The digital-intercultural-transdisciplinary nexus: Online international exchanges for transdisciplinary education

Jack Tsao
The University of Hong Kong, Hong Kong

Sakinah Alhadad, Danielle H. Heinrichs
Griffith University, Australia

Suraiya Abdul Hameed, Kate McLay
The University of Queensland, Australia

Transdisciplinary problem-solving using digital technologies can further the internationalisation agenda within higher education through an inquiry-based collaborative online international exchange that is transformative and contributes real-world knowledge. Our study focused on a 12-week fully online programme bringing together undergraduates and postgraduates from a Hong Kong university and two Australian universities to research the well-being of university students. Drawing on Pierre Bourdieu's concepts of field and habitus, we analysed the implementation and effectiveness of digital technologies in influencing the students' experiences of sharing, learning and collaboration practices. The findings highlight the significance of online learning spaces for intercultural sharing beyond disciplinary spaces and generate tensions and ambiguities that provoke students to critically reflect on comparative cultural and social perspectives. This space for educational exploration and possibilities can move students beyond the taken-for-granted and expose them to diverse viewpoints and ways of thinking conducive to transdisciplinary learning and research.

Implications for practice or policy:

- Higher education institutions and educators can leverage purposefully designed digital technologies and structured online exchange programmes to create equitable international and transdisciplinary collaboration and inquiry spaces.
- Educators can use multimodal digital technologies, such as collaborative platforms (e.g., Miro, Canva) and creative methods (e.g., digital storytelling, body mapping) for students to engage with ambiguity, negotiate cross-cultural tensions and build critical self-awareness in collaborative settings.
- Higher education institution policies can support students as co-creators of knowledge.

Keywords: digital transformation in education, collaborative online international learning (COIL), higher education, student well-being, transdisciplinary education, case study

Introduction

Transdisciplinary education has been receiving wider attention across higher education due to its promise of developing holistic graduate capabilities and competencies of students to address ill-defined, wicked and emerging sustainability challenges. The transdisciplinary approach asserts that novel solutions to addressing these complex problems require not only disciplinary knowledge but also the embodied social and cultural understandings from the participation of diverse actors and stakeholders (Rigolot, 2020; Scott, 2017) . At its core, a central tenet is transversality, the capacity to interact and connect across disciplinary, cultural and epistemological boundaries to cultivate integrative and relational ways of knowing (Guattari, 2015). Students' understanding of diverse perspectives and international, intercultural or global dimensions can generate socially robust knowledge contributing to society (de Wit & Hunter, 2015) and sustainable futures. The exponential progress in digital technology in the context of education creates opportunities for personalised, accessible and engaging learning experiences that advance transdisciplinary perspectives in our global and digitally mediated entangled contemporary contexts

(Lodge et al., 2017; Southworth et al., 2023). This is particularly pertinent with the increase in everyday cyber-space-time emergence, where digital interactions (re)shape our perceptions of space and time (Nicolescu, 2018).

Digital technologies are intimately connected with the agenda of the internationalisation of higher education, with online international exchanges emerging to facilitate supplementary, complementary or alternative experiences, especially in responding to ecological and economic issues (Richardson, 2016) and equity concerns of physical mobility that are only available to a tiny minority. Online interactions between students across institutions and sociocultural contexts can enable the multimodal sharing of different approaches and perspectives essential for transdisciplinary responses to common real-world problems. Digital platforms can widen participation and allow cross-cultural collaboration, promote global mindsets for appreciation and sharing of pluriversal cultural viewpoints (Duffy et al., 2022; Garcia et al., 2023; Lee et al., 2022), accelerate the reduction of intercultural misunderstandings (Hackett et al., 2023) and foster collaborative, transnational and peacemaking initiatives (Lenkaitis & Loranc, 2022) and prepare students for future work environments and situations that are increasingly collaborative and hybrid (Sierra et al., 2022). These potentials resonate with essential capacities for transdisciplinary problem-solving around recognising and valuing the interplay among various stakeholders and self-reflexive (re)organisation in response to multiple perspectives and problem-solving methodologies.

Hence, technology-enabled international pedagogies, also called virtual exchanges (VEs) or online international learning, can enable collaborative, inquiry-based, problem-based and computer-supported learning (Sierra et al., 2022). This combination can embody the characteristics of what Klein (94, p. 1) delineated as hybrid communities that facilitate collaboration and integrative problem-solving "at the boundaries in space and between systems and subsystems". An example is the collaborative online international learning (COIL) model (State University New York, n.d.), which has experienced rapid adoption by a network of universities globally over the last few years, coinciding with friction to mobility due to the COVID-19 pandemic (Rubin & Guth, 2023). COIL facilitates pedagogical partnerships between two or more universities, allowing faculty and students to engage jointly in course-specific teaching and learning across geographic spaces.

Digitally mediated intercultural project

Although a burgeoning corpus of scholarship exists around collaborative online international exchanges for learning, transdisciplinary curriculum and student partnerships, publications integrating digital technologies in VEs with inquiry-based pedagogies focusing on transdisciplinary real-world problem-solving and knowledge generation are still scarce. Examples include the online collaborative exchange project by Buchmüller et al. (2021) between German and Indian universities researching community responses to social inequities and technological access during the COVID-19 pandemic. The project facilitated intercultural and transdisciplinary student engagement through a repertoire of activities, including personal narrative exchanges, ideation sessions, community interviews and future scenario construction. The findings illuminated how online collaboration may "slow down" problem-solving as students navigate cultural divergences in teamwork. Still, these challenges culminate in a more profound and satisfying learning journey as students assimilate disparate perspectives and engage with diverse problem-solving frameworks. Similarly, Leibinger and Toland (2023) examined a virtual transdisciplinary endeavour involving six European universities researching creative engagements with public spaces, underscoring the teacher's role as facilitator, the creation of open and inclusive participatory online spaces and the integration of play and games to stimulate student curiosity. Here, cultural and personal coherence amongst student collectives was identified as critical to successful collaborative dynamics.

Our study contributes to the digital-intercultural-transdisciplinarity nexus. To do this, we examined a fully online co-curricular project conducted during the pandemic in late 2022, bringing together university students from diverse disciplinary backgrounds across Hong Kong and Australia to explore and research their conceptions of student well-being. Moreover, the well-being of university students is an ideal transdisciplinary topic and wicked problem (Larsen & Emmett, 2023) that benefits from cross-cultural comparative insights by the students themselves, informed by their first-hand lived experiences. Student

well-being is complex because it intersects personal (psychological), institutional, cultural pressures, constraints and interdependencies. It occurs during a liminal moment of the students' lives that is sensitive to cultural and ethical configurations that make standardised solutions challenging to implement. The global surge in mental health crises within higher educational institutions and challenges to young people's well-being and quality of life during and post-pandemic renders it a pertinent field of inquiry (Heinrichs et al., 2023; Rezapour et al., 2022).

Our research question asks how the digital is a significant site for the intercultural and how this is necessary for students engaging in real-world problem-solving around their individual and collective well-being. The paper discusses practical implementational issues such as appropriate technological tools, learning experience design practices and facilitation strategies that are implicated in fostering collaborative online research-driven and inquiry-based pedagogies. Although the focus is on the digital and intercultural aspects, transdisciplinarity serves as a valuable framework for the broader purpose, context and orientation for learning. It signals an inclusive movement across ontologies and epistemologies, integrating and synthesising students' affects, narratives and subjective understandings as valid forms of knowledge (Max-Neef, 2005; Pohl & Hirsch Hadorn, 2007). These are considered alongside academic disciplinary knowledge to address student well-being challenges and produce sustainable, practically grounded and culturally competent responses. Our use of the trans(disciplinary) is not only for students to draw on their disciplinary knowledge (the inter- or multi-). This would happen implicitly, even if not explicitly called for. Instead, transdisciplinary knowledge manifests in a *middle space* (Nicolescu, 2002), where tensions and contradictions across different perspectives are negotiated and reconciled (Nicolescu, 2018). We are very much aware of the contested and evolving definitions of transdisciplinary and its usefulness against definitions of inter- and multi-disciplinarity except to say that disciplines as fields – as we shall mention in the next section – are relations of power, and part of our study makes a case for how the digital-intercultural-transdisciplinary nexus works in middle spaces that reduce these power relations.

The research decentres teachers' subject matter expertise by offering students an empowering space to exercise autonomy in interpretation and discovery, mediated through the digital and intercultural. Students are encouraged to recognise their positions as affected social actors, attend to the creative possibilities to effectuate improvement to their prevailing circumstances and produce socially robust knowledge that can be translated into their lives. By letting the students participate in their interpretations of well-being, we enabled them to uncover their common sense, insights and shared beliefs about well-being that resonated with the collective experiences and values of their peer cultures. Simultaneously, this decentred approach blurs the line between subject and researcher.

Theorising the online exchange space

We drew on Bourdieu's (1977, 1984) concept of *fields* and *habitus* to analyse how digital technologies mediate the intercultural, enabling students to collaborate online alongside international peers with varying perspectives for transdisciplinary problem-solving. Specifically, the conceptual tools assist in thinking about how intercultural exchanges may act upon and transform individual subjectivities, shaping and being shaped by the complex practices and power dynamics inherent in digital social spaces.

Fields as metaphorical social spaces and relations of power can describe digital, disciplinary or contextual boundaries, with their own logics and presuppositions, that are permeable, mutable, competing and overlapping with other fields (Bourdieu, 1977, 1984; Bourdieu & Wacquant, 1992). Dominant fields maintain rigid boundaries and logics that preserve their autonomy and orthodoxy over knowledge claims and resources, while weaker fields remain more open to influence and transformation. Digital social spaces are enabled and constrained by technology's technical capacities, initiated through teachers' pedagogical intent and only constituted (legitimised) by the teacher and students' access and expressions. This participation is improvisatory instead of mechanical or deterministic (strategies, not rules) and probabilistically generated as the interplay between the socio-material conditions of the field and individuals' durable but transposable dispositions (habitus) and technical and social capabilities. The non-deterministic and improvisational aspects of practice align with Fawns' (2022) concept of entangled

pedagogy, emphasising the negotiated agency among teachers, students and technologies, which reflects the complex, contextual and relational dimensions of digital technologies and its contingent outcomes.

Significantly, habitus contingently adjusts to the constraints, demands and opportunities presented in the field (Bourdieu, 1990b). Hence, pedagogical intent applied to different digital technologies and the students' contributions informed by their differing stances and backgrounds can collectively produce unique affordances, norms, logics and ambiguities within the digital space for transformative outcomes to emerge. When digital social spaces act as sites outside the familiar, they can accommodate positions or practices for negotiation, dissensus, and reflection. In other words, the interplay of subjective habitus with the objective digital field affects their activities and positions (e.g., collaboration), demonstrating the dialectical relationship where social practices are shaped by and shape the field's conditions. Bourdieu (1990a, p. 116) noted that habitus can be transformed "through awakening of consciousness and socioanalysis" , which may come from habitus-field disjuncture. However, working with(in) dominant disciplinary fields – characterised by more rigid boundaries and logics – is not productive for creative and complex problem-solving. Instead, digitally enabled intercultural spaces that bring together people from different cultures and perspectives are more generative. The inherent diversity, tensions and contradictions in the intercultural create conditions in visibilising the taken-for-granted or provoking a crisis of meaning, which can disrupt habituated dispositions or presuppositions towards reflexivity and change (Barrett, 2015).

Methodology

Participants, data collection and analysis

Our co-curricular project exploring student well-being was a collaboration between the University of Hong Kong, The University of Queensland and Griffith University, held from September to November 2022. In total, 34 students (aged between 18 and 35) from the three universities participated, with 21 students from Hong Kong and 13 from Australia. Participants were a mix of local and international undergraduate and postgraduate master's students across diverse disciplines, including education, science, business and economics, arts, social science, architecture, and medicine. Students studying in Australia were mainly recruited from education disciplines; however, the student cohorts were more ethnically diverse, highlighting Australia's multicultural context. Although the mixed cohort introduced asymmetries in knowledge and skills, we viewed heterogeneity as a forte and prerequisite for transdisciplinary problem-solving. Recruitment was openly advertised, and students were free to join. Participating students originated from diverse cultural backgrounds from Hong Kong, Australia, mainland China, Macau, Taiwan, Korea, Japan, India, Indonesia, Cyprus, Malaysia, Laos and Panama. The five teachers facilitating the programme were also ethnically diverse. Ethical clearance was granted by the three institutions. As a co-curricular project, students' participation was voluntary, and they could withdraw without consequence. Six students withdrew before the end of the programme, citing heavy formal course assessments and time constraints.

The data collected consisted of the outputs and responses from multiple facilitated and self-directed activities, recorded workshops, written reflections, final research presentations and reports and post-programme feedback (with 22 responses). Our data analysis for this study focused mainly on the students' reflections collected progressively throughout almost every workshop and the end-of-programme self-reported feedback consisting of a mix of Likert-scale and open-ended questions around aspects of collaboration and communication, what they enjoyed, challenges, recommendations for improvement and learnings. We adopted an exploratory case study approach (Yin, 2018) to examine the digital, intercultural and transdisciplinary, treating each group of students and their activities as embedded units of analysis. Thematic analysis (Braun & Clarke, 2006) identified patterns related to students' collaborative practices, reflexivity and research skill development, supported by axial coding (Corbin & Strauss, 2008) to explore relationships between codes such as "digital affordances", "ambiguities" and "intercultural tensions". This combined approach allowed us to systematically analyse how the interplay of digital technologies, cultural contexts and collaborative problem-solving shaped students' experiences.

Our analysis first considered how the field of digital space around this programme was formed and how it mediated individual expressions. We then analysed the relations between the individuals within this space, identifying the intercultural and collaborative problem-solving dynamics and the research experiences, paying particular attention to developing dispositions. Coding centred around the way students experienced the programme and navigated the digital space, their cross-cultural interactions and collaborations and their perspectives on pursuing research. The students' words and representations are understood as shaped by their social and historical contexts, reflecting underlying assumptions and values influenced by their cultural, educational and personal experiences (Wacquant, 1989). These articulations provided a sense of how students' practices are tied to their individual and collective identities, intertwined with their capacities and capabilities for expression and engagement with plural and ambiguous values. As researchers, we also engaged in epistemic reflexivity (Bourdieu & Wacquant, 1992) through a constant reference between our data and the theory while acknowledging how our positionality as a teacher and our varied cultural and ethnic backgrounds impose on the emergence and interpretation of the data.

Programme structure and objectives

The programme's primary objective was for students to research the diverse ways university students framed their well-being and promote intercultural understanding to make a creative and original contribution to the study of this field. A secondary goal was to enable the building of friendships and networks during the pandemic-induced constraints for mobility across 2021 and 2022. Effective online exchanges require intentionality, planning and goal setting, not merely bringing students together (Zhang et al., 2023). Our exchange was loosely modelled after the COIL model (State University New York, n.d.), which consists of four progressions: Team-building phases consisting of introductions and icebreakers; comparative discussions; collaborative project work and problem-solving; presentations and reflections. The overall programme is outlined in Figure 1.

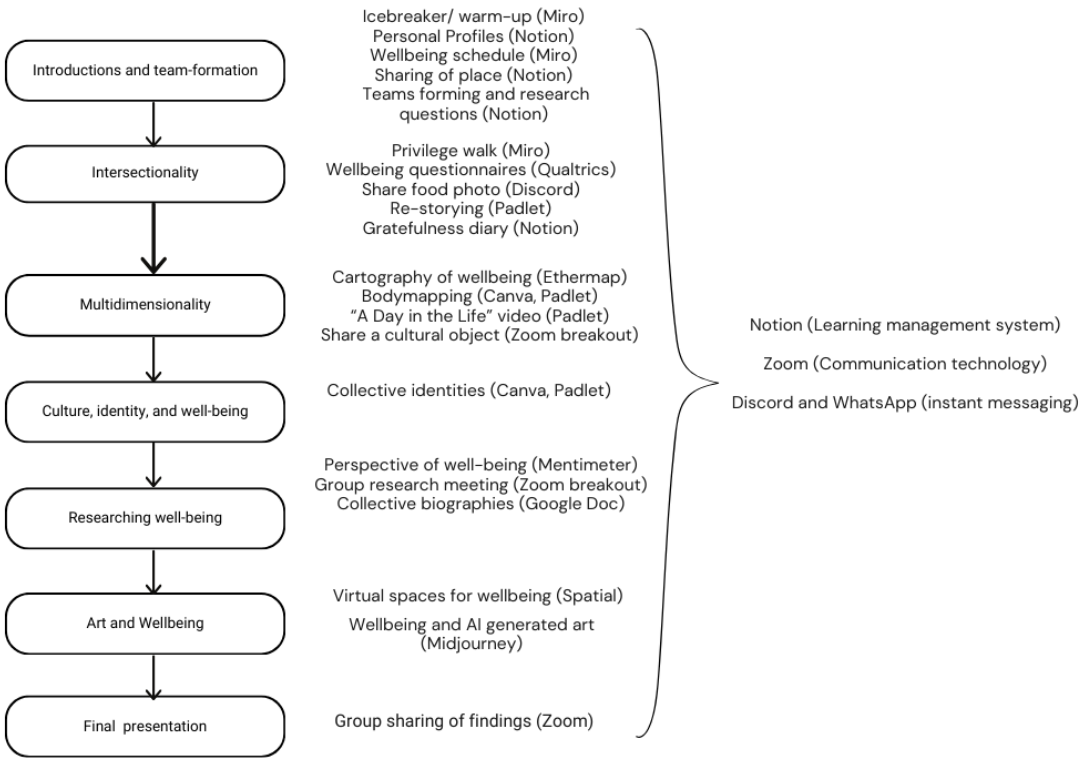

Figure 1. The structure of the VE programme and the digital technologies utilised

The exchange was designed around eight online sessions held on Zoom. Students utilised desktop computers, laptops, tablets and mobile devices for access. These sessions gradually introduced key concepts of university well-being, covering the theoretical and methodological (including methods) relevant to support students' domain-specific research literacy whilst encouraging them to critically evaluate current knowledge based on methods of choice, reflecting on their lived experiences and integrating that with their proposed group research. The core assignment formed students into groups of three or four to explore well-being and everyday life, intersectionality and conceptions of multidimensional well-being, identity and sense of belonging during the pandemic and digital technology's impact on youth well-being. Each group was assigned two teachers with 5–10 years of academic research experience as research mentors,. We encouraged students to use the different research methods and data generated during the workshops with their peers to answer their research questions. However, students were free to generate and collect additional data if required.

The digital-intercultural-transdisciplinary nexus

Our discussion focuses on how particular uses of digital technologies within an inquiry-based context can develop intercultural conversations to research student well-being from diverse and multiple perspectives. First, we discuss cases of how digital technologies became sites for students' personal and intercultural sharings and dialectical relations between students' digital expressions and the online social space. Next, we focus on how the digital and intercultural can create spaces for ambiguity and conflict that are productive for reflexive transformation and learning. Last, we articulate how this informs the participants' research around student well-being.

Digital intercultural expressions

First and foremost, online exchange spaces for an educational course are temporary and arbitrary, necessitating a process of reifying legitimacy. Online participation and collaborative interactions can be framed as performative and improvisatory practices – socially and materially informed individual expressions and discourses which reflect cognitive, affective and behavioural dispositions (habitus) and capitals contingent on the opportunities established by the pedagogical-digital affordances. These collective practices co-construct the digital social space via its reification in digital forms and the way they inform upon further practices. Achieving a sense of belonging in online learning environments requires multiple layers of engagement and participation integrated into the learning experience (Thomas et al., 2014). As students iteratively interface with and through the online environment, they connect, navigate and position themselves relationally to other students and teachers, enhancing their personal and collective learning experiences.

Moreover, the digital technologies we deployed are also designed for general purposes (not specifically for education); hence, accessing its affordances requires technical competence and creative adaptation for pedagogical purposes. This is not to deny that differential digital, linguistic and intercultural communication capacities may result in marginalisation (Naicker et al., 2022). Indeed, students remarked on the complexity and "confusion" of managing several digital applications. A few others expressed becoming "lost" when using the virtual reality application Spatial, including accessibility barriers due to insufficient computing resources. These issues underscore teachers' facilitative role in interweaving inclusive pedagogical approaches and digital technologies that facilitate accessibility and sharing alongside innovative ones needed to provoke more reflexive capacities and disrupt the taken-for-granted.

We selected Notion as a central learning management platform for hosting the programme materials and relevant information because of access and permission features, customisable templates, database functionality and cross-digital platform interoperability and integration capabilities for constructing a unified workspace. We reconfigured Notion's flexibility to offer customisable spaces for student' self-expression. For example, under a section for personal introductions, 32 out of 34 students constructed their profiles, posting photographs, brief written self-introduction, inspirational quotes and selections of favourite books, films, games and songs. Digital spaces offer a more equitable and more encompassing

scope of individual expressions – in digital written, visual (video, pictures), auditory (oral, sounds) and non-linguistic formats (emojis, gifs) – facilitating both accelerated engagement and a wider distribution among students, compared with physical classrooms. The incorporation of multimedia for a more textured articulation of their narratives and identities as performative acts of self-expression surfaced glimpses of the students' dispositions and their distinctive configurations of capabilities (including digital), converting this into digital objects and artefacts constructed around their educational backgrounds, familial relations, ethnic and cultural identifications, hobbies, personalities, aspirations and the media they consumed (embedding YouTube clips and Spotify playlists). These digital representations facilitate reproduction, adaptation and stimulation by peers but also act as staked positions within a micro-digital field and allow asynchronous comments that serve as a bridge for forming social connections. Peer-to-peer conversations focused on traces of shared interests and intercultural affinity, mutual inspiration and curiosity (students' names are replaced with pseudonyms):

> Evelyn: Omg slayy Clara! That quote really empowered me <3
> James: Hi Clara. You got a good taste of music. I'm a Caribbean boy, so in my playlist can't miss reggae, dancehall, and afrobeats. Nice meeting you!
>
> Natalie: Hi Sarah! I am so happy to know that we're sharing a similar major (I am studying English and English education as well). I really find it fun to study English Literature, though I don't have much experience in exploring drama. (I usually enjoy reading stories and poems) yet drama sounds super intriguing to me as well!
> James: Hi Sarah, I'm not that much of a movie guy, but I definitely like Nicholas Cage acting. I'm going to watch that movie and tell you my thoughts about it. Nice meeting you!
>
> Clara: Your quote made me laugh!! Also thanks for sharing the song I really enjoyed it :)
> Evelyn: Ayy fellow Psych student :) Freud definitely said that (Peer reviewed et al., 2022)

We observed students who wrote more detailed introductions and interacted more frequently on peers' profiles were reciprocated with more engagements around their own profiles. The ongoing expressions of the students dialectically maintain and incrementally transform the digital social space and inform further practice. This give-and-take dynamic underscores the responsibility of teachers to promote an inclusive, active culture of performance through customisations of the technology and role-modelling for participation (Hulett, 2019) to legitimise the expected practices that are not always evident in how the digital tools are intuitively designed to operate. Students also added to their profiles throughout the programme as they collaborated further, including sharing contact information and social media coordinates that signalled an openness to forge more permanent connections with peers, showing the iterative layering of collective social capital.

We also asked students to create 1-minute "The Day in the Life" digital video vignettes as a methodology for reflecting on the well-being practices embedded within the mundanity of their daily lives (Heinrichs et al., 2023). These short videos, created by 18 students, tapped into students' digital consumption and production habits with Snapchat, Instagram Stories and TikTok and expressions through music, framing, memes and humour. These artefacts extended the social authenticity to the students' lives by showcasing how their quotidian practices, influenced by their cultural and ethnic dispositions, interact with the presiding milieu. The internationalisation of education means that online exchanges are not necessarily about local-to-local student interactions among exchanging institutions but the increasing possibility of encountering international students from home – which was undoubtedly the case in this course. Many international students studying in Australia who participated felt compelled to assert their cultural identities by intermixing local practices with their home culture's artefacts and practices into their videos, including forms of dance, music, food and traditional song and dance. As one of the Australian international students remarked:

> It is helpful to consider my identity to retrieve my confidence as [I] belong to my home country [and] culture.

In contrast, the homology between the local milieu and dispositions of local Hong Kong and Australian students did not provoke the need to emphasise intercultural practices. Instead, they tended to highlight conventional daily practices around nourishment, mobility, exercise, appreciation of nature, studying, hobbies, relationships, and rest or relaxation. Nonetheless, there was no doubt that the activity enabled students to find commonalities, as one student reflected:

> When we were watching those videos, I feel like actually many students, they have some something pretty much in common… we can actually see our resemblance like [in] all of us… it's actually like mutual connection to me.

Ambiguities and conflicts

Bourdieu (1999) pointed to the development of "practical analysis" through experiences of marginalisation and tension. Ambiguity is relational, cultural and contextual (Kelly, 2023); hence, intercultural exchanges are ideal sites for ambiguity that permit interrogating the taken-for-granted (Leask, 2015). This disrupts the presuppositions of the habituated for otherness to emerge and move towards a more nuanced understanding of their self- and other-identities through reflexive orientations. They can be generative for transdisciplinary crossings by opening students to multiple or divergent rather than fixed interpretations (Orr & Shreeve, 2017) and foster cognitive and behavioural flexibility in collaboration.

An activity we introduced to provoke critical inquiry and the influence of background on their dispositions was a privilege walk exercise using Miro to support a spatial visualisation of the students' positions. Teachers asked questions about students' socioeconomic and ethnic backgrounds, and students moved forwards or backwards along a horizontal axis based on scores corresponding to the possession or absence of these attributes. The exercise explored the concept of intersectionality, symbolic power (e.g., ethnic privilege, recognition, prestige) and its impact on individual and collective well-being. A student remarked on how it awakened her understanding of how "privileges [were] unconsciously based on my background", while another student from Hong Kong expressed how he felt conflicted because the exercise had "certain motive behind it...trying to make you feel you're privileged". He reflected on the nuances of privilege and the relational nature of intersectionality, challenging the categories and questions presented in the exercise across different sociocultural contexts – an awareness of the relationality across cultures. Students reflected how "intersectionality and sense of identity…can affect well-being" but also how:

> [The exercise] taught me about how complex someone's identity can be and how it can affect well-being. Also learning about intersectionality helps me realise about privilege that I have and don't have and try to think what can I do about it.

These digitally mediated cross-contextual conversations to establish dissensus allow the taking of ambiguous positions, as one student reflected:

> One of the most important things was how many different perspectives/ experiences there are of things, and while you may not agree or relate to them, it doesn't make them "wrong".

In another instance, a student analysed the gratefulness diary exercise (shared on Notion) for their group's research question and was surprised by the diversity of perceptions and framing of well-being among students from disparate and analogous backgrounds. The student reflected on how "everyone's feeling is so different and unique that I may not totally understand" and how attempting to focus on commonalities might not be productive. Yet, in another example, participants working on the research questions acknowledged similarities in how university students attended to their own well-being. Nevertheless, they realised how contextual factors of Australia's abundant horizontal open spaces versus Hong Kong's compact urban verticality enabled or constrained decisions for mundane well-being practices and influenced relatability. These conflicts enabled learning spaces for students to embrace ambiguity by simultaneously holding and appreciating competing views towards the same problem. Active

conversations with plural viewpoints in the diverse workshop activities and dialogues with peers supported this liminality in becoming more reflexive and activating critical perspectives:

> I loved the interactive conversations during the weekly sessions. It exposed me to a lot of new and different viewpoints, which ultimately made me question a lot of things and grow as an individual.

Beyond cross-cultural conversations and activities, multimedia digital tools established conditions for students to engage in more open-ended group exercises. Storytelling and visual methodologies using digital applications to broaden expressive options overcame the difficulties of articulating the multifaceted aspects of well-being, which can be very personal, dispositionally embodied and unconscious (Bourdieu, 1977; Sweetman, 2009). Sweetman insisted these visual methodologies can be transformative and develop critical self-awareness. For example, students participated in a body-mapping exercise to create a metaphorical body map of their peers. To do this, students had to exercise empathy and translate the bodily sensations associated with supporting their peer's well-being into the medium of collage, illustration, images and writing using Canva. Another task entailed constructing a collective identity diagram through the same process on Canva but collaboratively reimagining how their campus life optimised well-being. Students engaged in combinatory play using photographs, campus maps, illustration images and text to express notions of friendships, nourishment, multiculturalism, respect and acceptance, prayer, safety and the physical environment for student well-being to flourish. Participation in re-storying as a narrative method asked groups to critique traditional fairy tales and rewrite the story from alternative perspectives, including different actors, presuppositions, themes and contexts. The exercise aimed to help students evaluate the familiar and orthodox by recognising the arbitrariness of social relations and collectively experimenting with recomposing new possibilities. A group of students reflected on their re-storying attempt by stating "that this is [not] how it should have happened, but there's no reason why it couldn't have happened".

These cross-cultural and semi-structured exercises encourage students to seek consensus or how to move past dissensus, facilitating the exploration of ideas, encouraging students to advocate their perspectives, and comparing their views and approaches. We aimed to have students go beyond transactional and pragmatic engagements typical in interactions via digital channels towards developing a history of interdependent learning experiences. These exercises promoted open sharing and off-topic personal exchanges, moving discussions from task-based to social-based. The gradual layering of the cultural with the social reinforces Hou et al.'s (2015) contention that divergences from tasks to personal conversations should be encouraged because it enables shared notions that constitute community. Giving more time for in-between moments to happen can prompt authentic and improvisatory interactions, offer a passage towards trust and sow enduring connections that transcend the programme's scope. As Jenkins (2006, p. 42) explained vis-a-vis Bourdieu's theory of practice, "improvisation is the exploitation of pause, interval, and indecision".

However, not all conflicts were explicitly due to intercultural differences but instead rooted in digital collaboration and communication challenges. In the post-evaluative survey, collaboration was voiced as the most challenging aspect of the programme. Leibinger and Toland (2023) showed that the withdrawal of students from programme participation was viewed negatively because it added to the workload of students staying in the programme. Other difficulties stated by students included the difficulty in remote digital communication, mainly facilitated through Zoom, instant messaging apps (WhatsApp, Discord), and email, although feedback overwhelmingly listed communication skills as the top learning from the programme. Although students acknowledged the social connections that can be forged through online interactions, physical distance prevented a deeper bonding with their overseas peers:

> One challenge that I encountered was that the exchange was virtual, and I couldn't really talk to the other participants in person. Even though we could share great conversations with one another virtually, the barrier posed by the physical distance was what kept us apart and we weren't really able to get to know the others in-depth.

In-person physical exchanges make it easier to reproduce patterns of doing and speaking that can minimise unconscious social distance for bonding. Repetitive and informal chit-chat, small-talk and non-verbal interactions that arise from in-between and mundane moments such as travelling, waiting and eating are not immediately available for students in VEs. Paradoxically, there was still a strong consensus among the students, indicating the collaborative component was their most enjoyable experience. Online collaboration requires a distinctive rhythm, as its improvisational practice occurs at a different pace and space. Still, students found it meaningful to engage collectively in various creative tasks and the common purpose of pursuing the group's research and establishing friendships with peers through weekly meetings. Another student observed the inherent challenge of online interactions in thoroughly assessing the relative competencies of peers, an understanding which might have augmented collaborative dynamics:

> Due to the programme and project being held virtually, it was challenging to collaborate with peers whose strengths and weaknesses were relatively unknown. However, that is an essential skill in the today's world and I believe came out better equipped to work with new people after this.

Rather than negatively interpreting the challenges to the online format, the disjunctive condition activated the student's reflexivity around how online exchanges fostered valued dispositions and accrued requisite capabilities in meeting the demands of contemporary workplaces. Another student who remained in the programme despite an increased workload exacerbated by peers who withdrew reflected on how this adversity provoked her to practice and develop her organisational and planning skills. The observation points to the tacit willingness of many students to overlook the inherent limitations of VEs and how digital-induced challenges can stimulate beneficial responses from students.

The intercultural in the transdisciplinary

So far, we have illustrated how digital mediation can cultivate fertile grounds for the exchange of intercultural understandings and embodied knowledge to emerge. Now, we argue how this is a precondition for transdisciplinarity, which requires students to hold an open and inclusive dispositional imagination of what research is and can be, including diverse and non-conventional concepts and methodologies. Our programme introduced students to various research methodologies for well-being, including multiple validated survey instruments in psychological, autoethnographic biographies, literary re-storying and narrative approaches, Indigenous Australian storytelling practices of "yarning" and visual arts and digital data analysis. However, putting aside disciplinary inclinations is difficult, as these are sometimes recorded in the habitus and presupposed as "common sense" in the fields that students inhabit. We can observe glimpses into aspects of the research that challenge different students. For example, a few students struggled to imagine beyond their parochial understanding of what constitutes "research". Predominantly, there were evident preconceived notions of research as confined to laboratory work or scientific methods, especially among those with backgrounds in the sciences and quantitative fields who expressed discomfort with the subjective nature inherent in more qualitative research traditions and insufficient sample sizes to make generalisations.

Quite a few students mentioned the value of learning to "extract" and "analyse qualitative data". A psychology major student was dispositionally resistant to using qualitative data in his research, objecting in a group work session about how he felt the data was not "objective" enough. The student attempted to collect quantitative survey data to supplement the research but found it not helpful in answering his questions about social media use and well-being. In the end, the diverse disciplinary backgrounds of his peers and encountered challenges transformed his deeply ingrained notions to reflect on how other students drew inferences from qualitative data:

> So yeah, for us, because we came from quite statistical quantitative backgrounds, it was a bit difficult for us to grasp at first with the qualitative data. And we still tried to, like force our way through and combine the both. And in the end, it didn't really work.

In contrast, there was no mention from students concerning the scientific validity of quantitative methods, and most student groups included some form of statistical analysis in their research outputs. As one student put it, "qualitative research [was] not something typically covered at university – there's more emphasis on conducting quantitative research". As statistics courses are mandatory across most university degrees, quantitative methods are implicitly considered more scientifically valid, marginalising other interpretative research methodologies.

The project encouraged students to generate original knowledge and insights as social actors. The diversity of digitally mediated exercises and multimodal channels for expression urged students to bring their tacit knowledge from lived experiences and that of peers into the research process, legitimising their capacities to perform research and produce knowledge. A student shared how digitally "putting a personal face and expressing my view on well-being issues [allowed them] to develop a more sophisticated understanding" of the issue from an international perspective. Other students remarked on the programme as follows:

> It gave me a broader framework to look at my well-being such that it becomes easier for me to point out what is wrong with my life, why do i feel such way.
>
> Learning to listen to your body, appreciating and living in the present and recognising the ways different aspects of your identity interact and co-exist.

As teachers, we purposely minimised intervening in the students' research to maximise autonomy so as not to predetermine outcomes. This stance probably explains why some students indicated the need for more guidance in the research process, indicating our need to balance the support provided. However, other students expressed positive reflections on their participation in the programme and their ability to make original contributions:

> I really enjoyed working with the Australian as well as other Hong Kong students in conceptualising a new well-being framework through the lens of intersectionality! I felt really proud of myself and my group members after generating new and hopefully useful knowledge!
>
> I enjoy how this inquiry-based exchange builds my research skills through exploring the topic of well-being across Hong Kong and Australia [context with] groupmates who conduct collaborative research to make a creative and original contribution to the study of student well-being with me!

Eight out of nine student groups completed an original research report addressing their research questions around university student well-being and orally presented this at a final dissemination session. The overall research outputs of the students affirmed their willingness to experiment despite sometimes struggling to interpret and make sense of the eclectic mixed data sets. Many students positively mentioned "research skill" and "broader frameworks to look at well-being" as critical learnings of the project. A student group successfully published and disseminated at an academic conference dedicated to equity practitioners in the tertiary education sector with their student-led reconceptualised framework of student well-being within universities from the lens of intersectionality. The experience was highly encouraging for the participating students from the three universities, testifying to students' capacity to contribute to producing "legitimate" knowledge for real-world problems.

Conclusion

Digitally mediated online international exchanges offer a promising pedagogical pathway for developing students' intercultural capacities and transdisciplinary learning and research skills for knowledge generation. By mobilising Bourdieu's (1977, 1984) concepts of field and habitus, we demonstrate how well-designed digital learning environments, grounded in clear pedagogical intent, can create conditions

for individual and collective improvisatory and performative practices. These practices operate non-deterministic ways and socialise the digital space as a site for intercultural and collaborative exchange and endeavours. Our experimentations across three participating universities underscore the value of digital technologies in educational contexts – not only for fostering collaborative and communicative competencies, as validated by existing literature, but also for enabling transdisciplinary education, which relies on a network of connections for problem framing, co-creation practices, intercultural dialogue and collaborative inquiry that remain open to ontological possibilities and differences.

The value and versatility of multimodal digital technologies in intercultural educational exchange contexts, constituted by students' cross-cultural and embodied perspectives, can create third spaces that promote encounters of tension, ambiguity and conflict. These disjunctures can trigger the development of reflexive capabilities for epistemic and ontological pluralism (including expanding the research imaginations) necessary for transdisciplinary inquiry and knowledge production. Hence, the paper offers a practical and methodological contribution that complements the extensive theoretical groundwork of transdisciplinary education within higher education, highlighting how the digital and intercultural are necessary for transversality.

Although our case study is limited in generalisability, we hope it may inform and inspire practitioners and administrators to consider integrating COIL and VE projects into their courses, programmes or co-curriculum. This form of inquiry-based pedagogy supports teachers' responsibilities in expanding accessibility for students through multiple frames of reference and multimodal, reflective and playful channels for individual and collective expressions and the intentional adaption of digital technology as participatory platforms that leverage valuable intercultural and transdisciplinary exchanges. Moreover, transdisciplinary experiments in education may pave avenues for reimagining learning that embrace students as constructors, conductors, and contesters of knowledge. By addressing the urgency to relinquish the deeply entrenched neoliberal logic of students as consumers, we can signal more inspirational visions of possibilities for contributions that recognise our ecological entanglements.

Author contributions

Jack Tsao: Conceptualisation, Data curation, Investigation, Writing – original draft, Writing – review and editing; **Sakinah Alhadad:** Investigation, Writing – review and editing; **Danielle Heinrichs:** Data curation, Investigation, Formal analysis, Writing – review and editing; **Suraiya Abdul Hameed:** Investigation, Writing – review and editing; **Kate McLay:** Investigation, Writing – review and editing.

Acknowledgements

We are indebted to the anonymous reviewers and associate editor for their critiques and recommendations, which assisted us in refining this paper. This study was funded by the Hong Kong University Grant Committee's Teaching Development and Language Enhancement Grant, under the project titled Future Readiness: Leadership, Work & Global Citizenship, awarded by the Office of the Vice-President and Pro-Vice-Chancellor (Teaching and Learning) at the University of Hong Kong.

References

Barrett, T. (2015). Storying Bourdieu: Fragments toward a Bourdieusian approach to "life histories". *International Journal of Qualitative Methods*, *14*(5). https://doi.org/10.1177/1609406915621399

Bourdieu, P. (1977). *Outline of a theory of practice* (R. Nice, Trans.). Cambridge University Press.

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*. Harvard University Press.

Bourdieu, P. (1990a). *In other words : Essays towards a reflexive sociology*. Stanford University Press.

Bourdieu, P. (1990b). *The logic of practice*. Polity Press.

Bourdieu, P. (1999). The contradictions of inheritance. In P. Bourdieu (Ed.), *The weight of the world: social suffering in contemporary society* (pp. 507–513). Stanford University Press.

Bourdieu, P., & Wacquant, L. J. D. (1992). *An invitation to reflexive sociology*. Polity Press.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Buchmüller, S., Malhotra, S., & Bath, C. (2021). Learning how to engage with another's point of view by intercultural, interdisciplinary and transdisciplinary collaborations. *Journal of University Teaching & Learning Practice*, *18*(7), 89–111. https://open-publishing.org/journals/index.php/jutlp/article/view/522/522

Corbin, J. M., & Strauss, A. L. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). SAGE. https://doi.org/10.4135/9781452230153

de Wit, H., & Hunter, F. (2015). The future of internationalisation of higher education in Europe. *International Higher Education, 83*, 2–3. https://doi.org/10.6017/ihe.2015.83.9073

Duffy, L. N., Stone, G. A., Townsend, J., & Cathey, J. (2022). Rethinking curriculum internationalisation: Virtual exchange as a means to attaining global competencies, developing critical thinking, and experiencing transformative learning. *Schole : A Journal of Leisure Studies and Recreation Education*, *37*(1-2), 11–25. https://doi.org/10.1080/1937156X.2020.1760749

Fawns, T. (2022). An entangled pedagogy: Looking beyond the pedagogy-technology dichotomy. *Postdigital Science and Education*, *4*, 711–728. https://doi.org/10.1007/s42438-022-00302-7

Garcia, F., Smith, S. R., Burger, A., & Helms, M. (2023). Increasing global mindset through collaborative online international learning (COIL): Internationalising the undergraduate international business class. *Journal of International Education in Business*, *16*(2), 184–203. https://doi.org/10.1108/JIEB-08-2022-0054

Guattari, F. (2015). Transdisciplinarity must become transversality. *Theory, Culture & Society*, *32*(5-6), 131–137. https://doi.org/10.1177/0263276415597045

Hackett, S., Janssen, J., Beach, P., Perreault, M., Beelen, J., & van Tartwijk, J. (2023). The effectiveness of collaborative online international learning (COIL) on intercultural competence development in higher education. *International Journal of Educational Technology in Higher Education*, *20*, Article 5. https://doi.org/10.1186/s41239-022-00373-3

Heinrichs, D. H., Hameed, S., Tsao, J., McLay, K., Nguyen, H., & Alhadad, S. (2023). Mundane matters: Entangling moments of student wellbeing across cultures, time, space, and virtual worlds. *Critical Studies in Education*, *65*(3), 235–255. https://doi.org/10.1080/17508487.2023.2252469

Hou, H.-T., Wang, S.-M., Lin, P.-C., & Chang, K.-E. (2015). Exploring the learner's knowledge construction and cognitive patterns of different asynchronous platforms: Comparison of an online discussion forum and Facebook. *Innovations in Education and Teaching International*, *52*(6), 610–620. https://doi.org/10.1080/14703297.2013.847381

Hulett, K. H. (2023, May 27). Community from a distance: Building a sense of belonging in an online classroom. *The Scholarly Teacher*. https://www.scholarlyteacher.com/post/community-from-a-distance-building-a-sense-of-belonging-in-an-online-classroom

Jenkins, R. (2006). *Pierre Bourdieu*. Routledge. https://doi.org/10.4324/9780203131527

Kelly, V. (2023). Embracing a pedagogy of ambiguity in higher education. In M. J. Lehtonen, T. Kauppinen, & L. Sivula (Eds.), *Design education across disciplines: Transformative learning experiences for the 21st century* (pp. 71–89). Springer. https://doi.org/10.1007/978-3-031-23152-0_5

Klein, J. T. (1994, November 2–6). *Notes toward a social epistemology of transdisciplinarity* [Conference presentation]. First World Congress on Transdisciplinarity, Convento da Arrábida, Portugal.

Larsen, A., & Emmett, S. (2023). The wicked problem of social equity in higher education: The conflicting discourses and the impact of COVID-19. In S. Weuffen, J. Burke, M. Plunkett, A. Goriss-Hunter, & S. Emmett (Eds.), *Inclusion, equity, diversity, and social justice in education* (pp. 29–42). Springer. https://doi.org/10.1007/978-981-19-5008-7_3

Leask, B. (2015). *Internationalizing the curriculum*. Routledge. https://doi.org/10.4324/9781315716954

Lee, J., Leibowitz, J., & Rezek, J. (2022). The impact of international virtual exchange on participation in education abroad. *Journal of Studies in International Education*, *26*(2), 202–221. https://doi.org/10.1177/10283153211052777

Leibinger, M., & Toland, A. R. (2023). Facilitating international transdisciplinary collaboration in a virtual academic exchange project. In J. Domenech, D. M. Álvarez-Hevia, A. Martínez-Varea, R. M. Llácer-Iglesias, & D. Brunetto (Eds.), *Proceedings of the 9th International Conference on Higher Education Advances* (pp. 221–228). Universitat Politècnica de València. http://doi.org/10.4995/HEAd23.2023.16276

Lenkaitis, C. A., & Loranc, B. (2022). The role of intercultural virtual exchanges in global citizenship development. *Journal of International and Intercultural Communication*, *15*(2), 222–234. https://doi.org/10.1080/17513057.2021.1876241

Lodge, J. M., Alhadad, S. S. J., Lewis, M. J., & Gašević, D. (2017). Inferring learning from big data: The importance of a transdisciplinary and multidimensional approach. *Technology, Knowledge and Learning*, *22*(3), 385–400. https://doi.org/10.1007/s10758-017-9330-3

Max-Neef, M. A. (2005). Foundations of transdisciplinarity. *Ecological Economics*, *53*(1), 5–16. https://doi.org/10.1016/j.ecolecon.2005.01.014

Naicker, A., Singh, E., & van Genugten, T. (2022). Collaborative online international learning (COIL): Preparedness and experiences of South African students. *Innovations in Education and Teaching International*, *59*(5), 499–510. https://doi.org/10.1080/14703297.2021.1895867

Nicolescu, B. (2002). *Manifesto of transdisciplinarity* (K.-C. Voss, Trans.). State University of New York Press.

Nicolescu, B. (2018). The transdisciplinary evolution of the university condition for sustainable development. In L. Neuhauser, D. Fam, & P. Gibbs (Eds.), *Transdisciplinary theory, practice and education: The art of collaborative research and collective learning* (pp. 73–81). Springer. https://doi.org/10.1007/978-3-319-93743-4_6

Orr, S., & Shreeve, A. (2017). *Art and design pedagogy in higher education: Knowledge, values and ambiguity in the creative curriculum.* Routledge. https://doi.org/10.4324/9781315415130

Pohl, C., & Hirsch Hadorn, G. (2007). *Principles for designing transdisciplinary research*. Oekom. https://doi.org/10.14512/9783962388638

Rezapour, M., Dehzangi, A., & Saadati, F. (2022). Students' negative emotions and their rational and irrational behaviors during COVID-19 outbreak. *PloS One*, *17*(3), e0264985. https://doi.org/10.1371/journal.pone.0264985

Richardson, S. (2016). *Cosmopolitan learning for a global era: Higher education in an interconnected world*. Routledge. https://doi.org/10.4324/9781315871004

Rigolot, C. (2020). Transdisciplinarity as a discipline and a way of being: Complementarities and creative tensions. *Humanities & Social Sciences Communications*, *7*, Article 100. https://doi.org/10.1057/s41599-020-00598-5

Rubin, J., & Guth, S. (2023). *The guide to COIL virtual exchange: Implementing, growing, and sustaining collaborative online international learning*. Routledge. https://doi.org/10.4324/9781003447832

Scott, D. (2017). Interdisciplinarity, transdisciplinarity and the higher education curriculum. In P. Gibbs (Ed.), *Transdisciplinary higher education: A theoretical basis revealed in practice* (pp. 31–43). Springer. https://doi.org/10.1007/978-3-319-56185-1_3

Sierra, J., Yassim, M., & Suárez-Collado, Á. (2022). Together we can: enhancing key 21st-century skills with international virtual exchange. *Education & Training*, *64*(6), 826–843. https://doi.org/10.1108/ET-05-2021-0171

Southworth, J., Migliaccio, K., Glover, J., Glover, J. N., Reed, D., McCarty, C., Brendemuhl, J., & Thomas, A. (2023). Developing a model for AI across the curriculum: Transforming the higher education landscape via innovation in AI literacy. *Computers and Education: Artificial Intelligence*, *4*, Article 100127. https://doi.org/10.1016/j.caeai.2023.100127

State University New York. (n.d.). *What is COIL?* Retrieved February 28, 2022, from https://online.suny.edu/introtocoil/suny-coil-what-is/

Sweetman, P. (2009). Revealing habitus, illuminating practice: Bourdieu, photography and visual methods. *The Sociological Review*, *57*(3), 491–511. https://doi.org/10.1111/j.1467-954X.2009.01851.x

Thomas, L., Herbert, J., & Teras, M. (2014). A sense of belonging to enhance participation, success and retention in online programs. *The International Journal of the First Year in Higher Education*, *5*(2), 69–80. https://doi.org/10.5204/intjfyhe.v5i2.233

Wacquant, L. J. D. (1989). Towards a reflexive sociology: A workshop with Pierre Bourdieu. *Sociological Theory*, *7*(1), 26–63. https://doi.org/10.2307/202061

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE.

Zhang, J., Sokol, M., Hnatiuk, T. V., & Boyer, C. (2023). Time zones, pandemic, and war, oh my! The challenges of conducting an international virtual exchange. *Curriculum and Teaching Dialogue*, *25*(1-2), 309–313.

Corresponding author: Jack Tsao, jtsao@hku.hk

Copyright: Articles published in the *Australasian Journal of Educational Technology* (AJET) are available under Creative Commons Attribution Non-Commercial No Derivatives Licence (CC BY-NC-ND 4.0). Authors retain copyright in their work and grant AJET right of first publication under CC BY-NC-ND 4.0.

Please cite as: Tsao, J., Alhadad, S., Heinrichs, D., Hameed, S. A., & McLay, K. (2025). The digital-intercultural-transdisciplinary nexus: Online international exchanges for transdisciplinary education. *Australasian Journal of Educational Technology*, *41*(1), 27–41. https://doi.org/10.14742/ajet.9620