10	Discussion board/VoiceThread is an effective tool for teachers to communicate information to students				1 2 3 4 NA
AF 1	I felt more engaged when using discussion board/VoiceThread for online tasks and projects				1 2 3 4 NA
AF 2	I enjoyed investing time to interact with peers via discussion board/VoiceThread				1 2 3 4 NA
AF 3	I felt posting in discussion board/VoiceThread was time-consuming				1 2 3 4 NA
AF 4	I felt using discussion board/VoiceThread made me more connected to my peers and tutors				1 2 3 4 NA
AF 5	I felt more motivated in my unit due to the use of the discussion board/VoiceThread than without using it				1 2 3 4 NA

### Part 3: Open-ended Questions:

1. What are the advantages of using discussion board/VoiceThread for online learning?
2. What are the drawbacks of using discussion board/VoiceThread for online learning?
3. Did you feel more engaged when participating in online discussion board/VoiceThread than discussion board? Why or why not?
4. Did you feel that you invested more time in online activities when discussion board was used/ via VoiceThread than discussion board? Why or why not?
5. How did you find using discussion board allowed you to connect with your peers and tutor?/ How did you feel about using VoiceThread to connect with your peers and tutor vs. using Discussion Board? Please explain.
6. Overall, how would you rate your experience of using discussion boards for online units/ how would you compare your experience of using VoiceThread for online discussion to your prior experience of using Discussion Board?
7. Do you have any suggestions or comments about using discussion board/VoiceThread for online OUA units so that future students can benefit from your input?

<sup>2</sup> Items included in discussions board /VoiceThread versions are provided with a slash.

**Abbreviations** CoI: Community of Inquiry; DB: Discussion Board; OUA: Open Universities Australia; VT: VoiceThread

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## Declarations

**Competing interests** The authors declare that they have no competing interests.

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