Student experiences of facilitated asynchronous online discussion boards: Lessons learned and implications for teaching practice

Allison J. James
University of Tasmania, Australia, a.james@amc.edu.au

Tracy A. Douglas
University of Tasmania, Australia, t.douglas@utas.edu.au

Louise A. Earwaker
University of Tasmania, Australia, louise.earwaker@utas.edu.au

Carey A. Mather
University of Tasmania, Australia, Carey.Mather@utas.edu.au

Follow this and additional works at: https://ro.uow.edu.au/jutlp

Recommended Citation

Student experiences of facilitated asynchronous online discussion boards: Lessons learned and implications for teaching practice

Abstract

As an alliance of academics undertaking blended delivery, we have experienced the challenge of tailoring teaching strategies to different learning styles. Our teaching has evolved, moving from traditional didactic delivery to the utilisation of online technology to accommodate both academic and student expectations. The pressure to teach within constrained resources and issues presented from the COVID-19 pandemic has provided opportunities to optimise educational technology. We identified a gap in genuinely engaged online discussions, observing that pedagogic value was often obscure. This cross-sectional study investigated the opinions and experiences of undergraduate students in four health science online units where asynchronous discussion boards were linked to summative assessment. By assessing discussion posts, students may be motivated to participate further, with student engagement influenced through educator involvement, the discussion purpose and group interactivity. Whilst some students were critical of the value of asynchronous discussion boards, others positively viewed discussions as a platform for peer engagement and information sharing. Discussion boards can provide active learning experiences particularly for online students; however, effective educator involvement and online supportive teaching strategies and practices are crucial to pedagogical success. Based on the key findings from this study we propose implications for practice in a higher education context.

Practitioner Notes

1. Students provide valuable and insightful opinions regarding their discussion board experiences to be harnessed to improve higher education online learning and teaching practices.
2. Post COVID-19, the need for coherent interfaces to deliver and impact upon positive student experiences and effective interactive dialogue is essential.
3. Discussion board designers should consider the fit between unit learning outcomes and capability of students and educators to use technology interfaces to enhance student engagement.
4. The role and influence of educators has a positive impact on student learning, perceptions of their experience and work readiness.
5. Where student cohorts are diverse, representing different cultures, religions, nationalities and linguistic backgrounds, both educators and students should empathise with and venerate other learners.

Keywords

Asynchronous facilitated discussion, COVID-19 pandemic, blended learning, work readiness, student engagement.

Introduction

Higher education (HE) has seen a progressive increase in literature investigating pedagogical use of asynchronous online discussion boards (hereafter *discussion boards)* and facilitated online discussion boards. The COVID-19 pandemic (hereafter *the pandemic)* has accelerated the need to utilise educational technology effectively. As we move into the third year living with the pandemic, people are craving the needs of connection, purpose, focus and hope (Kinash 2021). Online discussion presents opportunities for addressing these demands. As educators, we prepare our discussion boards with forethought and planning. However, effectiveness is still often elusive (Douglas et al., 2020b). Kinash (2021, p. 9) presents student engagement as the threshold for learning, stating: "engagement requires reciprocal connection and means both that students are fully present in the university experience and compelled to contribute to communities within and beyond". Similarly, Valenti et al. (2019) found that, within remote asynchronous contexts of online teaching, not all experiences, including those involving discussion boards, are effective in engaging students. The implications for practice are a fit between unit (subject) and course (degree) learning outcomes and the ability for educators to have a positive influence on desired pedagogical results, including student engagement, and learning outcomes. This research focussed on the benefits and challenges experienced by students during an academic semester. From the lessons learned, implications for teaching practices are made for improving teaching by moving toward higher student engagement and enhancing deeper disciplinary understanding.

Within our online learning environments, we challenge our students to contribute through online discussion, thereby enhancing knowledge acquisition and influencing professional learning. As practitioners, we have experienced gaps in understanding what is needed to develop a positive facilitated and assessed online discussion experience relevant to the international digital world.

We explored student perceptions via an anonymous online survey to discern a comprehensive understanding of factors which motivated students to engage and their overall experience as online learners. We used open ended and reflective questions to generate qualitative, descriptive data on their experiences. Student perceptions of the value and influence of facilitated online discussion on student learning, to identify characteristics that support teaching practice were also investigated. The aim of this study was to explore current literature on the impact and student perceptions of online facilitated discussions and provide suggestions to reduce the negative impacts of discussions through online-supportive practices.

The research questions to address the aims of this research were:

1. What are the challenges and issues experienced by our students during online discussion?
2. What are the positive learning practices and outcomes experienced by our students during online discussion?
3. How do students believe we can improve their online discussion board experience and outcomes?
4. From the literature, our experiences as educators and student perceptions, what are the implications for teaching practice to improve the student experience of online discussion?

Literature Review

Sankey (2022) discussed the state of Australasian online higher education post the COVID-19 pandemic and stressed that online teaching technology has been available for over 20 years. However, the pandemic has resulted in immediate challenges for most educational organisations

changing HE by halting face-to-face classes and super-speeding online learning and teaching (Douglas et al., 2020b). Langford and Damsa (2020) discussed the pandemic online teaching experiences and the acceleration of digital engagement for learning and teaching activities, estimating that such a transitional process would normally take 15 years. As we move beyond 2022, educational responses to the pandemic will continue to propel online learning and teaching, including the use of asynchronous discussion boards.

Online discussion boards: Current practice and environment

Educators generally seek out technology support from academic developers, educational designers and technologists to assist with the complexity of relationships between teaching and learning practices (Cowling 2022). Educators can be part of improving teaching practice to embrace technologies in the context of a global post-pandemic higher education sector.

Earlier studies have explored the perspectives of students and facilitators in discussion boards, and have related perceptions of satisfaction to one or more features of online discussion. These aspects include the structure of the forums, the level and type of interaction between educators and students and, the quality of discussion content (Ladyshewsky, 2013; Douglas et al., 2020b). Interactive discussion boards are important tools to foster student engagement. They enable student-student and student-teacher communication and collaboration, particularly if linked to assessment, and may promote development of critical thinking (Johnson & Johnson, 1986). Furthermore, effective social, teaching and cognitive presence promotes meaningful interactions in the online environment (Keengwe et al., 2013). This position is being questioned as more educators use discussion boards and debate the merits of assessing student participation along with the purpose of utilising discussion boards as part of their pedagogy. The pandemic has increased the uptake and stated purposes of discussion in HE units. Douglas et al. (2015) studied the question of whether to assess online discussions and found that engagement in discussion boards was influenced by several factors, particularly assessment. Assessing student discussions did motivate participation yet students may still engage in discussions simply to fulfil the assessment requirements and not enrich their learning. However, the value of interaction between students cannot be underestimated (Dennen, 2005).

Key researchers (Gregory, 2015; Da Silva, 2018) have reported discussion boards can be an effective learning tool for online students, with participation enhanced if online discussions are linked to assessment. Students tend to interact more in the first semester, diminishing as time passes and the most prominent reason to participate seems to exist when discussion boards are assessed (Gregory, 2015; Da Silva, 2018). The use of blended delivery modes including interactive discussion boards in online learning suggests such boards can be important tools to foster student engagement (Baldwin & Sabry, 2003). Investigation of online learning frequently centres on the usefulness of discussion boards since it is commonly a core component in online learning management design and course delivery as a key online communication tool (Hew et al., 2010). Collins et al. (2001) add motivation to the knowledge/learning/transfer paradigm and considered learners favour incentives for attending to relevant aspects of the situation and for responding appropriately.

In the discussion board environment, the role of online instructors is to enable peer interactivity and facilitate learning rather than the direct teaching of course materials (Thompson & Ku, 2006). Facilitation needs to be fit-for-purpose and ideally enable student-centred discussions rather than facilitator-centred discussions (Nickel, 2002). One response is to utilise student facilitation to enhance peer learning and student understanding (Seo, 2007; Gilbert & Dabbagh, 2005). If managed effectively by an instructor, peer facilitation can be successful (Ng et al.,

2012), as can instructor facilitation (Hew, 2015). However, both instructor and peer facilitation require strategies to enable active online discussion, depending on the learning context (Beaudin, 1999; Hew, 2015; Lang, 2000). For example, educators can enable knowledge construction by regularly posting to enhance student learning outcomes (Ghadirian & Ayub, 2017).

The asynchronous nature of discussion boards means online educators cannot tangibly visualise their students compared to face-to-face teaching. As such, it is challenging to identify which students are struggling and how to support them. Shaw (2019) suggested designing the course through scaffolding to meet diverse needs. Scaffolding is an instructional method that progressively moves students toward greater independence and understanding during the learning process.

To understand this concept, Shaw invites us to consider how a builder uses scaffolding to gain new heights by noting that instructional scaffolding helps students navigate coursework and accomplish tasks. Scaffolding is influenced by Vygotsky's (1978) concept of the zone of proximal development, based on three aspects of the learning process (Vygotsky, Cole et al, 1978). These are what the learner:

- Cannot do;
- Can do with assistance;
- Can do unaided.

Vygotsky considered scaffolding as the role of teachers and others in supporting the learner's development. Vygotsky's scaffolding is a teaching method that uses instructors and more advanced peers to help students learn. Raymond (2000) saw this as the learning students can be helped to achieve with competent assistance. Scaffolded instructions can minimize the level of frustration of the learner (Van der Stuyf, 2002).

Examples of scaffolds may include models, cues, prompts, hints, partial solutions and direct instruction (Hartman, 2002). Scaffolding means a process of setting up the learning situation to build up a student until he/she has adequate skills to manage independently (Boonmoh, A. & Jumpakate, 2019). Hence, facilitated online discussion can progressively move students toward greater independence and understanding.

Student perceptions and experiences of discussion board involvement and engagement

Discussion boards are often linked to assessment as a strong incentive for students to participate (Choi & Tsang, 2015). Pena-Shaff et al. (2005) reported student attitudes to online discussions alternated from enthusiastic to hostile; some students considered discussions as a chore lacking substance or meaning. These authors also reported that some students rebelled against the assessment incentive, which they viewed as burdensome, with some students exhibiting resentment at forced participation. A clear purpose of a discussion board is essential for student engagement (Gregory, 2015) with identifiable student outcomes (Steen, 2015).

Students' understanding of the purpose or the value of contributing online is a factor influencing satisfaction (Lee & Tsai, 2011). Hew et al. (2010) noted how discussion boards support active learning and higher-order thinking; however, they still reported that active engagement in online discussions is often minimal. Hew et al. (2010) reviewed 50 empirical studies and determined that one of the major reasons for narrow student contributions is not knowing the need for

discussions. Furthermore, whether postings were assessed or not, students valued a facilitator to direct the discussion.

Discussion boards provide a virtual site for student collaboration (Hall, 2015). Students perceive online discussions can provide valuable information, adapting to their needs and enhancing their learning (Christensen et al., 2018). Therefore, student disengagement with discussions boards may be related to facilitation (Northover, 2002; Ladyshewsky, 2013). Students respond well to facilitation of discussions and, as such, instructor facilitation energises learning quality and student satisfaction in an online course (Ladyshewsky, 2013). Disengagement may also be related to the ambiguous nature of discussion postings and the limited ability of students to construct knowledge through online discussion (Lander, 2014). The greater the level of student engagement, the higher the perceived value of asynchronous discussions (Northover, 2002; Pena-Shaff et al., 2005) and online collaboration is known to enhance academic performance (Kelly et al., 2010). Within an online classroom, thoughtful and personal discussions have also been shown to clearly enable deep learning and critical thinking through collaboration (Johnson, 2015).

One aspect of questioning effectiveness of online discussion is the reality that some students may simply read posts rather than actively participate. Dennen (2005) calls this behaviour 'lurking' and recognises that the student may have read and absorbed but not contributed to active discussion. Other educators (Tsiotakis & Jimoyiannis 2016) do not consider lurking as a lack of engagement. Researching student perceptions of online learning and discussion board assignments, Forman (2018, p. 14) found that interaction is "the most critical component" of successful online teaching, irrespective of the format in which interaction occurs. Student interactions are often essential to achieve positive learning outcomes (Ebrahimi et al., 2016; Tichavsky et al., 2015).

Badawy (2012) investigated student opinions of discussion boards to foster cooperation among students, and to answer their questions or concerns highlighting peer connections. In this study students commented that: "someone can post answers that are not perfect but still he/she knows better than I do"; and "in the boards, I ask general questions to draw from the knowledge of the entire class rather than focusing all questions to TA's (teaching assistants) and the professor" (Badawy, 2012, p. 5). These comments highlighted that key peer-peer communication and connections can develop within an online discussion board environment. Within remote asynchronous context, use of facilitators promotes student engagement, to draw out knowledge and understanding of issues relevant to learning outcomes and current industry practice (Douglas et al., 2020a).

Ghadirian and Ayub (2017) found that facilitating communication was fundamental for influencing participation. Their results suggested that students participate more with high quality facilitator contributions. The effectiveness of facilitation is professionally researched in certain areas such as teacher education (Ajayi, 2009; Biesenbach-Lucas, 2003; Lim & Cheah, 2003; Rodas, 2016). In a health context, the perspectives of facilitators and students as to the effectiveness of asynchronous online discussion boards are not as well known (Thomas, 2013), but recognised as important in interprofessional education (Evans et al., 2014; Hanna et al., 2013).

Douglas et al. (2015) demonstrated students required discussion posts that were engaging and fit-for-purpose, with facilitation enabling this activity to occur. A strategy for doing so is proposed by Gernsbacher (2016, p. 4), having hosted nearly 5000 online discussion forums, suggested facilitators need to prompt the discussion with action verbs such *as find, explain,* or *identify* and, that embedding preparatory links to each discussion forum deters *parachuting* into

the discussion. Discussion boards can be highly beneficial to teacher-student interactions. Martin (2014) found that educators utilising discussion boards estimate that their student interaction with students can be up to three times longer than with face-to-face students. It has also been found that facilitating discussions effectively while having the benefits of fostering both social and teacher presence, is time-intensive (Thomas & Thorpe, 2019) but does provide essential teacher-student connections to facilitate learning.

Student diversity and implications for the teaching context

Students attend university to learn their chosen career paths or develop and enhance their employability skills. Many of our students are already employed and can bring this experience to the discussion, which may assist those students who are school leavers, lacking substantial work experience. Therefore, education and educators must recognise the realities of working with, and embracing diversity. Diversity can also be appreciated in the changing holistic nature of students. Kinash (2021) recognises that students have more complex lives than previous generations, as current students are often simultaneously maintaining jobs, attending to families and have concerns over financial matters.

Reflecting on our research and development as educators, we value the rich diversity of our student cohorts. Online discussion brings together educators and learners with a vibrant resource of outlooks and experiences upon which to scaffold learning. Student and educator diversity enriches discussion and is pivotal to learning in the new technology driven space of curriculum delivery. Our rationale for undertaking this research is to assist an international audience to undertake effective online discussion. This is sharpened by how the pandemic has changed higher education by *super-speeding* online learning and teaching (Douglas et al., 2020), enabling a renewed, even nuanced focus to adapt to change and design, enabling, dynamic and fit-for-purpose discussion boards.

Methodology

The initial project team comprised staff members from different faculties and institutes of the university, each with an interest in improving teaching practice in an online environment. Most of the project team have worked at other Australian institutions and were able to bring individual and collective perspectives of up to thirty-two years of online teaching and learning.

This study was part of a larger research project, exploring the perspectives of students, educators and on-line facilitators regarding engagement in discussion boards. The larger study explored two principal areas: firstly, whether introducing facilitation and assessment in online discussions shaped student perceptions of satisfaction with, and level of participation in discussions; and secondly, what enhanced student learning and engagement from educators' perspectives. Our emphasis was on improving student learning whilst maximising outcomes of individual and collective teaching. Research ethics approval was obtained for this study (H0013544).

This study focussed on student opinions of the usefulness of discussion boards utilised as a key assessment item sociology or health science units (subjects). To gather primary data in a non-contrived setting, undergraduate students from one of four units were invited to participate by completing an anonymous online survey. Two units utilised discussion boards as an assessment task in the unit, (10% of the overall assessment was determined by discussion board participation), with clear assessment criteria (rubric) provided to the students. These two units adopted a mechanism of online discussion involving active participation of facilitators. Discussions were supported by narrated lectures, videos, along with required and optional

readings. This was implemented in response to negative student feedback on un-facilitated discussions, which were incorporated into the unit with no assessment weighting. It was hoped that the facilitated and assessed approach would engage student learning.

In the other two units, discussion boards were used as online communication tools for formative feedback purposes. Discussions also assisted students in other written assessment items in units.

The student cohort is a mixture of part-time and full-time students. The units are fully online or blended and offered to students studying mainly health-related courses (both undergraduate and post-vocational). Whilst most students are located on-campus some students (such as paramedics) are located throughout Australia in urban and rural locations, occasionally studying remotely. In addition, the paramedic students are often vocationally trained, mature aged students with diverse prior learning and life experiences, compared to the on-campus students who are mainly school leavers. This, along with typical cohort differences such as gender and ethnicity, may impact on the individual participation of students in online discussions. The students were diverse across the units, ranging from school leavers to experienced professionals, including national and international distance education and on-campus students representing a range of cultural experiences.

Respondents were recruited by email to participate in an anonymous online survey, with two reminders sent at two-week intervals. The authors designed the survey questions to elicit both quantitative and qualitative data. The first set of questions gathered information on the factors which motivated students to engage using online discussion boards and their overall experience as learners. The second group of questions were qualitative. This study focuses on the qualitative data collected. Questions were reflective and open-ended, designed to generate descriptive data on student experiences and asked about students' proficiency and how they used discussion boards for learning (Table 1). Two researchers coded responses independently (Braun & Clarke, 2006) and then cross-checked to ensure rigour. Themes emerged from the thematic analysis (Braun & Clarke, 2006).

Table 1

Reflective survey questions

Question
1. In your own words can you explain the purpose of being in a discussion group?
2. Which discussion did you find the most engaging? Please explain.
3. Which discussion did you find the least engaging? Please explain.
4. Please provide any feedback to improve the facilitation of online discussions.
5. If you have any other comments about online discussions, please provide them here.

Results

Participants reported a variety of experiences. Students surveyed were enrolled in an undergraduate health science or sociology unit where discussion boards were utilised as either

an assessment item (assessed) or a formative learning tool (non-assessed). Seventy-eight students completed the survey representing a conservative sample (15%) of the total cohort. We found the qualitative comments of those participating to be informative and insightful, therefore relevant for unit design and assessment strategies. Table 2 presents the themes gleaned from responses.

Table 2

Themes identified from student survey responses

Themes	Exemplars
Moderation to provide group etiquette boundaries for topics and minimise 'over-sharing' of personal information	Initially, I would say better moderation – so many posts are irrelevant or off topic
	Steer the topics and prevent students from discussing too many personal issues
	I found it frustrating when topics become based on personal experience rather than the perspective of the issue
	I would have participated more if the lecturer was involved to keep the content of discussions on the right track
Promote engagement: Common expectations Compulsory Assessed	I like the idea of everybody having to start a discussion and also having to reply
	Make them compulsory and you will see much more activity
	The compulsory discussion is the most engaging because everyone seems to participate
	Assessing posts would encourage students to participate, then they would learn how valuable posts can be
	By marking you got a higher quality response
Promote engagement by understanding different styles of learners	More moderation may scare people off who are posting
	Don't force people to do it
	Anonymous posting in all post boards
	It allows students to be in charge of their own learning
	To help match up ideas and opinions and bring new ones to the table

	Opportunities to be guided, clarify and receive feedback from 'others', opportunity to compare, so acknowledge own progress
Clarification, feedback and opportunity for sharing by others is valued	Comparing individuals answers to gain better understanding, and assisting each other
	To ask questions and have peers answer that question to the best of their ability and/or give you advice as to here to look for the answer
	I did read them all and found for the majority that they were very helpful with my studies
Virtual community is valued Common understanding of group purpose	It gives students a way of interaction on a given topic without having to gather together in the same place and time
	To be able to have contact with other students to share ideas as we do not have access to on campus tutorials
	It engages the students really well, especially online students who obviously lack face to face interaction

The themes discussed below were derived from analysis of the data.

Discussion

The pandemic has highlighted ways in which more traditional educators can energise their teaching and assessment practices. As educators, we encourage colleagues to engage in meaningful collaborative teaching via online discussion which may be facilitated and assessed. Students identified various experiences which reflected the diversity of the student cohort (Table 2). Our research questions focussed on the positive and negative learning practices and outcomes during online discussions arising from the themes identified.

Group etiquette boundaries and over-sharing of personal information

Discussion boards presented an opportunity for students to make a personal point, but not necessarily remain *neutral*. Some students focused on personal issues rather than content or the topic being discussed. The theme of needing educator moderation or facilitation to provide boundaries for topics and minimise 'over-sharing' of personal information, especially where the personality and opinions of students dominated was identified. Students noted that they would have participated more had the discussion remained on-track. Therefore, skilful educator involvement and facilitation is essential to keep discussion linked to unit content.

Boundaries are useful for forming collective understanding of purpose and desired educational outcomes. Online discussion is about relationships - these relationships achieve outcomes more effectively when expectations are clearly defined at the beginning of the semester and throughout the discussion needs and boundaries. One boundary might include appropriate terminology - part of adhering to this 'rule' might include avoiding the use of endearment with

students and keeping the voice of communication professional – free from abbreviations and emoticons.

Boundaries are rules or guidelines that formulate our discussion as to what is acceptable and what is not. An example of a guideline might incorporate a 'discussions etiquette' paragraph among other advice and expectations for online discussion.

The literature advocates that the role of online instructors is to enable peer interactivity and facilitate learning (Thompson & Ku, 2006). Facilitation needs to be fit-for-purpose and ideally enable student-centred discussions (Nickel, 2002). We consider that this is where incorporating etiquette guidelines can assist to enhance the discussion environment and experience.

Promoting engagement through assessment

Compulsory posts linked to assessment was a key theme. The literature shows that discussion boards are often linked to assessment as a strong incentive for students to participate (Choi & Tsang, 2015). Participation in discussions is critical to maximise student learning when participation is assessed, and assessment of asynchronous discussion postings is recognised as an essential component of best practice (Berry, 2008). By making discussions compulsory, students felt that the discussion was more engaging because everyone participated providing a richer discussion.

By assessing posts, students were required to be a part of an online community who collectively interacted to enhance and support peer learning. The overall response was that by making posts compulsory the group was more engaged and students might realise that discussion can be valuable. Depending on how many posts are assessed, students can receive incremental feedback from educators building their posts and enhancing their online learning. This finding is consistent with authors who have reported discussion boards can be an effective learning tool, with participation enhanced if online discussions are linked to assessment (Gregory, 2015, Da Silva, 2018).

A further insight is the concept of fear of missing out (FOMO). Whilst FOMO applies generally to social media it may have a broader application to educational technologies designed to connect students and educators. Research suggests that individuals are twice as affected by loses that they are by gains (SCLHealth.org). Alabri (2022) considered FOMO as a feeling – as stress caused by a compulsive concern that one is missing an opportunity for a rewarding experience. Linking participation to assessment may address FOMO.

Accommodating different learning styles and experiences

The literature identified that educators could enable knowledge construction by regularly posting to enhance student learning outcomes (Ghadirian & Ayub, 2017). The opportunity to promote engagement through understanding different learning styles evolved as a theme. This theme presents challenges and opportunities for teaching staff to set questions, facilitate, and control discussions. This control requires adapting to those learners who respond well to sequentially learning, or those that are deductive thinkers and prefer to go from general concepts through to more specific concepts.

Reflective learners might enjoy a more complex issue with time to think through their response whereas intuitive learners may work well from a conceptual or theory stance. The option to be anonymous is also favourable among some students (Roberts & Rajah-Kanagasabai, 2013) and is certainly applicable in discussion boards that are non-assessed and formative. An example where this may promote engagement comes from one of the authors of this study who facilitates

postgraduate student teams to write strategic organisational plans. A discussion board can allow anonymous questions and some students find the anonymity of this forum preferable to asking in a face-to-face class which contains mature age students that have industry experience.

Shaw (2019) built upon Vygotsky's (1978) work, noting that scaffolding as the role of teachers and others in supporting the learner's development. We believe that scaffolding by educators enables students to move progressively towards greater independent learning and understanding.

Experienced online education practitioners understand the difficulty in accommodating different learning styles and changing the presentation of unit content to match the audience. There is a substantial lag in communication where effective learning is the ability to have two-way communication between educators and students. Whilst this communication raises student-to-educator challenges, there is also the lack of student-to-student communication which face-to-face students appreciate. Without this interaction, online education would serve only as a medium of information transfer rather than active learning. Online discussion, however, allows students to voice questions, comments, and frustrations in a safe environment (Correia and Baran, 2010; Douglas et al., 2020a). Some students may be enrolled as international students and are not studying in their first language. An online environment provides an opportunity for the students to consider their posts and the posts presented by other students and the educator in a timelier manner. Additionally, international students can spend time understanding the posts as there is less pressure to respond rapidly in an asynchronous environment.

Clarification and feedback

Discussion boards enabled clarification, feedback and sharing with others – these activities were valued. The perception of the benefits of discussion boards was that off-campus students found online learning enabled them to *get involved* with the unit and feel part of a class as if they were in a classroom. This perception reflects the findings of Gernsbacher (2016) who also found that many students prefer online to face-to-face discussion, most likely because they can communicate, pause or reflect at a convenient time and place.

Further, the value of the virtual community, providing an interface between the face-to-face experience and that of distance students who usually lack rich interaction was recognised . Online students enjoyed the opportunity to prevent isolation and enable comparison with other students so that they could determine if they were on-track with their learning. As educators, we viewed/found this theme as students being able to construct their knowledge through dialogue and debate with peers as well as teaching staff. This finding implies timely feedback from peers rather than having to wait for formal feedback from educators is valued.

The virtual community is valued/common understanding of group purpose

Students indicated that they valued the virtual community and the inherent asynchronous nature of online discussion. Online students valued the opportunity to interact with students attending on-campus tutorials taking the opportunity to engage where they have previously lacked interaction. The flexibility provided by asynchronous discussions enabled enhanced student learning irrespective of their mode of attendance. Discussion boards can be designed to enable the participation of students who would normally feel inhibited to engage in face-to-face discussions in a traditional classroom setting (Dengler, 2008).

For distance education students, online discussion provided a platform to connect and exchange with others providing an avenue to navigate through the unit content. As educators we

understand that online discussion can assist with the *tyranny of distance* and be is some form an education support system.

An unexpected theme that emerged from analysis, was that students enjoyed mutual understanding of group purpose allowing students to oversee their own learning; comparing and contrasting ideas and opinions and 'bring new ones to the table'. Our students are diverse; some with industry experience and this had a collateral benefit to those students new to the profession. Students can bring the value of their own professional identity (knowledge and beliefs, attitudes shared across a profession) from the workplace as a health care practitioner to the classroom. The literature identifies the growing diversity of students. Kinash (2021) recognises that students have more complex lives than previous generations, as current students are often simultaneously maintaining jobs, attending to families and have concerns over financial matters. Diversity can also be appreciated in the changing holistic nature of students.

Students appreciated the autonomy of their learning and the opportunity to compare, acknowledge own progress and be guided, clarify and receive feedback from others. Students may even tackle topics together that they would not be able to explore in their own. While the potential learning benefits online collaborative and group purpose can be significant, discussions need to be supervised or facilitated by educators to stay on-track and promote meaningful progression of the discussion and collaboration (Delahunty, 2018; Douglas et al., 2020a; Evans et al., 2020).

Strategies identified for discussion board improvement

Students highlighted a genuine need for effective facilitation of discussion boards to enhance student engagement and the learning experience. This guidance enables students to be aware of the purpose of the discussions and to keep the discussions 'on topic' and relevant. Facilitation is often highlighted as important for effective online discussions (Khoshnevisan & Rashtchi, 2021) and so facilitator training in online discussions is essential as part of the effective discussion board planning and implementation (Aloni & Harrington, 2018; Douglas et al., 2020a).

Non-assessed discussion board posts can be set up to be either anonymous or authored. If assessment is linked to the discussions, then authors need to be identified, but there are situations in which author identity is not important and so anonymous posts can be utilised. This lack of identification is favourable for a number of students who feel safe posting in an anonymous group (Roberts & Rajah-Kanagasabai, 2013). Acceptance of anonymous posts should always be factored into the discussion board design.

Student ownership of discussions was also identified as favourable. Opportunities to start and contribute to discussions enhances online communication and enables students to be valued as part of the online learning community. In discussion board design, it is imperative that educators identify ways in which discussion questions can be posted as well as answered by students to enable active learning and engagement (Hudson, 2014). Engagement may be achieved by utilising compulsory online discussion early in a unit that involves answering and asking a simple question relevant to the subject content, to create a related discussion thread.

Our study indicates that thoughtfully designed discussion can enable a renewed, nuanced teaching focus applicable to communicating in an international digital world. Within this environment, online discussion must be well structured with learning objectives, assessment guidelines and educators adequately prepared and trained to enable equitable marking where

discussion is assessed. Importantly, the criteria used to assess must be articulated clearly through marking rubrics.

Implications for teaching practice

This study has immediate application to university learning and teaching practice, and provides clear strategies for educational applications. The context and elements of discussion boards in many aspects differ from more traditional approaches to teaching. Based on the findings of our study, we argue that the distinctive nature of discussion leads to specific graduate skills and knowledge derived from the flexible and the dynamic teaching approach achieved.

The super-speeding of educator skills throughout the management of the pandemic (Douglas et al., 2020b), now gives impetus to use online discussion for harnessing ideas and experiences of our students. Online discussion brings together diverse cohorts having opinions and experiences upon which to scaffold learning. This is a delightful and unique opportunity for a nuanced focus to adapt to change and design engaging, dynamic and fit-for-purpose discussion boards, which can be directed toward an international audience. These opportunities include:

1. Effective online discussion provides consecutive opportunities to reinforce and apply knowledge. Students are systematically taught critical thinking. Subsequently, students ask questions of each other providing timely feedback on their input with educators *guiding* discussions and responses. This *back-and-forth* conversation contrasts with being *lectured to*, enabling scaffolded learning. We also envisage potential for a reduced tendency to plagiarise as educators and students interact building connections whilst offering alternatives experiences. This is evident from our literature review and discussion resulting from the original work of Vygotsky (1978).

2. Student posts are more analytical as they work through, draft and edit the discussion material before posting. Active learning which is inherent in discussion boards provides a platform (online space) upon which to practice unit and industry skills. Independence in thinking learnt during discussion, using discipline-specific terminology, which can be transferred and applied to work environments. Similarly, scaffolding of learning can impact upon and target the achievement of graduate outcomes.

3. Online discussion supports and facilitates active student-centred learning and can enable teaching strategies for multiple learning styles. Effective learners can see how they may assist in a mentoring or teaching capacity. This fits the response to utilise student facilitation to enhance peer learning and student understanding (Seo, 2007) This skill can be transferred to work environments as online discussion targets the development of self-directed learning skills.

4. Less confident students are exposed to the learning processes of effective learners, thus encouraging engagement and learning from each other. This is in keeping with the work of Hall (2015) as discussion boards provide a virtual site for student collaboration. Students are enabled to explore their own propositions, promoting practices consistent with skill development as life-long learners.

5. Opportunities arise for harnessing student and educator diversity. This provides more *nuanced online conversation,* leading to fresh ways of thinking about our teaching, assessment strategies and unit content.

6. There are assessment decisions to be made in parallel with the implications discussed above. For example, the focus of learning, student numbers and size of per discussion

group and number of facilitators will influence the type of assessment effectively implemented. Comprehensive marking rubrics have a significant role with the criteria clearly communicated to students.

7. Through experience and outcomes of this study we also identify some challenges which can be seen as opportunities to be addressed. We recognise that all students are not self-directed. Some students may not undertake the prescribed learning activities before commencing discussions. This behaviour might lead to reduced levels of participation and engagement. These students may subsequently fall behind the unit schedule and be at-risk of failure. In contrast, students that are well prepared may feel that they are *carrying* those that are unprepared. Some students may view discussion as simply more *homework*, leading to an extra workload rather than an effective learning tool. This perception may be linked to previous negative experiences.

Study limitations

Online learning is one of the fastest growing learning strategies in HE, driven by the need to be physically distanced to reduce transmission of COVID-19 during the pandemic. Use of discussion boards continues as a pedagogical debate and this study has relevant outcomes and suggestions. This study, while providing useful insight into student opinions, has a low sample size and was confined to surveying students during one semester. As this study reports on the experiences in one pedagogical context, the findings should be viewed as indicative rather than establishing an empirical evidence base.

Implications for future research

Changes in HE are reflected in the design and implementation of degree courses and individual units or subjects. Discussion boards can assist to meet learning outcomes through non-traditional learning strategies, providing opportunities to develop deeper student learning. The authors envisage a new threshold for online discussion with opportunities to energise students and produce desirable graduate attributes as students engage in online learning more often. Discussion boards are able to provide this edge. More application of this form of teaching is required for future research opportunities examining skill development, scaffolding, levels of engagement and application to the work environment.

Another potential area for future research is in the usability of learning management systems (LMS). Students found using the university's LMS was problematic. A related area of potential research is learner intent – that is the influence of the effort by the student based on their commitment and desire to learn. Are they enrolled just to pass the unit or to enhance their learning? It would also be relevant to investigate if educators viewed technology as just a tool rather than an embedded part of the learning process.

Conclusion

The use of discussion boards continues to grow, with HE needs and responses to changing traditional teaching super-speeded through the pandemic, along with the importance of developing students' critical thinking. The ability to effectively incorporate online discussion boards into HE learning, is an evolving challenge. Findings of this study indicated that continuance in improving integration of asynchronous discussion into curriculums can enable

effectual, engaged even invigorated online engagement and learning. By surveying students, then analysing to find key themes in their experiences, this study contributes to the understanding of how students use online discussion, and how they might be motivated to contribute in more engaged and meaningful ways. Implications for policy and practice may enhance connection between learning outcomes of units and the ability of students and teaching staff to use educational technology to achieve these outcomes.

Carefully designed and skilfully facilitated, discussion boards can provide a rich interaction between students and their educators. When a clearly defined and supported discussion atmosphere is fostered, students can initiate and direct conversation with some guidance from the facilitator, with the aim of becoming confident and interactive participants in information gathering and exchange. The benefit of these skills goes beyond the virtual classroom to a graduate with desirable attributes for future employers.

Statements

Research ethics approval was obtained for this study by the Social Sciences Human Research Ethics Committee at the university where the data was collected and was conducted in strict accordance with the rules and guidelines applicable to ethical research practices involving human participants (H0013544). The authors report no conflict of interests in conducting this research.

References

Ajayi, L. (2009). An exploration of pre-service teachers' perceptions of learning to teach while using asynchronous discussion board. *Educational Technology & Society*, *12*(2), 86-100.

Aloni, M., & Harrington, C. (2018). Research based practices for improving the effectiveness of asynchronous online discussion boards. *Scholarship of Teaching and Learning in Psychology, 4*(4), 271–289. **https://doi.org/10.1037/stl0000121**

Alabri, A. (2022). Fear of Missing Out (FOMO): The effects of the need to belong, perceived centrality, and fear of social exclusion, *Human Behavior and Emerging Technologies,* Article ID 4824256, 12 pages, 2022. **https://doi.org/10.1155/2022/4824256**

Badawy, A. H. A. (2012). Students' perceptions of the effectiveness of discussion boards: What can we get from our students for a freebie point. *International Journal of Advanced Computer Science and Applications*, *3*(9). **https://doi.org/10.14569/IJACSA.2012.030920**

Baldwin, L., & Sabry, K. (2003). Learning styles for interactive learning systems, *Innovations in Education and Teaching International, 40*(4), 325-340.

Beaudin, B. P. (1999). Keeping online asynchronous discussions on topic. *Journal of Asynchronous Learning Networks*, *3*(2), 41-53.

Berry, G. (2008). Asynchronous discussions: Best practices. In *24th Annual Conference on Distance Teaching & Learning.* University of Wisconsin System.

Biesenbach-Lucas, S. (2003). Asynchronous discussion groups in teacher training classes: Perceptions of native and non-native students. *Journal of Asynchronous Learning Networks*, *7*(3), 24-46.

Boonmoh, A., & Jumpakate, T. (2019). Using scaffolded instructions to improve students' skills. *Reflections, 26,* 1-16.

Choi, H. M., & Tsang, E. Y. (2015). Students' satisfaction and perceived attainment in the use of an online discussion forum: A follow-up study in the OUHK. *Studies and Practices for Advancement in Open and Distance Education*, 265.

Christensen, P., Poehl, T., & McFerrin, K. (2018). Assessing student perception of online discussion forums. *Proceedings of Society for Information Technology & Teacher Education International Conference*. Washington. **https://www.learntechlib.org/primary/p/182511/**

Cole, M. et al. (Eds.) (1978). *L. S.Vygotsky: Mind in society: the development of higher psychological processes*. Harvard University Press.

Collins, A., Greeno, J., & Resnick, L. (2001). Educational learning theory. In N. J. Smelser & P. B. Baltes (Eds.), *International encyclopedia of the social & behavioral sciences* (Vol. 12, pp. 4276-4279). Elsevier.

Correia, A. P., & Baran, E. (2010). Lessons learned on facilitating asynchronous discussions for online learning. *Educação, Formação & Tecnologias, 3*(1), 59-67.

Cowling, M. A., Crawford, J., Vallis, C., Middleton, R., & Sim, K. (2022). The EdTech difference: Digitalisation, digital pedagogy, and technology enhanced learning. *Journal of University Teaching & Learning Practice, 19*(2), 1-13. **https://doi.org/10.53761/1.19.2.1**

Da Silva, L. F. C., Barbosa, M. W., & Gomes, R. R. (2019). Measuring participation in distance education online discussion forums using social network analysis. *Journal of the Association for Information Science and Technology*, *70*(2), 140-150. **https://doi.org/https://doi.org/10.1002/asi.24080**

Delahunty, J. (2018). Connecting to learn, learning to connect: Thinking together in asynchronous forum discussion. *Linguistics and Education*, *46*, 12-22.

Dengler, M. (2008). Classroom active learning complemented by an online discussion forum to teach sustainability, *Journal of Geography in Higher Education*, 32(3), 481-494, **https://doi: 10.1080/03098260701514108**

Dennen, V. P. (2005). From message posting to learning dialogues: Factors affecting learner participation in asynchronous discussion. *Distance Education*, *26*(1), 127-148. **https://doi.org/https://doi.org/10.1080/01587910500081376**

Douglas, T., Mather, C., Murray, S., Earwaker, L., James, A., Pittaway, J., Robards, B., & Salter, S. (2015). *A comparison of undergraduate student experiences of assessed versus non-assessed participation in online asynchronous discussion groups: Lessons from a cross disciplinary study in health and sociology*. Globally connected, digitally enabled: 32nd Annual Conference of the Australian Society for Computers in Tertiary Education (ASCILITE 2015), Perth, Australia. **http://www.2015conference.ascilite.org/wp-content/uploads/2015/11/ascilite-2015-proceedings.pdf**

Douglas, T., James, A., Earwaker, L., Mather, C., & Murray, S. (2020a). Online discussion boards: Improving practice and student engagement by harnessing facilitator perceptions, *Journal of University Teaching & Learning Practice*, *17*(3). **https://doi.org/10.14453/jutlp.v17i3.7**

Douglas, T., Mather, C., Earwaker, L., James, A., & Murray, S. (2020b). Supporting digital engagement: an evaluation of the use of a guide for effective development and facilitation of online discussion boards. *Journal of Applied Learning & Teaching*, *3*(1), 1-10. **https://doi.org/10.37074/jalt.2020.3.s1.13**

Ebrahimi, A., Faghih, E., & Dabir-Moghaddam, M. (2017). Student perceptions of effective discussion in online forums: A case study of pre-service teachers. *Innovations in Education and Teaching International, 54*(5), 467-475. **https://doi.org/10.1080/14703297.2016.1143858**

Evans, S., Knight, T., Sønderlund, A., & Tooley, G. (2014). Facilitators' experience of delivering asynchronous and synchronous online interprofessional education. *Medical Teacher*, *36*(12), 1051-1056. **https://www.tandfonline.com/doi/full/10.3109/0142159X.2014.918254**

Evans, S., Knight, T., Walker, A., & Sutherland-Smith, W. (2020). Facilitators' teaching and social presence in online asynchronous interprofessional education discussion. *Journal of interprofessional care*, *34*(4), 435-443.

Forman, T. M. (2018). Student perceptions of online learning: Discussion board assignments. *ERIC* (November 2018), 1-25. **https://eric.ed.gov/?id=ED595007**

Gernsbacher, M. A. (2016). Five tips for improving online discussion boards. **https://www.psychologicalscience.org/observer/five-tips-for-improving-online-discussion-boards**

Ghadirian, H., & Ayub, A. F. M. (2017). Peer moderation of asynchronous online discussions: An exploratory study of peer e-moderating behaviour. *Australasian Journal of Educational Technology*, *33*(1). **https://doi.org/https://doi.org/10.14742/ajet.2882https://doi.org/https://doi.org/10.14742/ajet.2882**

Gilbert, P. K., & Dabbagh, N. (2005). How to structure online discussions for meaningful discourse: A case study. *British Journal of Educational Technology*, *36*(1), 5-18. **https://doi.org/10.1111/j.1467-8535.2005.00434.x**

Gregory, S. (2014). Discussion boards as collaborative learning tools. *International Journal of Continuing Engineering Education and Life Long Learning*, *25*(1), 63-76. **https://doi.org/10.1504/IJCEELL.2015.066548**

Hall, R. A. (2015). Critical thinking in online discussion boards: Transforming an anomaly. *Delta Kappa Gamma Bulletin*, *81*(3), 21–27.

Hanna, E., Soren, B., Telner, D., MacNeill, H., Lowe, M., & Reeves, S. (2013). Flying blind: The experience of online interprofessional facilitation. *Journal of Interprofessional Care*, *27*(4), 298-304. **https://doi.org/https://doi.org/10.3109/13561820.2012.723071**

Hartman, H. (2002). Scaffolding & cooperative learning. *Human Learning and Instruction* (pp. 23-69). City College of City University of New York.

Hew, K. F. (2015). Student perceptions of peer versus instructor facilitation of asynchronous online discussions: Further findings from three cases. *Instructional Science*, *43*(1), 19-38. **https://doi.org/https://doi.org/10.1007/s11251-014-9329-2**

Hew, K. F., Cheung, W. S., & Ng, C. S. L. (2010). Student contribution in asynchronous online discussion: A review of the research and empirical exploration. *Instructional Science*, *38*(6), 571-606. **https://doi.org/https://doi.org/10.1007/s11251-008-9087-0**

Hudson, K. A. (2014). Teaching nursing concepts through an online discussion board. *Journal of Nursing Education*, *53*(9), 531-536.

Johnson, C. M. (2016). Rethinking online discourse: Improving learning through discussions in the online classroom. *Education and Information Technologies*, *21*(6), 1483-1507. **https://doi.org/https://doi.org/10.1007/s10639-015-9395-3**

Johnson, D. W., Johnson, R. T (1986). Cooperative learning in the science classroom. *Science and Children*, *24*, 31-32.

Keengwe, J., Adjei-Boateng, E., & Diteeyont, W. (2013). Facilitating active social presence and meaningful interactions in online learning. *Education and Information Technologies*, *18*(4), 597-607. **https://doi.org/https://doi.org/10.1007/s10639-012-9197-9**

Kelly, D., Baxter, J. S., & Anderson, A. (2010). Engaging first-year students through online collaborative assessments. *Journal of Computer Assisted Learning*, *26*(6), 535-548. **https://doi.org/https://doi.org/10.1111/j.1365-2729.2010.00361**.

Khoshnevisan, B., & Rashtchi, M. (2021). Developing online discussion boards to increase student engagement during the COVID-19 pandemic. *Dual Language Research and Practice Journal*, *4*(1), 39-50.

Kinash, S. (2021). Student experience: 10 things I know for certain. *Journal of University Teaching & Learning Practice, 18*(8). **https://ro.uow.edu.au/jutlp/vol18/iss8/02**

Ladyshewsky, R. (2013). Instructor presence in online courses and student satisfaction. *The International Journal for the Scholarship of Teaching and Learning*, *7*(1), 1-23. **http://digitalcommons.georgiasouthern.edu/ij-sotl/vol7/iss1/13/**

Lander, J. (2014). *The role of the interpersonal in online knowledge construction: unrealised or unrealisable potential?* Rhetoric and reality: Critical perspectives on educational technology, 31st Annual Conference of the Australian Society for Computers in Tertiary Education (ASCILITE 2014), Dunedin, New Zealand. **http://www.ascilite.org/conferences/dunedin2014/files/fullpapers/17**

Lang, D. (2000). Critical thinking in web courses. *Syllabus, 9*, 20–24.

Langford, M., & Damsa, C. (2020, September 20, 2021). *Online teaching in the time of COVID-19: Academic teachers' experience in Norway*. Centre for Experiential Legal Learning, University of Oslo. **https://www.jus.uio.no/cell/ressurser/evaluering/rapporter/report-university-teachers-160420-with-annex.pdf**

Lee, S. W.-Y., & Tsai, C.-C. (2011). Identifying patterns of collaborative knowledge exploration in online asynchronous discussions. *Instructional Science*, *39*(3), 321-347. **https://doi.org/https://doi.org/10.1007/s11251-010-9131-8**

Lim, C. P., & Cheah, P. T. (2003). The role of the tutor in asynchronous discussion boards: A case study of a pre-service teacher course. *Educational Media International*, *40*(1-2), 33-48. **https://doi.org/https://doi.org/10.1080/0952398032000092107**

Martin, A. (2014). *Making online discussion more dynamic and engaging*. Arizona State University Teach Online. **https://teachonline.asu.edu/2014/01/making-online-classroom-discussion-dynamic-engaging/**

Nickel, T. B. (2002). *Student-to-student interaction in online discussions: The role of moderator status*. Utah State University.

Ng, C. S., Cheung, W. S., & Hew, K. F. (2012). Interaction in asynchronous discussion forums: peer facilitation techniques. *Journal of Computer Assisted Learning*, 28(3), 280-294. **https://doi.org/https://onlinelibrary.wiley.com/doi/10.1111/j.1365-2729.2011.00454.x**

Northover, M. (2002). *Online discussion boards-friend or foe?* Winds of change in the sea of learning: 19th Annual Conference of the Australian Society for Computers in Tertiary Education (ASCILITE 2002), Auckland, New Zealand. **https://www.ascilite.org/conferences/auckland02/proceedings/papers/193.pdf**

Olson, J. & Platt, J. (2000). *The instructional cycle. Teaching children and adolescents with special needs* (pp. 170-197). Prentice-Hall, Inc.

Pena-Shaff, J., Altman, W., & Stephenson, H. (2005). Asynchronous online discussions as a tool for learning: Students' attitudes, expectations, and perceptions. *Journal of Interactive Learning Research*, *16*(4), 409-430. **https://www.learntechlib.org/p/5964/**

Raymond, E. (2000). *Learners with mild disabilities: A characteristics approach.* Pearson.

Roberts, L. D., & Rajah-Kanagasabai, C. J. (2013). "I'd be so much more comfortable posting anonymously": Identified versus anonymous participation in student discussion boards. *Australasian Journal of Educational Technology*, *29*(5), 612-625.

Rodas, C. R. (2016). The use of online tutoring to promote higher-level thinking skills in English language learners using asynchronous discussion boards in teacher preparation programs. Society for Information Technology & Teacher Education International Conference, Savannah, Georgia, United States. **https://www.learntechlib.org/p/172013/**

Sankey, M. D. (2022). The state of Australasian online higher education post-pandemic and beyond. *Journal of University Teaching & Learning Practice, 19*(2), 14-26. **https://doi.org/10.53761/1.19.2.2**

SCL Health (2022). Why we deel FOMO (Fear of Missing Out) and what to do about it. **https://www.sclhealth.org/blog/2019/03/why-we-feel-fomo-and-what-to-do-about-it/**

Seo, K. K. (2007). Utilizing peer moderating in online discussions: Addressing the controversy between teacher moderation and non-moderation. *American Journal of Distance Education*, *21*(1), 21-36. **https://doi.org/https://doi.org/10.1080/08923640701298688**

Shaw, A. (2019). *Scaffolding learning in the online classroom*. Center for Teaching and Learning. **https://ctl.wiley.com/scaffolding-learning-in-the-online-classroom/**

Steen, T. M. (2015). Facilitating online learning activities through the discussion board: A first year university students' perspective. *International Journal of Continuing Engineering Education and Life Long Learning*, *25*(1), 77-102. **https://doi.org/10.1504/IJCEELL.2015.066549**

Thomas, J. (2013). Exploring the use of asynchronous online discussion in health care education: A literature review. *Computers & Education, 69*, 199-215. **https://doi.org/https://doi.org/10.1016/j.compedu.2013.07.005**

Thomas, G., & Thorpe, S. (2019). Enhancing the facilitation of online groups in higher education: a review of the literature on face-to-face and online group-facilitation. *Interactive Learning Environments, 27*(1), 62-71. **https://doi.org/10.1080/10494820.2018.1451897**

Thompson, L., & Ku, H. Y. (2006). A case study of online collaborative learning. *The Quarterly Review of Distance Education, 7*(4), 361–375.

Tichavsky, L., Hunt, A., Driscoll, A., & Jicha, K. (2015). "It's just nice having a real teacher": Student perceptions of online versus face-to-face instruction. *International Journal for the Scholarship of Teaching & Learning*, *9*(2), 1-8. **https://digitalcommons.georgiasouthern.edu/ij-sotl/vol9/iss2/2/**

Tsiotakis, P., & Jimoyiannis, A. (2016). Critical factors towards analysing teachers' presence in on-line learning communities. *The Internet and Higher Education, 28*, 45-58. **https://doi.org/10.1016/j.iheduc.2015.09.002**

Valenti, E., Feldbush, T., & Mandernach, J. (2019). Comparison of Faculty and Student Perceptions of Videos in the Online Classroom. *Journal of University Teaching and Learning Practice*, *16*(3), 1-21. **https://ro.uow.edu.au/jutlp/vol16/iss3/6**

Van Der Stuyf, R. R. (2002). Scaffolding as a teaching strategy. *Adolescent learning and development*, *52*(3), 5-18.