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new vistas

Policy, Practice and Scholarship in Higher Education

New Vistas | Policy, Practice and Scholarship in Higher Education

EDITOR'S NOTE

Volume 7 | Issue 1

As an optimist, I find myself imagining a brighter, better future. But it has been hard to remain optimistic over the last 12 months. Luckily, the UK Government has decided that one route towards a brighter future is to ensure freedom of speech through the appointment of a new Free Speech Champion. The current education secretary, Gavin Williamson, announced that this role is needed to stamp out unlawful 'silencing' on campuses. So, let me exercise some of this free speech.

Covid-19 has had a devastating impact and the UK Government's ineptitude has cost the lives of thousands. Brexit has stopped goods from reaching the supermarkets of Northern Ireland and threatened peace. Government trade deals suggest a watering down of regulation and the possibility of low-quality food. Our planet is heating, but targets to address the climate catastrophe lack political direction. Government ministers have denied hungry children a free school meal and will soon cause thousands of families to sink below the poverty line by withdrawing the meagre £20 uplift in Universal Credit. Nurses are superheroes yet they are offered a 'pay rise' that will see them lose money in real terms. Institutional racism continues its ignorant journey, yet Government ministers deny its very existence. Children are literally dying because of poor air quality, yet the Government still embraces the stink of oil, coal and gas.

We are on the tipping point, but my optimism leads me to believe we will tip in the right direction. Now, more than ever, the free voice of Higher Education needs to be heard. As ever, the authors in this edition of *New Vistas* have stood up and offered comment that seeks to move the conversation forward. We open with Thompson and Bell discussing the impact of Covid-19 on a teaching exchange programme. Further discussion on Covid-19 then follows as Sikora and Pace examine their experiences of blended synchronous learning and Karimi reflects on researching school leadership in the time of Covid-19. Our fourth article shifts the narrative slightly as Grendele addresses the challenge of recruiting participants from 'hard-to-reach' communities. This is followed by an analysis by van der Sluis of the relevance of manga, graphic novels, and comics in diversifying curricula. Breakspear and Cachia then offer a thoughtful account of students' perceptions of loneliness at university. In our final article Butcher *et al* look at how individual differences in students (motivation, self-regulation and feedback orientation) impact on them completing academic tasks. We then close on an optimistic note, with a profile of PhD student, Livia Lantini, and her work on disease control in trees and forests around the world.

As we look to a brighter future, safe in the knowledge that our right to free speech will be maintained, let's not just go back to our old ways – let's build a brighter future based on research, efficacy and a desire to make life better. Let us use our voices.

Dr Erik Blair
New Vistas Editor

MISSON STATEMENT

***New Vistas* is published by the University of West London (UWL) and provides a forum to disseminate research, commentary, and scholarly work that engages with the complex agenda of higher education in its local, national and global context.**

Published twice a year (with occasional special issues), for a broad (academic, international and professional) audience, the journal will feature research and scholarly analysis on higher education policy; current issues in higher education; higher education pedagogy; professional practice; the relation of higher education to work and the economy; and discipline-specific research.

We welcome thought-provoking scholarly contributions from external and internal authors, with the explicit intention to give a voice to early-career researchers and scholars.

Email: newvistas@uwl.ac.uk
Twitter: @newvistas_uwl
Web: https://uwlpress.uwl.ac.uk/newvistas/

University of West London
St. Mary's Road, Ealing, London W5 5RF

Design and Art Direction
Jebens Design – www.jebensdesign.co.uk

Cover Photography
Claire Williams Photography – www.clairewilliamsphotography.co.uk

New Vistas | Policy, Practice and Scholarship in Higher Education

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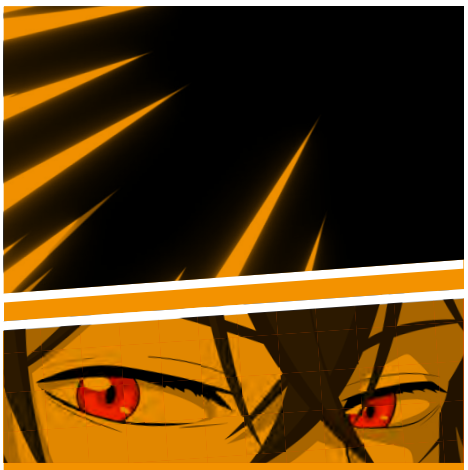


Andrew D. Thompson | Anglia Ruskin University,UK
Adrian Bell | University of West London, UK

THE COVID CRISIS – 'ACADEMIC FIREFIGHTING'

Teaching exchange programmes involving United Kingdom Higher Education delivered in the People's Republic of China were directly impacted by Covid-19, requiring the immediate adoption of alternative plans of delivery for both teaching and assessment. In examining the impact, this reflective analysis suggests a global crisis the educational world becomes a smaller more unified place of collective cross border experience.

> ***"In Chinese, the word for disaster also means opportunity"***
> *Petty, 2009*

Facing the crisis – Immediate adaption required

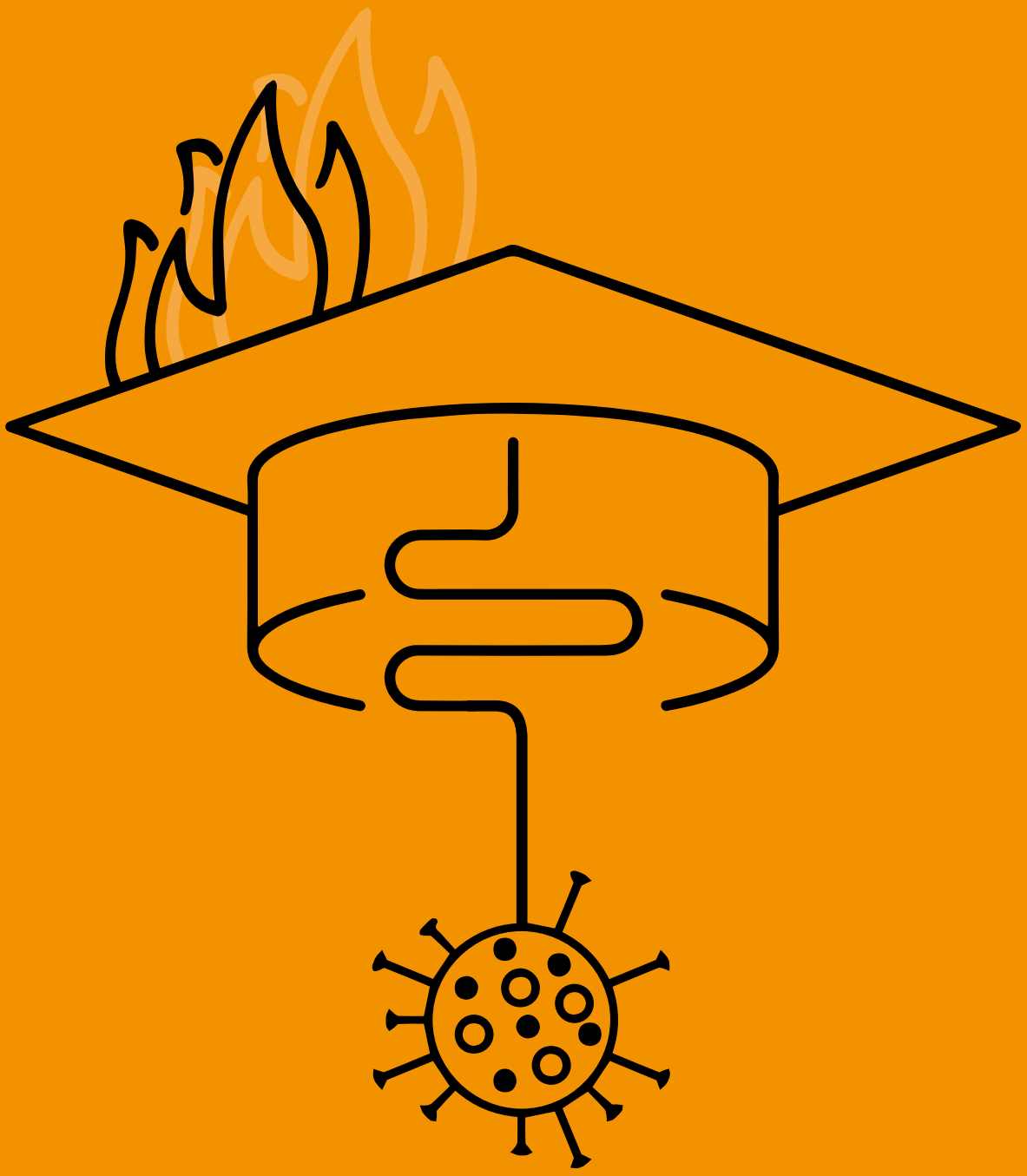
This article seeks to document the reflective practice of two experienced Chartered Surveyor practitioner/educators lecturing on built environment modules within a Higher Education teaching exchange. The built environment degree courses of Anglia Ruskin University, a United Kingdom (UK) Higher Education provider, are delivered under an exchange programme with East China Jiaotong University, located in Nanchang in the People's Republic of China. In the pre Covid-19 world these modules were delivered in both the UK and China through face-to-face teaching. Teaching in China involved an intense block learning approach over a two-week period, whereas the modules were taught in the UK through weekly lectures spread across a 12-week trimester. The intensity of the block teaching in China was such that course design and delivery required a high level of preparation and a consideration of the needs of students and practitioners in order to maintain enthusiasm (Thompson, 2013). This is rapid 'standards-driven' delivery model was planned for maximum short-term educational impact with little space left to nurture the longer life skills of 'Slow Education' (van der Sluis, 2020). As an external 'flown in' educator you sought to plant a seed during the intense block teaching and hoped that others in the local institution would help nurture, feed, and support it to flourish. Having established multiple deliveries of the module with successful assessment outcomes through the face-to-face block teaching, the Covid-19 crisis caused a change of approach.

The events of the Covid-19 pandemic, leading to global lockdown, impacted both the UK delivery model and the international travel associated with the China exchange such that the established delivery plan would not be possible. This required a fundamental reassessment of the delivery plan and an examination of whether an already intense face-to-face delivery model could be successfully redesigned for online teaching. Online immediate adaption thinking was therefore necessary. A flexible, pragmatic approach was required to encourage the students, nurture a positive learning environment, and seek to provide reassurance that, in crisis, education can continue.

Research aims and objectives

Our aim here is to reflect on the lived experience of teaching during a period of global crisis with the objective of:

- Reviewing the theory that had underpinned the decision making of our practice which had shaped the adjustments from a face-to-face model to the emergency online structure.
- Using the toolkit of critical reflection, undertake a structured review of our practice and the emergency delivery plan.
- Provide the foundations for the next phase of teaching to both our UK and Chinese students.



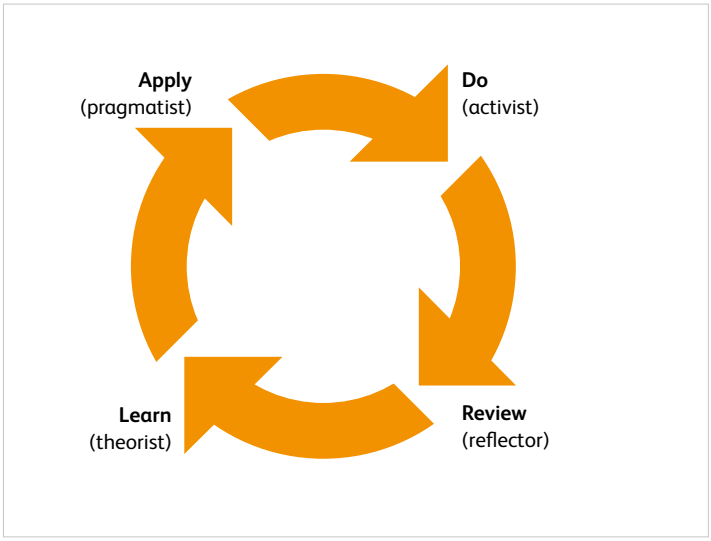


FIGURE 1 Kolb's Cycle (Petty, 2009)

The theoretical framework

The basis of this reflective assessment uses a combination of tools drawn from soft system methodology (SSM) (Checkland, 1981) in conjunction with group collective memory. This was combined with Bolton and Delderfield's (2015) methodology of '*writing as reflection*' following the **EDAR** model of **E**xperience → **D**escribe → **A**nalyse → **R**evise (Gravells, 2012). This combined approach provided a flexible means to create the holistic recollection of experience. The positioning of the researcher as an insider within the system under assessment is acceptable in this type of educational research as:

> *The idea of the insider-researcher reflecting upon their own practice and that of others, formulating research questions and testing everyday assumptions is the core of the reflective practitioner tradition and can provide work-based researchers with a useful theoretical lens through which research observation and analysis can be viewed…* (Costley, Elliott & Gibbs, 2013)

The classic four stages of the SSM learning cycle approach are also aligned to the sequencing of the educational design process when compared to the stages of the Kolb Cycle (see figure 1).

The challenges and pressures of Covid-19 hitting the Higher Education sector created a unique set of circumstances such that recording the strategies and reflections of practitioners seeking to deal with this crisis is felt a worthy endeavour. Being worthy however still comes with complexity when dealing with a retrospective event. Our original approach, when engaged in the firefight of the crisis, was never planned as a research project, the luxury and formality of research stages such as literature reviews, pilot studies and design testing did not factor in the purest context. This type of 'after the fact' research is an approach that is open to potential disadvantages due to the lack of a predesigned methodology. However, in the context of the lived experience the pressure and magnitude of global events were such that the normality of planning a research project within such a crisis would have been impractical. This is therefore the reflections of educational firefighters who have faced the heat of the crisis.

Immediate adjustments during the teaching

We developed a plan for delivery and were ready to teach; however, mindful of the military wisdom that *"No plan survives contact with the enemy"* (Barnett,1963), it would be folly to suggest our concept of a strategy did not need immediate and flexible adjustment. Essentially, harnessing technology was the key issue, in order to achieve the desired outcomes. The events required good preparation and the ability to remain patient, pragmatic and flexible to needs of the students.

Whilst we had organised our materials in advance and ensured that there was a Module Study Guide with clear assessments and marking schemes, further explanation and briefing were required, and the anonymous wisdom of *'tell the audience what you're going to say, say it; then tell them what you've said'* became a vital teaching strategy. Our teaching communication was easily achieved via an app called 'WeChat'. As teachers we were able to communicate with the organisers (Chinese academic colleagues, and the real stars of this story) and our Student Monitors. Student Monitors in Chinese education help teachers organise the materials and communicate with the group. By using WeChat they made our Orwellian *'Big Brother'* '*Face on a Screen*' become human. Our Student Monitors were in the class doing all the 'leg work' and were given deserved respect. The Student Monitors were an essential 'lynchpin' communicating to the group in Chinese and liaising English instructions from the lecturers.

It should be noted that the programme is delivered in China in the English language.

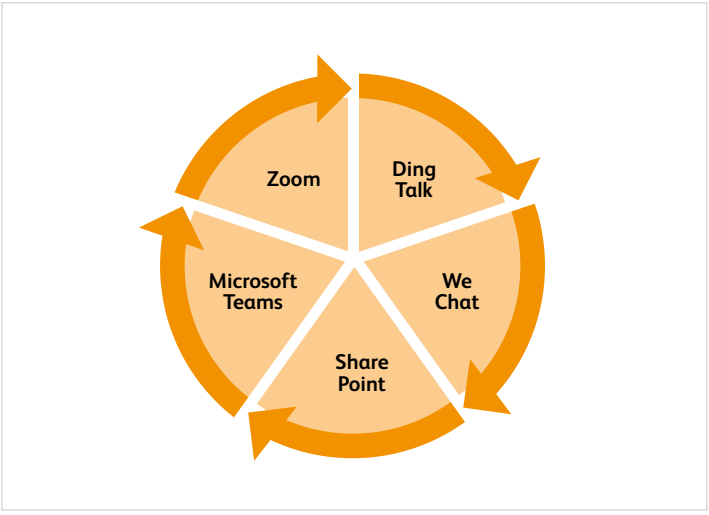


FIGURE 2 Technologies used

As a technical course it was anticipated that minor communication language barriers might arise in the terminology of expressions used in professional/business technical communication. We facilitated and resolved this with the help of the Student Monitors who were comfortable using technology such as app-based translation tools and were able to look up advanced terminology using a reference text. Our use of 'SharePoint' enabled the students to access the materials and upload their presentations with relative simplicity. The online platforms made the geographical difference an irrelevance in the UK to China comparison.

Both the UK and China courses had an assessment based on a group presentation of a technical problem task. This software was Microsoft PowerPoint with the quality and delivery being identical between UK and China groups. Interestingly, the Chinese students appeared to enjoy the chance to practise speaking in technical English which cannot always be stated in equal terms for our UK students who appeared to focus on the negative challenge of public speaking rather than the opportunity to practice. Lectures were delivered using Zoom.

Feedback from the Chinese students helped develop better technical solutions to facilitate the viewing of the presentations, such as viewing the faces of those who were presenting. This feedback was obtained through 360° class discussion and encouragement of a quality control feedback approach. This empowered the ownership of the whole experience to be a collective journey of 'we' – working together and seeking to obtain the best educational solution. The students suggested using an app called 'Ding Talk'. This app enabled students to work remotely on their group presentation. Our need to be culturally mature – with trust in the professionalism and work ethic of our students was rewarded. This is an example of the Chinese students taking ownership and responsibility for the quality and professionalism of the delivery and the presentation. When a similar approach was suggested to UK students using non-university software for course work the cultural shift was drastic. UK students immediately voiced that this was a 'university' problem and that acknowledgement of less than perfect delivery was grounds for seeking an extension or appeal.

The Chinese students were able to deliver the group presentation virtually, with identical technical professional quality as that of the students. The combination of WeChat, SharePoint, Zoom and Ding Talk creating an online learning experience that enabled students to achieve equitable results in both the UK and Chinese group presentations. This online teaching immediate adaption also led to practitioners developing new training skills as they moved from a face-to-face delivery to an online environment. See Figure 2 for a summary of the technologies used.

Conclusions and recommendations

Online teaching is our new normal and the distinction between 'traditional' and 'online' educators has now been removed. In the 'new normal' every educator needs to be equipped and skilled in both face-to-face and online practices and should be able to switch between the two forms with little warning. However, such practices should be examined against the higher academic goal of planting the seeds for critical reflection, and approaches such as 'slow education' (van der Sluis, 2020) must remain a core part of our educational thinking. It is suspected that, in the very near future, the distinction between the two will disappear as student will demand the best of all experiences. For this, new entrants into Higher Education teaching will need to be confident in a variety of both face-to-face and online approaches. Luckily, as a new generation of students convert to educators they will emerge with the requisite skills, having been taught during a period of crisis.

In the depth of Covid-19 crisis, the requirement to adopt an online teaching immediate adaption approach was a challenge. Using a combination of technological tools, significant results were achieved. Students were able to adapt easily, with a can-do team approach producing significant team results. Fear, uncertainty, and the complexity of the challenge created by Covid-19 existed for both UK and Chinese student groupings. When faced with equal challenge the positive professional response of the East China Jiaotong University students, in particular, was a credit to them and their university. Further work may be required to examine the cultural significance of the two student groups and how they approached the various challenges encountered.

As practitioner/academics this reflective exercise has been an attempt to establish the basis for more specialised educational researchers to challenge, evolve and take forward the observations this paper has attempted to document. This is a practitioner experience record, as such we accept all the errors, weaknesses and pitfalls of our actions in a time of global crisis. It is however our belief that micro gains will build the collective move forward so as a community we need to record the living record of these global events as they were experienced. This needs a forgiving stance accepting of the research methodology weaknesses that a planned more considered exercise could have observed. It is now for future educationalists to assess the merits of our crisis delivery, but they are reminded of the words of Samuel Becket (1983): *"Ever tried. Ever failed. No matter. Try Again. Fail Again. Fail Better."*

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About the authors

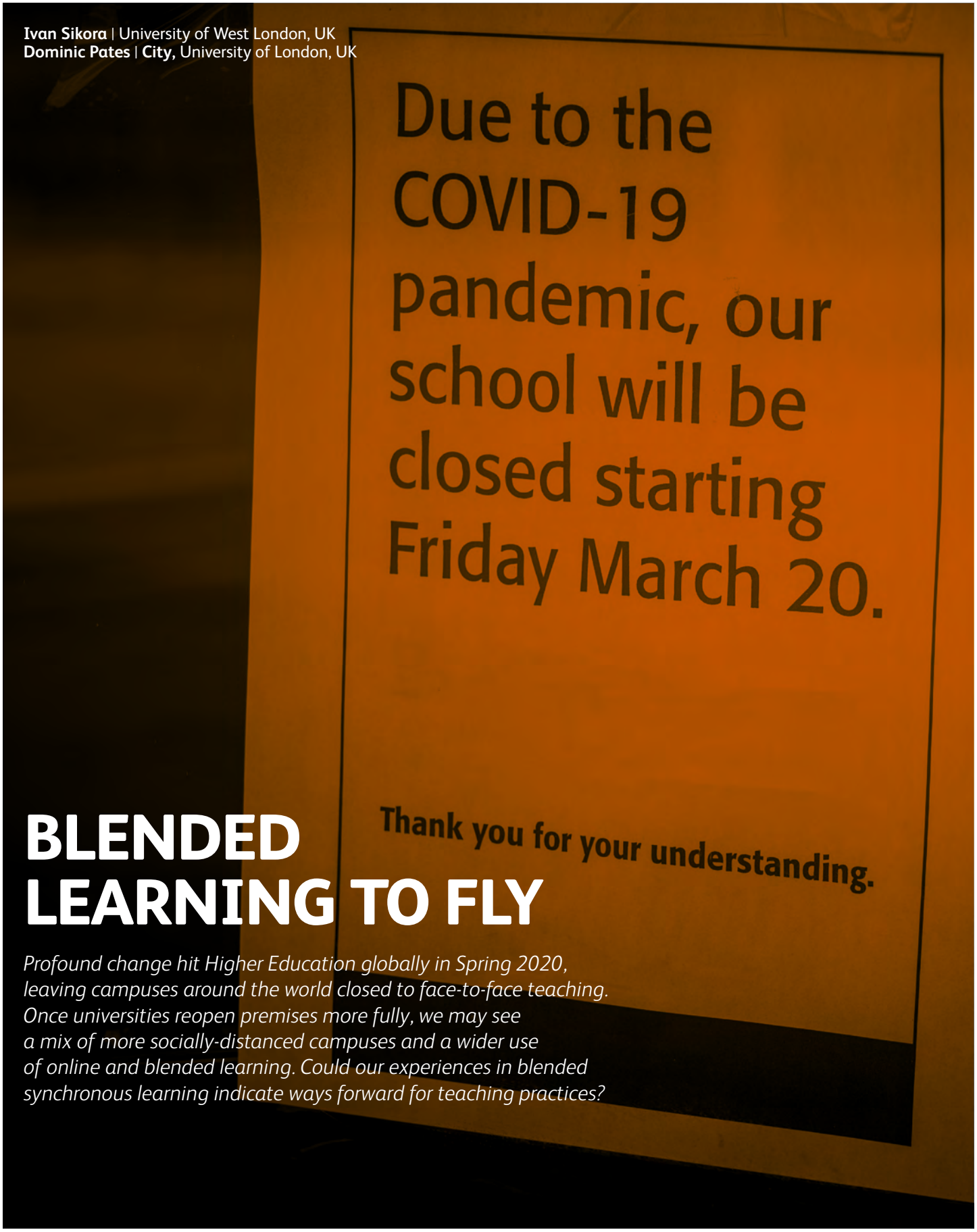
Andrew D. Thompson, Senior Lecturer in Building Surveying, Anglia Ruskin University; Adrian Bell, Lecturer in Building Surveying, University of West London

Keywords

Covid-19, online teaching, crisis, reflective practice, sustainable development, China

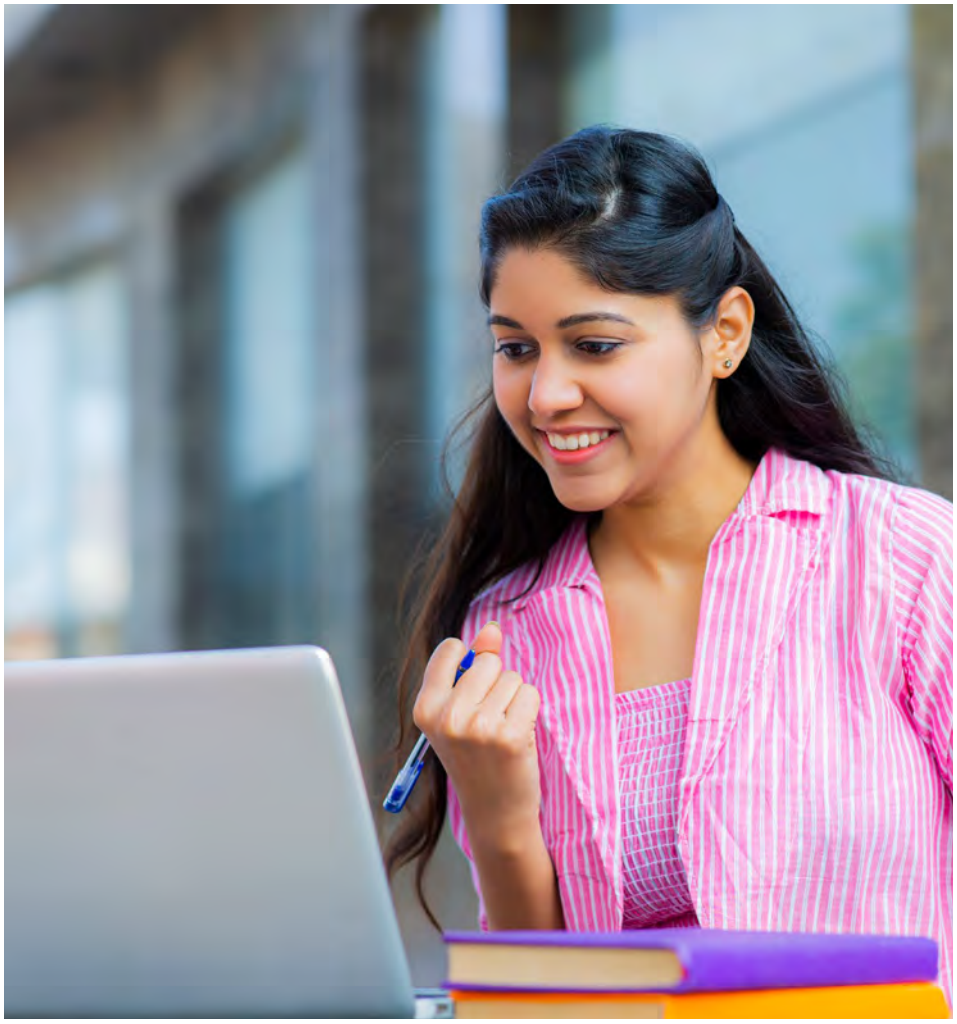
Fear, uncertainty, and the complexity of the challenge created by Covid-19 existed for both UK and Chinese student groupings. When faced with equal challenge the positive professional response of the East China Jiaotong University students, in particular, was a credit to them and their university

Ivan Sikora | University of West London, UK
Dominic Pates | **City**, University of London, UK



BLENDED LEARNING TO FLY

Profound change hit Higher Education globally in Spring 2020, leaving campuses around the world closed to face-to-face teaching. Once universities reopen premises more fully, we may see a mix of more socially-distanced campuses and a wider use of online and blended learning. Could our experiences in blended synchronous learning indicate ways forward for teaching practices?



An educational earthquake

In March 2020, an earthquake hit much of global Higher Education. Unlike the tectonic rupturing of a geological earthquake, the physical ground beneath Higher Education institutions (HEIs) did not actually break up nor did buildings come down. As the COVID-19 pandemic spread around the world, large numbers of HEIs were forced to switch their teaching operations to online modes of delivery at very short notice (McCarthy, 2020). While many institutions had been exploring forms of online delivery for several years and innovations such as the Massive Open Online Course (MOOC) had long been considered as disruptive to the enduring model of Higher Education (Shirky, 2012), this lockdown seemed to have forced what we might characterise as a sudden 'Great Onlining' on a sector that has sometimes been thought of as embracing change at an almost glacial pace (Barber, 2013).

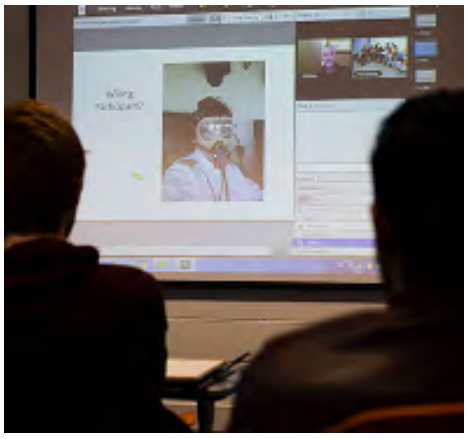
Even in the immediate face of this tectonic shift, some recognised that the pandemic would force massive changes in all aspects of human behaviour and interactions. In the early stages of the pandemic, Litchfield (2020) suggested that '[t]his isn't a temporary disruption. It's the start of a completely different way of life.' As with many other HEIs, in our institutions – University of West London (UWL) and City, University of London (City) – academics found themselves forced to shift delivery of the remainder of the academic year completely online. This meant the rapid adoption of systems and approaches that were unfamiliar to most, and even providing steep learning curves for those with some working familiarity with educational technologies. For many academics, this meant transferring existing practices into alternative and online-only formats. The Great Onlining was just as disruptive for students, many of whom found themselves having to complete their studies in profoundly compromised circumstances. Many were confronted with having to learn new systems and ways of studying online, while facing practical challenges such as appropriate access to technology or a suitable place to study. Others faced impacts on their general wellbeing, confidence or motivation, and general circumstances of uncertainty (Jackson, 2020).

This paper, however, begins not with lockdown narratives but with a look back over the past few years to lessons learned from a particular set of educational experiments in what we are referring to as 'blended synchronous learning', in order to ask what salience these experiences might have for today and for post-pandemic teaching futures in Higher Education.

On blended synchronous learning

Between mid-2016 and late 2017, we ran a project that we named, *Learning to Fly*. On three separate occasions over this period, we brought a Subject Matter Expert (SME) guest speaker into an undergraduate seminar within a module on '*Aircraft Reliability and Safety*'. The students were located in London, while the SME appeared live in their class via web conferencing tools from Auckland, New Zealand. For this project, we took an iterative approach to designing a learning experience, with each session learning from, and building on, the previous one.

While this initiative was new for us in our own practice, we were building on what others had done before us. Hastie *et al's* (2010) Blended Synchronous Learning Model takes five basic elements (physical and virtual classrooms, teachers, students and the number of possible participants in a physical or a virtual space) and describes nine possible operating modes. Blended Synchronous Learning (BSL) mode 6 of this model consists of teachers participating in both physical and virtual classrooms, and students participating in physical classrooms. Hastie et al's BSL mode 9 consisted of teachers and students both simultaneously participating in physical and virtual classrooms, suggesting that this was the 'most holistic mode' in their model (ibid, 2010, p.17) and that mode 9 had the potential to become a mainstream approach for successful universities in the future. In mode 9, also seen as the most flexible, both teachers and students were free to choose which environment they wished to participate in, and multi-institutional collaboration across the world would become possible. BSL mode 9 was considered most effective when both teachers and students had prior experience of BSL. With *Learning to Fly*, we unknowingly started with BSL mode 6 and, by the third iteration, had moved to a limited version of mode 9. As the initial lockdowns of 2020 began easing and universities found themselves grappling with what an educational offer would look like 'after the quake', we returned to *Learning to Fly* and found ourselves asking whether what we found during that project had relevance for how Higher Education could operate in a time of COVID-19.



Planning, design and delivery

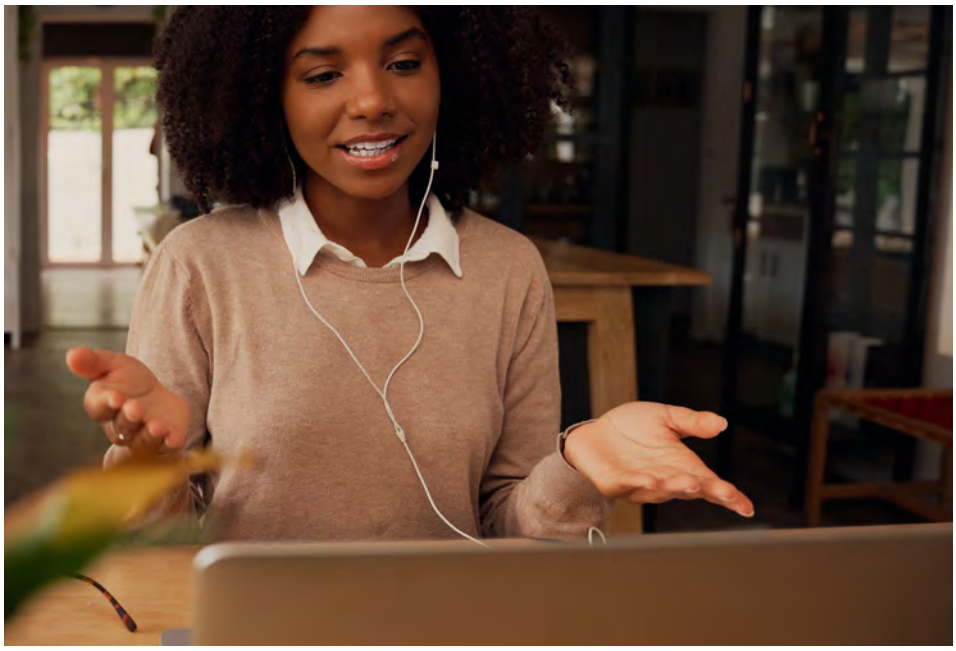
Beyond the technical facilitation of the idea, our primary aim was to be able to create a set of conditions that would allow the students to be as fully engaged in the learning experience as possible, rather than being distracted by the means through which their guest speaker was brought into their class. This meant attempting to lower or remove any of the barriers to participation, whether they were in physical or virtual space, and to therefore allow the session to have its own sense of flow.

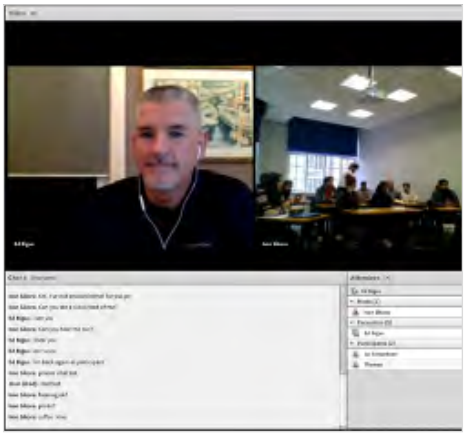
Csikszentmihalyi (1990) theorised that people are at their happiest when they are in what he described as 'a state of flow', where through intense focus and full engagement, an individual is fully immersed in an activity. Akin to feeling as if one is 'in the zone', Csikszentmihalyi's flow state includes such elements as clear goals every step of the way, a balance between challenges and skills, distractions being subconsciously excluded, and the activity becoming an end in itself. In order to achieve it, there must be a balance between the skill of the performer and the challenge of the task. Engendering a sense of flow can, of course, be considered from a range of different perspectives in a teaching and learning context, including pedagogical, spatial and technical aspects. Attempting to attain a degree of flow state for participation in these sessions was a key design goal for *Learning to Fly*.

In our experience, an effective BSL session was more likely to achieve a degree of flow when a moderator/producer was present during the delivery. We find a fitting parallel here with aviation where having a person to manage power and fuel flow is essential for the flight but will likely go unnoticed by the end user of the service. A 'spotter' or 'wingman' in a BSL session takes tasks such as monitoring the chat channel and selecting questions, or advancing pre-designed layouts of a web conferencing system, allowing the main presenter to focus on the primary task in the same way that a flight engineer would once have supported a pilot in the cockpit while they navigate the flight path and communicate with ground staff.

Learning to Fly was run another two times after the first iteration, with each session building on the previous one. For the second iteration, we reviewed the session plan and divided the lecture into two parts, both to aid with student attention and to incorporate a group task in the middle of the talk. We booked a flexible learning space, which contained moulded plastic chairs on castors that enabled students to easily reconfigure the room layout themselves in order to fit into the webcam field of vision rather than be constrained by fixed seating or furniture that was difficult to move. We also incorporated the Adobe Connect mobile app, so that students were provided with an additional channel for asking text-based questions as they thought of them rather than saving them up till the end of a talk. For the third iteration, we gave the students a set of pre-tasks in advance, to get them thinking on-task prior to the session and we themed all activities around employability (a key performance indicator for many universities). We also introduced a CatchBox, a throwable wireless mic contained in a foam cube that was used by both in-class-teacher and all students for picking up their voices. This was the first session where one of the students also joined us online rather than in the room, thus serving as an example of BSL mode 9.

Csikszentmihalyi theorised that people are at their happiest when they are in what he described as 'a state of flow', where through intense focus and full engagement, an individual is fully immersed in an activity





The students in these two sessions commented positively on the multi-modal design of the learning experience, on the ability to question and get first-hand information from an active practitioner in the field, and on gaining insights into how the industry worked; thus, connecting the theory of their lectures to practice

Evaluation and reflections

With each iteration, we gathered primary data on the effectiveness of the session. For the first and second ones, our SME completed a short survey that asked a standard set of questions, gathered free text responses from the students during the sessions using the Poll Everywhere mobile response app, and solicited written feedback from the Educational Technologists who viewed the sessions online. We reviewed the third session via a focus group with participating students.

For sessions one and two, our SME felt fully prepared, found the stages of the session and the on-screen layout of each stage clear, well-designed and in an appropriate order. He found the experience positive each time with the technical provision easy to use, but was less certain about how engaged he felt with the students, even though a camera feed from the room in London to pick up his student audience was included in the onscreen layout of the online platform. He also noted the challenge of the significant time difference, which was a fairly early morning for the students and a late evening for him. This was a constraint that we had little choice but to work with given the large time difference but we used his written feedback to design in more interaction with the students, including breaking up the presentation into stages.

The students in these two sessions commented positively on the multi-modal design of the learning experience, on the ability to question and get first-hand information from an active practitioner in the field, and on gaining insights into how the industry worked; thus, connecting the theory of their lectures to practice. They provided constructive feedback on the need for some kind of on-screen 'laser' pointer for the SME to indicate which parts of a photograph or diagram he was referring to, and were similarly challenged by the early start of the sessions. Insights generated from the focus group after the third session included the following comments:

I felt confident enough to ... interrupt with my points.

It was quite easy to follow and also for the Q&A, the [throwable] microphone helped a lot because that's one of the biggest concerns.

Obviously, it's better to have a live lecture, but sometimes people are around the world. Using these technologies, basically it's the closest thing to a live lecture.

An Educational Technologist colleague picked up on a moment when the mic wasn't used in the physical classroom and so couldn't be heard by any remote participants, and made a recommendation for an early opening of the text chat channel, in order for the remote participant(s) to be able to provide feedback on sound levels to the facilitators. The quality of the balance of audio levels was also picked up in colleague feedback from the second session, along with praise for the consideration of the on-screen layout templates that marked different stages and the addition of a camera feed from the room. He also recommended providing some basic instructions for online participants on the welcome slide, but stated that, *'it felt much more personal than a usual webinar'*.

Higher Education teaching in a time of COVID-19

Three years after we introduced *Learning to Fly*, COVID-19 led to Higher Education campus lockdowns. City went into lockdown with Connect as the incumbent video conference platform, but subsequently found much synchronous teaching and learning activity moving towards newer platforms such as Microsoft Teams and Zoom. Although

UWL used Blackboard Collaborate Ultra, which may have made the institution slightly better placed for coping with the immediate shift of teaching activity to a synchronous platform

Teams/Zoom were clearly not designed for primarily educational contexts, they at least appeared to be technically robust and mobile friendly – a major factor for providing educational continuity in emergency circumstances. UWL used Blackboard Collaborate Ultra, which may have made the institution slightly better placed for coping with the immediate shift of teaching activity to a synchronous platform.

The London Higher umbrella body of universities and colleges in London lists over 40 institutions as members or partners, including City and UWL, and therefore clearly represents a significant number of academic staff and students. In July 2020, London Higher (2020) released the 'COVID-19 Secure Charter', which set out ten key principles that institutions were working on in order to show how HEIs in London were implementing safety measures for the coming academic year beyond the Spring 2020 lockdown phase. Aside from pandemic-related health and safety measures, examples of these principles included supporting staff and students with access to 'online provisions to enable them to perform to their best abilities and enjoy a richer digital experience' and committing HEIs to offering 'a combination of online and face-to-face solutions to working and learning' (ibid).

How can this large population conduct 'business as usual' in a transformed world, where close human contact is routinely and systematically avoided? As we anticipated and have observed in our own institutions now that a new academic year is underway, two key components of the pandemic-driven continuity of Higher Education have been 'the socially-distanced campus' and far greater online activity than would once have been the case. A 'socially-distanced campus' is clearly unlike the pre-pandemic buzz of an active term-time university. Guidelines of one or two metres distance from others significantly reduce seating capacity in learning spaces such as lecture theatres. For those staff and students located within 'COVID-19 Secure' spaces, measures in addition to physical distancing include perspex face visors, face masks, large quantities of hand sanitiser, armies of cleaners, one-way systems, staggered timetables to avoid any kind of clustering of people, and lecturers being issued with individual microphones to avoid sharing resources. Such sterile environments might be COVID-secure, but they do not appear particularly conducive to active learning practices, and it is harder to provide a standard approach for the spatial needs of particular degrees, such as City's aeronautics laboratory or UWL's kitchens.

As the initial months of teaching under lockdown demonstrated, sudden changes to established practices might be achievable under emergency circumstances, but ensuring a high quality educational experience without precedents to draw on or without thoroughly evaluating such changes makes it very difficult to judge the effectiveness or impact of changes made. What is clear, however, is that the enforced lockdown has had a significant impact on traditional face-to-face teaching practices.

Embedding the 'Great Onlining'

Salmon (2020) discussed strategic 'design then deliver' stages of a curricula planning process, noting that multi-stakeholder co-design teams are effective for covering the first design stage, but that the delivery stage, in the example of teaching fully online, requires quite a different skillset from lecturing. Salmon also suggests that successful online learning experiences are mainly asynchronous, and for delivery, a mindset shift from academic 'contact hours' to students' 'total study hours' is necessary. White (2020) preferred the notion of 'presence' over contact hours, which redefines teaching activity towards the extent that a member of teaching staff is or feels present and in what mode – a helpful concept as we reconsider notions of engagement. Lefevre (2020) also considered strategic stages, defining them as stabilise, enhance and innovate for supporting moves towards more online practices. Stabilise consisted of the immediate pivot to online methods in the face of challenges such as lockdown. Enhance is the challenge that Salmon also referred to, the rapid design, development and implementation of online courses to make the move 'beyond video conferencing' (ibid, 2020). Innovate recommended institutions have teams that can think ahead, about how the values

and mission of a university can be effectively expressed online for inspiring and empowering students in the years to come.

Czerniewicz (2020) recounted lessons learned when South Africa's Higher Education sector experienced periods of university shutdowns that resulted in enforced moves to teaching online. Their lessons from the significant upscaling of online delivery were manifold, and remind us that there are also considerable political dimensions to large scale and permanent moves towards online education that must be addressed in parallel with other challenges around learning design, digital capabilities for staff and students, and institutional capacities

Blended synchronous learning and the new HE

Given the wholescale increase in online teaching and learning, we revisited our recommendations from *Learning to Fly* for any value they might bring to those new to attempting forms of BSL. These recommendations appear to be as fitting for post-lockdown environments as they were in the pre-COVID age:

1. **Test, test and test again.** There are many components to a BSL session, and teachers, with support staff, testing all aspects of these approaches, particularly for those new to the practice, is vital to develop working familiarity with the separate components.
2. **Raise the student voice in the mix.** While lower-quality video experiences can generally be forgiven in synchronous online learning environments, poor or intermittent audio is less-easily forgiven. Find a means of effectively bringing the student voice into the mix, with spoken voice as the priority, but written input via text chat as well.
3. **Don't let the technology become the focus.** To achieve better flow in a session, teachers should try to make whatever technologies used seem as close to invisible as possible.
4. **Build rapport between participants.** This is a key role for the facilitator (who may not be the teacher), and includes ensuring platform familiarisation for all participants, and connecting remote speakers with students.
5. **Break long presentations up into chunks.** This allows speakers a break and students time to digest any lecture material.
6. **Record the event.** This is for post-session review by students that attended and access for those that couldn't attend at the time.
7. **Have a 'co-pilot' in the main room.** A facilitator enables the teacher to focus on their primary teaching activities and keeps the session on track.
8. **Enable students to submit text-based comments and questions.** This provides a means for students to submit questions via text, such as a chat function, at any point during presentation.
9. **Make the event as interactive as possible.** Interactivity is a key component of active learning, and BSL works best when it is learner-centred.
10. **Get feedback from all participants.** This helps find out how it went and how it could be improved.

Blended Synchronous Learning can be a complex and challenging way of teaching and learning that is time and resource intensive and it can be cognitively demanding for both teacher and student. Easy access to digital tools such as video conferencing platforms does not necessarily make this an easy educational approach to take. However, as our experiences have shown and our guidelines indicate, with sufficient preparation, equipment and an appropriate setting of expectations, BSL can bring significant advantages to a variety of educational contexts. In a time of ongoing uncertainty for Higher Education, BSL also suggests opportunities and possibilities for post-pandemic teaching and learning practices. This paper recounts our experiences in working together at one institution, which demonstrated the potential of this approach. We aim to follow this project by collecting more primary data from others who have experienced forms of BSL, in order to widen the understanding of the potential and challenges of this approach in Higher Education. Perhaps BSL could afford more resilience in our sector before the next earthquake hits.

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About the authors

Ivan Sikora, Associate Professor in Aviation & Tourism, University of West London, UK; Dominic Pates, Senior Educational Technologist at City, University of London, UK

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Hengameh (Sarah) Karimi | PhD student, University of West London, UK

RESEARCHING SCHOOL LEADERSHIP IN THE TIME OF COVID-19

As a PhD researcher conducting educational research in schools, I thought I'd take this opportunity to emphasise the importance of research in our schools and share the impact of Covid-19 on my doctoral research.

The importance of research in schools

Research is too often seen as an academic activity conducted by others and is not always seen as a concept respected by managers, practitioners, and policymakers. But perhaps it should be. Indeed, I believe that educational professionals are always learning, exploring, analysing information, adapting their behaviours according to what they receive and looking for improvement; therefore, critical enquiry is a key component of education. All of this is research whether they want to call it that or not. But have you ever imagined the world of education without research? If education is not based upon research and evidence, then, if there is no underpinning research base, on what would the teaching and learning experience be based? Education without research runs the risk to being based upon one or more of the followings: dogma, theory, ideology, convenience, and prejudice (Field, 2011). Education is a political football and can be used for political purposes; however, for those involved in teaching, educational leadership, and educational research, there is also a moral obligation which means it is wrong to follow dogma blindly. Education should serve, liberate and promote equality of opportunity and democracy. Likewise, following an ideology can be dangerous. Teachers have a social responsibility to develop active citizens. To follow an ideological route to guide one's practice restricts choice, which is the opposite of the real purpose of education. Also, basing our practice solely on our own learning experiences without reflection, means putting education at risk of being outdated and not being forward looking.

Theories come and go, and no single theory can function on its own. Learners and learning are complex, and success is always influenced by other factors including family background, social background, age, gender, personality, location and so forth. Theories need to be combined, tested, and challenged, in order to allow us to adapt to suit local and personal environments. Research enables us to challenge the established system and potential political biases and base decisions upon evidence which is morally sound.

Research can change the system and can impact on the practice of education itself. Research isn't only done on schools – it is also done in schools. According to Mohr *et al.* (2015) research can assist teachers to understand what works and why; what short- and long-term implications there are; provide justifications and rationale for decisions and actions; help to deal with the unexpected, identify problems and drive improvement. When teachers do research, they seek to be rigorous and respectful to the tradition of research; however, their research is not distanced but it is rather passionate about its utility to better shape their own classrooms and to influence others as well. This collaborative knowledge building aims to transform schools from inside out instead of the other way around. Since some educators believe that this is the difference between real or superficial change.

The great importance of research in enhancing the future of education determined my PhD topic. I decided to use case studies from schools (primary phase) in London to discern the relationship between educational leadership and school improvement. My aim was to develop a leadership model for the future best practice in London primary schools. Four case study schools were identified for inclusion in my project. I managed to start my research and two outstanding schools participated from West London – one academy from a multi academy trust and one maintained community-type school. But then Covid-19 changed the educational landscape.

Education should serve, liberate and promote equality of opportunity and democracy. Likewise, following an ideology can be dangerous. Teachers have a social responsibility to develop active citizens

The impact of Covid-19 on the educational landscape

Just as I was trying to find two more schools for my research project, Covid-19 emerged and shut the door firmly. Covid-19 disrupted schooling globally, devastated economic growth, and interrupted international travel. In just a short period of time Covid-19 created undeniable chaos (Hargreaves & Fullan, 2020) – a 'supernova' (Azorin, 2020) shaking the fabric of education. The concept of learning developed a new definition: as a remote, on-screen activity, limiting most learning to a form of online teacher support (Harris & Jones, 2020).

A report by UNESCO indicates that 1.6 billion young people have been out of school during this crisis, and virtually all schools have 'paused' and teaching has been re-organised (Zhao, 2020). In many countries getting children back into school has been an ongoing challenge. Schools that have re-opened have faced issues of social distancing, intensive cleaning and orchestrating all the movement around the school. In the long term, we do not know the impact, effects, and consequences of school closures, but the mental health of young people who isolated at home will be the real issue and has the potential to become a greater problem than the virus itself (Harris & Jones, 2020). Quick solutions are required in a fast-changing world, and the priority should be the well-being of students, teachers, parents, and other stakeholders involved in the reopening of school life.

In addition to the well-being issues caused by Covid-19, this pandemic has also highlighted how education inequity disproportionately affects disadvantaged people in society. For instance, as reported by Darling Hammond (2020), in the USA the pandemic has highlighted disparities in access to digital devices and the internet. When schools were closed,15% of US households and 35% of low-income households with school-age children did not have a high-speed internet connection at home. Similarly, in the UK, Harris and Jones (2020) noted that 1.9 million households have no access to the internet and tens of millions are relying on pay-as-you-go services to get access to healthcare, education, and the online benefits system. A World Bank report (2020) suggests that it is likely that Covid-19 will cause the first increase in global poverty since 1998. Its impacts on young people will be immeasurable, devastating and potentially irreversible.

In regard to education, Covid-19 has changed school leadership practices: considerably and possibly irreversibly. School leaders need new skills in collaboration and partnership with other schools, communicating a longer-term vision, and the ability to share and use new innovations. In other words, collaboration, support, and distributed leadership seem to be the key to survival. As a result of this pandemic, the pressure on school leaders working in these demanding and chaotic circumstances is relentless and the options are limited. Students, teachers and parents are waiting for 'education as usual' and hoping for some continuity, stability, and reassurance. But the stark reality is that this is unlikely to occur anytime soon. Meanwhile, school leaders unwillingly find themselves at a pinch point in the system. They are overly reliant on the guidance about Covid-19 from their government. Simultaneously, they are dealing with a fluid environment and staff situations where they must do much more with much less. Crisis and change managements have become essential skills that school leaders need at this time of turmoil, rather than the routine problem-solving previously needed to run an effective school. Since the speed of change, in this pandemic, is high, a high degree of trust among all stakeholders is required to act as the collective glue and ensure to that issues are addressed as they arise. All of these changes make it more important than ever for educational researchers to develop a good understanding of what is going on in education.

School leaders need new skills in collaboration and partnership with other schools, communicating a longer-term vision, and the ability to share and use new innovations. In other words, collaboration, support, and distributed leadership seem to be the key to survival

Lessons learnt from these troubled times are, as a researcher, it is important to be open to inviting creative practice into our research approach; and great educators are those who can make the complexity of change work in their favour

Educational research and Covid-19

Prior to the Covid-19 pandemic my research was on the principles of good leadership such as having a clear vision, developing others, and building capacity in schools. I intended to contribute a leadership model for future best practice in primary schools. Clearly, Covid-19 caused a shift in my research methodology. Since access to schools and school observations become almost impossible, I had to make changes in the methodological approaches used in my research. Instead of face-to-face interviews and school observations, I decided to explore the role of school leaders in the outstanding journey of schools through the virtual infrastructure of the school websites. As Bennett (2019) asserts, the website not only highlights the school best qualities and show how welcoming the school community is to all stakeholders but it can also effectively communicate the school's vision, mission, the qualities and the offerings to each of the stakeholders. I used interview data collected before the pandemic from the two schools that were doing well (in regards to leadership) as sources to examine the language and content of the websites for schools that have been improved across London.

In conclusion, it seems that it is through research that we best develop our knowledge and understanding. Specifically, cultivating a research-based approach in our educational practices can: assist educators find solutions to particular issues arising in their classroom or school; develop their professional knowledge, skills and understanding; connect educators with sources of information and networks of professional support; encourage them to be more reflective and develop their agency, influence, and self-efficacy within their schools and more widely within the profession. Considering education has always been happening in the context of change, the implications of Covid-19 pandemic on education and research are far from obvious. While teaching and learning has been transformed into a remote and online activity, some school-based research studies have stopped or slowed down. In consequence of this pandemic, participation in research may no longer be a priority for schools and may even be perceived as another burden. The methodology of my research was affected, and it is likely that the methodology of other educational researchers will be too. Being flexible, creative and open to the people in the field helped me to resist the pressure in the journey of my PhD and enabled me to develop the alternative strategy in using the virtual infrastructure of the school websites instead of the face-to-face interviews and school observations. Others will also need to be flexible and creative in order to gain answers to the questions they pose. Overall, the lessons learnt from these troubled times are firstly, research is more than ever required to develop a good understanding of what is going on in education. Secondly, as a researcher, it is important to be open to inviting creative practice into our research approach; and finally, great educators are those who can make the complexity of change work in their favour.

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About the author

Hengameh (Sarah) Karimi is a PhD student in the School of Health and Social Sciences, University of West London, UK.

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School leadership research, Covid-19, school leadership, research students, schools

Windy A. Grendele | University of West London, UK

REACHING 'HARD-TO-REACH' PARTICIPANTS

The recruitment of participants is an important step which contributes to the success of any study involving human participants, but accessing and recruiting prospective participants can be a challenging task. Drawing on direct experience, this article describes the challenges faced and the strategies adopted in order to gain access and recruit members of a gated religious community as research participants. In all, it suggests that transparency in reporting recruitment methods could benefit the research community.

One example of a hard-to-reach group is the gated religious community. These kind of communities are largely under-represented in academic literature. However, despite the difficulty in accessing participants from such 'hard-to-reach' groups, research related to these groups is important, as they are often able to offer direct first-person accounts of activities that can go unobserved by the wider gaze

A successful research and recruitment process

Research is fuelled by the human desire to acquire knowledge and it is the engine of progress for society. Hence, it is appropriate to say that the ultimate object of conducting research is the production of new knowledge. Research is successful when relevant insight is gained, and new knowledge is generated. Nonetheless, the identification of a topic to investigate and the planning of the project are not enough to guarantee the research success. In fact, the production of new knowledge is the result of data analysis, and this data is often gathered from human participants. Although the approach to research and the interaction with participants in the natural sciences and in the social sciences differ, accessing and recruiting participants can be one of the central tasks in the development of research in both fields. Accessing prospective participants, recruiting, and retaining them can determine whether research will achieve its purpose: knowledge-production (Kristensen & Ravn, 2015).

In qualitative research, researchers are interested in selecting individuals with unique characteristics, who are experts in or have experience of the phenomenon under examination. The recruitment process is the initial interchange between the researcher and prospective participants which takes place before participants give their informed consent to be enrolled (Patel, Doku & Tennakoon, 2003). The recruitment process involves different stages: from the identification of an appropriate target group to captivating the interest of potential participants and providing them the necessary information about the nature of the study and their participation (*ibid*). These stages can be challenging, frustrating and time-consuming. However, detailed information about methodological and practical aspects related to the recruitment of participants is often relegated to the backstage, barely addressed or even omitted in most research articles (Deane *et al*., 2019; Kristensen & Ravn, 2015). In this way, important information is not always shared, encumbering the research ideal of transparency.

Recruiting hard-to-reach participants from gated religious communities

Chamberlain and Hodgetts (2018) defined 'hard-to-reach' groups as the portion of a population who, because of their personal circumstances, lifestyle, activities or because of their choice to live separately from the social mainstream are more difficult to access and engage in research. Accessing and recruiting a sample suitable to answer any research question presents some challenges and these challenges are exaggerated in accessing and recruiting people from 'hard-to-reach' groups. One example of a hard-to-reach group is the gated religious community.

These kind of communities are largely under-represented in academic literature. However, despite the difficulty in accessing participants from such 'hard-to-reach' groups, research related to these groups is important, as they are often able to offer direct first-person accounts of activities that can go unobserved by the wider gaze. Their members' direct knowledge and expertise of the subculture they belong to could shed light on practices and phenomenon specific to these communities, filling gaps in our field of understanding. Considering the scarce information in existence about the challenges in gaining access and recruiting participants from gated religious communities, this article aims to extend the academic literature which addresses this issue. This article is based upon my direct experience as a researcher conducting qualitative research on religious shunning in the Jehovah's Witness community.

The research context

Religious shunning remains in force today as an official practice adopted by different religious denominations, especially gated communities, authoritarian groups and cults. The Jehovah's Witness community is an example of a gated religious community which endorses religious shunning as a disciplinary measure, and this community was selected to understand this phenomenon. Religious shunning involves the complete cutting of the social, spiritual and economic ties between a former member and the community (Miller, 1988). The individual may have any contact with their spouse, children, parents, or the possibility of conducting business with members of the community terminated (Back, 2002). Furthermore, the individual may lose their social status and position within the community (Back, 2002; Miller, 1988). Therefore, the study in question was conceived as an exploratory project which sought to provide an understanding of religious shunning in terms of the meaning this has for the people experiencing it and for those who enact it.

Study participants included two groups: those shunned from the Jehovah's Witness community (Group A) as well as those with the authority to shun a member of the community, the Elders (Group B). Once the inclusion criteria had been identified and ethics clearance gained, the recruitment process started. Participants for Group A and Group B were recruited using two forms of purposive sampling: homogeneous and snowball sampling (Farrugia, 2019). Homogeneous sampling aims to select a group of participants

with a similar background or who experienced a similar event. Therefore, a homogenous sample is when the researcher has determined the population of interest very specifically (Dallos & Vetere, 2005). Once the topic of interest has been identified, and the research questions defined, the researcher needs to access the portion of the population which, because of its specific characteristics or traits, could provide a unique insight into the phenomenon explored to address the research questions. For example, homogeneous sampling could be adopted by researchers studying underrepresented sociodemographic groups, such as ethnic or sexual minorities. On the other hand, snowball sampling actively engages participants in the sampling process (Farrugia, 2019). The researcher initially identifies and contacts a few potential respondents who match the study inclusion criteria. They are then asked to recommend others they know who also meet the inclusion criteria. This sampling technique is especially useful when researchers are trying to recruit participants from an elite, a hard-to-reach or hard-to-find population, such as wealthy people, politicians or the homeless (Deane *et al.*, 2019; Chamberlain & Hodgetts, 2018).

The recruitment process of participants for Group A

With prospective participants for Group A, the recruitment proceeded in the following way. After receiving permission from the administrators of several organisations and private peer support groups for former Jehovah's Witnesses on Facebook, an invitation to be involved in the research was posted. Additionally, the call for participants was advertised on Reddit which hosts a large community of former Jehovah's Witnesses. Some administrators and therapists I contacted proactively advertised the invitation on their personal Facebook pages. The request to participate included a brief overview of the purpose of the study, the inclusion criteria, together with my contact details and those of my principal supervisor. Recruited participants were then asked to pass on details of the study to others who may have also wished to take part in.

Participants for Group B: challenges

Far from being an easy task, the recruitment process of participants for Group B, the Elders, required several planning iterations. Given that Jehovah's Witnesses are a gated community, all their efforts are channelled to guarantee a high degree of separateness from what they consider to be the outgroup. "Living in the world without being part of it" (Watchtower Bible and Tract Society, 2012, p.5) is a principle which influences members' interactions with those they consider outsiders. Hence, any interaction with people outside the community is strongly discouraged unless it is related to proselytism (that is, spreading the teachings of their creed in order to make new disciples). Consequently, external invitations to engage in open discussions are seen with suspicion and are often avoided.

The initial recruitment plan for the Group B participants (Elders) was operationalised in the following way. In order to recruit the Elders, who are considered as the spiritual shepherds of the Jehovah's Witness community, a leaflet was produced. The leaflet provided information about myself, my affiliation, my contact details, as well as the reason why I was contacting them. The leaflets were placed in envelopes addressed to the bodies of Elders of the local Jehovah's Witnesses churches. The envelopes were addressed to the

generic 'body of Elders' of each church and not to a specific person because a list of appointed Elders of the Jehovah's Witness community is not publicly available. All the addresses of the Jehovah's Witness churches are listed on the Jehovah's Witnesses' official website (jw.org). After selecting the area of interest, the relevant addresses were identified and twenty envelopes were sent to the local churches.

The reply rate was disappointing. Four bodies of Elders out of twenty replied. Three of them sent an email, and one a text message. All four declined the invitation to be interviewed, suggesting visiting the Jehovah's Witness' website, where sufficient information would be found to answer my questions. At this point a response was prepared and sent. I explained that my main purpose of inviting them to take part was because I was interested in understanding the phenomenon of religious shunning from the perspective of their personal experience as Elders of the community. I pointed out that information on the practice of shunning is limited to the available sources online, much of which is in opinion-based articles. There is no previous research which gives voice to the Elders of the Jehovah's Witness community and sharing their experience would shed more light on this phenomenon.

In trying to build bridges, I explained the research process carefully and said that the questions to be asked would be shared beforehand and the transcript provided for their comments afterwards. I underlined that, as a researcher, I follow the British Psychological Society (BPS) ethical guidelines for research and I provided the BPS link. I reassured them about the protection of participants' anonymity. I underlined that the audio-recorded data, the transcription, and the related documents would be kept private and secure. The audio recording would only be used for the purpose of transcribing and analysing the interview. If any academic publications originated from the research, then only anonymised quotes from the interview would be used. Lastly, I made clear that they had the right to refuse to answer any questions they might consider inappropriate and they had the right to withdraw at any time without giving any reason. This response was sent to them by email in three cases and by letter in one case.

Despite my best efforts to put them at ease, only one body of Elders replied. Part of their response was the following: "Our Elders have reviewed your request. We are not in a position to give a personal view on the subject but to endorse the references provided from our website".

The ideation and operationalisation of new strategies

The possibility of gaining an inside perspective was not looking promising. Nonetheless, I was aware that some members of the peer support groups for former Jehovah's Witnesses, were still part of the community. They define themselves as being PIMO which means being physically in but mentally out. This made me think about the possibility of finding Elders in the same position within the religious community who, because of this, would possibly feel less restrained about sharing their expertise and experience.

I then posted a message on Reddit addressed to the PIMO Elders. Also, I approached the administrator of a peer support group on Facebook and asked if they knew some PIMO Elders I could contact. They knew one. I prepared a letter explaining the purpose for contacting him, and the administrator forwarded my letter to the Elder. The strategy of contacting PIMO Elders on Reddit proved to be the

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most successful and a small group of PIMO Elders replied to my message in private. Despite their interest in the research, they were extremely cautious in interacting with me. In the Jehovah's Witness community, not only are interactions with the outside frowned upon but also it is a step which can have drastic consequences for the individual. Thus, researchers who decide to approach members of gated religious communities will have to deal with members' fear: fear of the consequences of being discovered and labelled as an 'apostate'. An apostate, according to the Jehovah's Witnesses, is a member who defects from the Jehovah's Witnesses' creed. It is someone who speaks out against the Jehovah's Witnesses' teachings, organisation or directives. The fear-feeling is not based on mere threats but on the community's concrete provisions against the transgressor such as being formally shunned and losing everything.

Despite their interest in the research, they [PIMO Elders] were extremely cautious in interacting with me. In the Jehovah's Witness community, not only are interactions with the outside frowned upon but also it is a step which can have drastic consequences for the individual

Dealing with the complexities of gated religious communities

The fear of the PIMO Elders was something tangible during the email exchange we had. Reassuring them about their anonymity being protected at all time was the first step in gaining their trust. Providing my credentials was a second important step. I was transparent about the aim of my research – in order to disperse their doubts about a possible malicious intent from my side in contacting them. I provided them with my university contact details along with my principal supervisor's contact details if they wanted to verify my affiliation.

This stage of the recruitment process required a high degree of understanding, openness and negotiation but the results were worthwhile. Two PIMO Elders agreed to sharing their perspective on the topic. One Elder did not want to schedule a video or audio interview. Instead, he suggested providing written answers to my list of questions. A second Elder agreed to arrange an audio interview. Moreover, two former Elders who resigned from their position contacted me and offered their availability for interview. As with the recruitment of participants for Group A, the role of a gatekeeper was pivotal to the recruitment of participants for Group B. One of the two former Elders who first agreed to take part in the research, contacted other former Elders and eight more individuals agreed to be interviewed.

Four of the participants who agreed to be interviewed preferred to proceed with the camera off, possibly as a precaution to further protect their anonymity. They had stopped preaching and attending the community's meetings, but they had not officially left the Jehovah's Witness community. They had "faded away". Although the leaders of the community increasingly warn members to be careful about maintaining contact, there is no formal shunning for those who fade, and shunning an *inactive* is a matter of personal choice. Therefore, most *inactives* still have their family ties intact. For this reason, their position was as delicate as the position of the PIMO Elders, and their activism against the community is protected by anonymity.

Conclusion

The purpose of this article is to provide an overview of the challenges I faced, and the strategies implemented in recruiting participants from a 'hard-to-reach' group such as the members of a gated religious community. The aim in doing so is to provide useful information about the recruitment process and to enhance methodological transparency. Transparency in research, whether qualitative or quantitative, is fundamental as it lays the foundation for a critical evaluation of the different stages of the inquiry process and findings (Given, 2008). However, sharing the stages of the recruitment process is not only about being methodologically transparent. It is also about strengthening the cooperation within the research community, providing other researchers with useful information and strategies to adopt in order to deal with the complexities of recruiting participants from 'hard-to-reach' groups, such as groups involved in illegal activities like drug dealing, or engaged in socially denigrated practices like sex trade (Chamberlain & Hodgetts, 2018; Benoit *et al*., 2005).

Deane *et al*. (2019) and Samašonok and Leškienė-Hussey (2015) argue that creativity and flexibility are necessary skills for successful professional activities. They allow the individual to solve unexpected problems and to adapt to new situations effectively. Creativity and flexibility proved to be essential in recruiting participants from this gated religious community, and these skills were crucial to overcome the pitfalls of the initial recruitment plan. Creativity and flexibility helped me to focus more on the prospective participants' specific cultural context in order to identify better strategies to reach the target group.

Although this article focuses specifically on the recruitment of participants from a gated religious community, the same strategies can be implemented and adapted by researchers who wish to access and engage participants from other closed groups where an individual's fear of repercussions or stigmatisation could pose a challenge to the recruitment process. Sharing the stages of the recruitment process is about refining the approach to prospective participants, in order to increase the chance of recruiting an appropriate sample. Also, making the recruitment strategies employed more transparent, like this article hopes to do, serves important objectives such as replicability, accountability and effectiveness. It is not always easy to find willing research participants; therefore, it is important for researchers to reflect on the importance of identifying beforehand any possible drawbacks in the recruitment process and for researchers to consider the merits of transparency, creativity and flexibility.

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About the author

Windy A. Grendele, School of Human and Social Sciences, PhD Candidate, University of West London.

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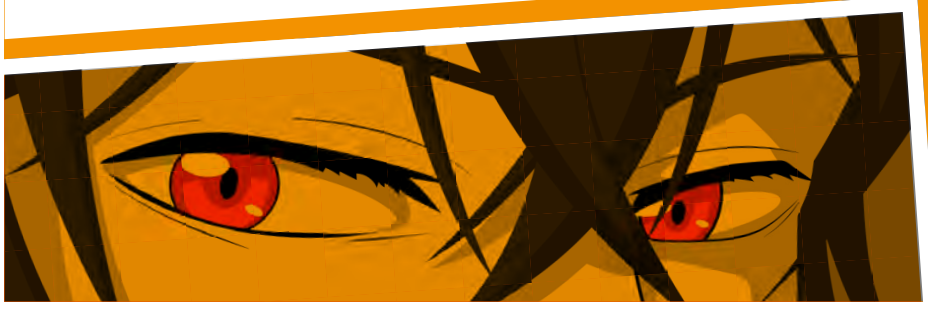
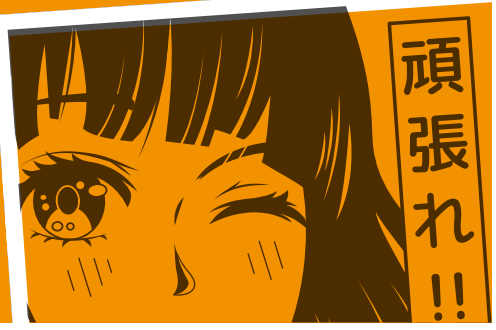
Hendrik van der Sluis | University of West London, UK

MANGA, GRAPHIC NOVELS, AND COMICS IN HIGHER EDUCATION?

Particularly known for playing a key role in the daily entertainment of millions of people worldwide, this article explores the relevance of manga, graphic novels, and comics to diversify curricula and making learning more engaging, and explores why this is of value for Higher Education.





Manga is the name given to comics or graphic novels that originate from Japan. They express a narrative through illustrations, in a sequence of one or more panels, in a non- or semi-realistic style, sometimes in combination with text. The narrative in comics is usually short, light-hearted, and humorous, or satirical in the case of a caricature. As a gross simplification, manga, graphic novels, and comics have for a long time been perceived as primarily for children, while newspaper caricatures have a standing tradition in politics and opinion making, but their main function is to entertain. However, information manga and cartoons are used and designed for the educational setting long before World War II (WWII) (c.f. Friesen, 2013; Humphrey, 2014). This article explores how manga, graphic novels, and cartoons have become relevant for Higher Education (HE) to illustrate, inform, and provoke further thinking.

Manga and graphic novels

The origin of manga, like that of cartoons or graphic novels, is debated and links and similarities have been drawn with predating popular arts or cultures. Manga, like comics, may have emerged as an amalgam of indigenous cultural and graphic narrations, and global influences, but became a uniquely recognisable product and major part of the Japanese publishing industry after WWII. In Japan the manga industry matured alongside the baby boomers, initially focusing on stories and developing themes to fascinate children. As this generation became adults, the manga industry evolved and diversified - where it continued to captivate readers of all ages through a proliferation of genres, topics, and themes, while shedding the prejudgement towards its artistic quality as a mass product (Johnson-Woods, 2010). Similar observations have been made within the European and American context. Arguably, since the turn of the millennium, graphic novels, and comic books have become re-valued by detaching them from moral panics and fears of deteriorating reading abilities. Classics such as *The Adventures of Tintin* by Hergé have become re-appreciated, and new titles become acclaimed for more complex and sophisticated story lines (c.f. MacWilliams, 2008; Babic, 2014).

Manga in particular, plays a significant part in the daily entertainment of millions of Japanese and South Koreans, and translated volumes have become mainstream among children, teens, tweens, and adults in Italy, France, Germany, Spain, North America, and the UK (c.f. Johnson-Woods, 2010). Like other narrative art forms, manga and graphic novels use a variety of practices, styles, and genres to transpose a story line, create suspense and captivate the reader (Johnson-Woods, 2010). Besides entertaining, manga narratives are often written against a more serious background, and the protagonist might for instance explore and discuss romance, sexuality and gender, and raise philosophical questions about identity, intersectionality or their social economic situation (e.g. *Princess Jellyfish* by Akiko Higashimura, or *Ghost in the Shell* by Masamune Shirow); describe careers in corporate cultures (e.g. *Kosaku Shima* by Kenshi Hirokane); investigate and contextualise politics, power, inequality and war (e.g. *Barefoot Gen* by Keiji Nakazawa), or grapple with rapid societal, economical, technological and environmental change (e.g. *Nausicaä of the Valley of the Wind* by Hayao Miyazaki).

Author	Year	Title	Subject
Bargiela, S.	2019	Camouflage: The Hidden Lives of Autistic Women	Psychology
Caplan, B.	2019	Open Borders: The Science and Ethics of Immigration	Sociology
Damour, T. & Burniat, M.	2017	Mysteries of the Quantum Universe	Physics
Farinella, M.	2017	The Senses	Neuroscience
Farinella, M. & Roš, H.	2013	Neurocomic	Neuroscience
Fetter-Vorm, J.	2013	Trinity (history of the first atomic bomb)	History, Physics
Hossler, J.	2007	Optical Allusions	Biology
Ottaviani, J.	2015	Primates (Primatologists: Jane Goodall, Dian Fossey, and Birute Galdikas)	Biology
Ottaviani, J.	20	T-Minus: The Race to the Moon Paperback	History, Space race
Padua, S.	2016	The Thrilling Adventures of Lovelace and Babbage: The (Mostly) True Story of the First Computer	Maths, Computer sciences
Papadatos, A., Kawa, A. & Di Donna, A.	2015	Democracy	Sociology
Wulf, A. & Melcher, L.	2019	The Adventures of Alexander von Humboldt	Natural science

TABLE 1 Selection of graphic novels exploring scientific topics

Manga and graphic novels in education

Because of their popularity, manga and graphic novels have found their way into primary and secondary education and are gaining recognition in academic libraries. Many manga and graphic novels cover topics that are relevant to sociology or history and are written for a mature audience. *Buddha* by Osamu Tezuka or *The 14th Dalai Lama: A Manga Biography* by Tetsu Saiwai are examples of biographies. While, Jacques Tardi's *It Was The War Of The Trenches*, is a series of stories illustrating the horrors of WWI, and *A Jew in Communist Prague* by Vittorio Giardino's explores discrimination and oppression under Stalin. These and many other titles intersect journalism and history, vividly illustrating what it is like to live in different parts of the world, and convey the impact of politics and displacement in ways that other forms of media might not. Other graphic novels explore issues arising from urbanisation, gender, homophobia and identity. Building on the benefits of the medium's multimodality, many American academic libraries have a catalogue of manga and graphic novels to support students' literacy, comprehension, and language development, such as the *Manga Shakespeare* series (c.f. Burger, 2018).

Educational manga and graphic novels are specifically written to inform and educate. Like non-fictional literature, scientific topics, discoveries, historic events and famous scientists are set out in a graphic format and made accessible for a wider audience through a growing catalogue of titles (see Table 1). For instance, Jim Ottaviani has written a number of graphical biographies of physicists and mathematicians like *Niels Bohr* or *Alan Turing*, and paid tribute to female scientists in *Dignifying Science: Stories About Women Scientists*. Others have developed works on specific topics, such as *Evolution* by Jay Hosler, which explores the evolution of life on earth in a graphical and humoristic format. Two other examples that indicate range as well as the intellectual and educational quality are *Logicomix: An Epic Search for Truth* by Apostolos Doxiadis and Christos Papadimitriou, and *Economix: How and Why Our Economy Works (and Doesn't Work)* by Michael Goodwin. Further examples in Table 1 signify the growing opportunities to engage with often complex subjects and fascinating developments, discoveries and individuals in a graphic format, thereby stimulating science literacy among all ages.

Similar to developments in Japan, manga and cartoon drawing have found their way into arts education in America. Building on their popularity, manga have come to play a role in developing students' artistic expression, storytelling and creative writing, and by this means stimulated an interest in arts and graphic design more broadly. As such, manga and graphic novels are considered to play a crucial role in outreach, raising academic aspirations and helping to create a more inclusive and diverse classroom. They stimulate students reading, writing and drawing for pleasure, broaden horizons and encourage an interest in other cultures. Thereby creating opportunities to question students' preconceptions and develop their critical thinking (c.f. Burger, 2018; O'English *et al*., 2006).

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Use of manga, graphic novels and cartoons in Higher Education

The relevance of manga, graphic novels and cartoons for HE is emerging. A growing number of peer-reviewed articles across the disciplines report that activities involving manga, graphic novels, and cartoons stimulate engagement and enjoyment in learning, help students to memorise and clarify key concepts, and stimulate critical thinking. Moreover, manga, graphic novels and cartoon activities have been used to develop professionalism and professional values in, for instance, medical and business education. Table 2 provides an annotated overview of a selection of articles, outlining the disciplinary scope and application of manga activities in HE. The sections below explore activities that can be adopted with relative ease, and discuss why HE students might learn to understand the value of manga, graphic novels and cartoons considering their future professional roles.

Authors	Year	Article	Subject /Discipline	Use in education
Hosler, J. & Boomer, K.B.	2007	Are Comic Books an Effective Way to Engage Nonmajors in Learning and Appreciating Science?	Biology	Scaffolding biological themes about vision and evolution using comic book stories.
Nagata, R.	1999	Learning biochemistry through manga: helping students learn and remember, and making lectures more exciting	Biochemistry	Manga to assist students in understanding biochemistry lectures.
Kumasaki, M., Shoji, T., Wu, T.C., Soontarapa, K., Arai, M., Mizutani, T., Okada, K., Shimizu, Y. & Sugano, Y.	2018	Presenting safety topics using a graphic novel, manga, to effectively teach chemical safety to students in Japan, Taiwan, and Thailand	Chemistry	Lecturing chemical safety topics using manga narratives.
Gerde, V.W. & Foster, R.S.	2008	X-Men ethics: Using comic books to teach business ethics	Business	Using comic books to communicate, discuss, and critique business and social ethics.
Jenyk, S. & Wakefield, D	2018	Guns, Butter, and Dr. Seuss: Using Political Cartoons to Teach the PPC	Business	Using political cartoons to introduce and illustrate the production possibilities curve.
Mills, A.J., Robson, K. & Pitt, L.F.,	2013	Using cartoons to teach corporate social responsibility: A class exercise.	Business	In-class group exercise to analyse and discuss public sentiment related to corporate responsibility in political cartoons.
Green, M.J.	2015	Comics and Medicine: Peering Into the Process of Professional Identity Formation	Medical education	Creating a comic to improve students' competencies, attitudes and stimulate professional identity formation.
Kim, J., Chung, M.S., Jang, H.G. & Chung, B.S.	2017	The use of educational comics in learning anatomy among multiple student groups	Anatomy	To enhance students' interest and comprehension of basic anatomy through comics.
Vietz, K. & Grinnell, S.	2004	Does pathophysiology have to be boring?	Nursing education	Student designed posters and humorous storylines to teach Pathophysiology
Tanaka, Y., Iida, H. & Takemura, Y.	2018	A Manga-Driven System Requirements Development PBL Exercise	Engineering, software development	Problem based learning exercise drawing manga to improve communication in Requirements Development.
Giese, R.W.	2020	Connecting Current Literature, Cartoons, and Creativity: Incorporating Student-Created Cartoons in a Biochemistry Course to Enhance Learning	Pharmacy, Biochemistry	Creating and sharing summary cartoons to strengthen students' learning of pharmaceutical topics
Fradkin, C.	2018	The use of cartoon illustration for the assessment of social science concepts	Social science	Cartoons as an alternative assessment to evaluate students' conceptual knowledge of social theories.
Toledo, A., Yangco, T., & Espinosa, A.	2013	Media cartoons: effects on concept understanding in environmental education	Geography	Use of media and political cartoons to developed conceptual understanding of environmental issue
Rodrigues, A.I.	2018	The use of visual methods in tourism classes: The case of photo essay, cartoons and videography	Hospitality	In-class activity whereby students analyse contributions from the International Tourism Cartoon Competition to stimulate reflection on the societal impact and contextualise tourism worldwide.
Dougherty, B.K.	2002	Comic Relief: Using Political Cartoons in the Classroom	Social sciences	Description and guidance on how to use political cartoons in the social classroom to stimulate debate and critical thinking.

TABLE 2 Selection of articles using manga, cartoon, and graphic novels in HE

Many cartoonists and academics have started to share creative reflections on their work in cartoons or animations

Diversifying reading lists

Manga and graphic novels, like non-fiction and documentaries, explore professionally relevant topics from a personal perspective, bringing to life the psychological, social and financial implications that might be difficult to mediate in the classroom. Various titles carry relevance for disciplines like nursing, social work and psychology; for instance, Ernest, in *Wrinkles* by Paco Roca, looks at Alzheimer's and the transition into a nursing home, while the protagonist in *Epileptic* by David B describes his brother's battle with epilepsy. *In A Silent Voice* by Yoshitoki Oima, the trajectory of a group of maturing youngsters is played out, whereby the drama unfolds the psychological and social implications of living with disabilities and bullying. Other series, such as the science fiction manga *Planets* by Makoto Yukimura, explore the implications of corporate responsibilities, engineering, and technological dependences and political inequalities as a background against which the protagonists struggle with their own insecurities and ambitions. As such, each good reading list might benefit from a curated extracurricular section of literature, films and graphic novels.

Many titles discussed above and presented in Table 1 will not cover scientific topics in considerable depth, still information- or textbook-manga has been specifically written for mature learners to stimulate interest and advance their science literacies. The publication of book-length educational manga in Japan and elsewhere dates back to the 1980s (c.f. MacWilliams, 2008). Through, for instance, visual metaphors and relatable character-driven narratives, information manga have the potential to make scientific information and topics more engaging and accessible to a wider audience. A classic graphic novel example is *The Cartoon Guide to Statistics* by Larry Gonick and Woollcott Smith. *The Manga Guides* is a series of educational manga, written by different authors, which explores a particular subject by combining normal textbook sections with manga storylines to bring the topics to life, and explore real world problems. Although the gender stereotypical roles need to be considered with care, the titles include, for instance: biochemistry, statistics, databases, cryptography and physiology. Another series worth pointing students' attention towards is *Introducing ... A Graphic Guide*. This extensive series of information manga has a wide range of titles on topics and thinkers including mathematics, natural sciences, philosophy and media theory. The series publishing history has roots in a cooperative and socialist mission to make subjects and the thinking of influential individuals available in an accessible way for an adult readership (c.f. O'English *et al*., 2006). Although its titles will not suffice on their own, they are a great source to expand students' horizons, and signpost how professional knowledge can be mediated to a wider audience.

Cartoon hook

An important aspect of any lecture or session is the induction, according to Madeline Hunter,who developed the seven-stage lesson plan. The induction is the first stage of engaging students within the classroom and aims to raise anticipation, grab their attention, and put them in the right frame of mind. For this reason, the induction is often called the 'hook' (Schroth and Helfer, 2015). Starting a session with humour will help to draw students in, reduce intellectual resistance, and help alleviate any uncomfortable feelings. Hooking students into the session can be done in many ways, and commonly used strategies include introducing real world examples, case studies, metaphors, and debate, to problematise or raise the importance of the topic. Carefully selected manga, graphic novels and cartoons may be the perfect catalyst for this type of activity.

Many cartoonists and academics have started to share creative reflections on their work in cartoons or animations. They have stimulated an exchange of new ways of communicating theoretical and practical knowledge, while others engage directly with scientific and professional topics, stretching scientific reasoning, life experiences and other existential trivia in bar- and Venn diagrams that can help to hook students in on occasion. For instance, Rosemary Mosco's *Birding is my favorite video game* is a collection of comics illustrating zoological and biological sciences in a gentle and adorable way while carrying an environmental message. Taking scientific facts, interdisciplinarity and timelines not too seriously, the *NewScientist* cartoons by Tom Gauld collected in the *Department of Mind-Blowing Theories* or @twisteddoodles offer ample examples to reflect on the realities and misconceptions behind academia, discovery, and research methods. The webcomic *XKCD* by Randall Munroe, offers plenty of geek humour to introduce a discussion on mathematics, programming and natural science topics.

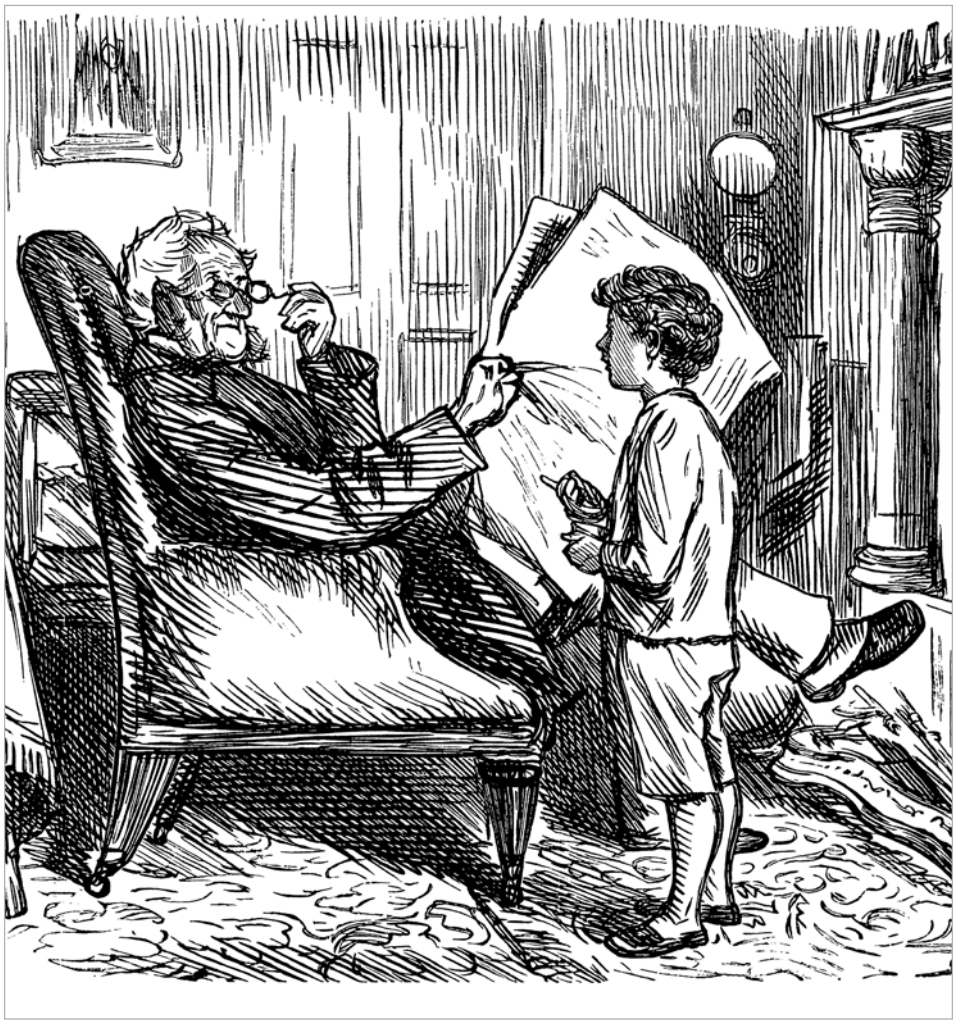

FIGURE 1 Concept- or summary-cartoon worksheet

Besides highlighting the latest political intrigues and drama, editorial cartoons depict and interpret the political thinking around many topics like global warming, air pollution, housing, transport, technology, infrastructure, social welfare and health

Analysing editorial cartoons

Editorial or newspaper cartoons are another excellent source for a cartoon hook that brings the currency of many topics to the attention of students. Besides highlighting the latest political intrigues and drama, editorial cartoons depict and interpret the political thinking around many topics like global warming, air pollution, housing, transport, technology, infrastructure, social welfare and health. Taking a few minutes to analyse and discuss political cartoons, either collectively or as a think-pair-share activity, not only introduces the topic, but the creative illustration also helps to develop critical and analytical skills, deepen students' understanding of the public perception, and the civic impact of their discipline or profession (see Table 2). A variation to develop students' own positionality and reflection could include an individual or small group activity in which students complete a blank version of the newspaper cartoon and come up with their own satirical headline or comical dialogue. Facilitated with a short presentation and ranking of that which is the most humorous, satirical, entertaining, or relevant to the session topic will additionally stimulate engagement and contribute to students' sense of belonging.

Concept cartoons dialogues

Developed for primary and secondary education, concept cartoons usually consist of a few characters who in an everyday situation have a dialogue to discuss and raise questions about a natural phenomenon, concept or idea. These are different from newspaper cartoons in that they are not made to entertain but, rather, stimulate an inquiry into students' understanding and challenge misconceptions. Concept cartoons are used for a variety of educational purposes; besides keeping readers motivated to read and expand their vocabulary, they support the development of thinking and the recognition of misconceptions and problem solving, and make scientific ideas more accessible and tangible (Naylor & Keogh, 2013). These concept cartoons are teacher-centred and usually designed and drawn professionally. Within HE, integrating activities that stimulate conceptual clarification is a key aspect of active learning. Many subjects require the understanding and clarification of counterintuitive knowledge. Rephrasing or summarising these concepts in students' own words is an essential learning activity that cements their understanding. In a student made summary or concept cartoon students are asked to develop their own cartoon dialogue, in which they explain, or develop a misunderstanding of a key concept, formula, piece of coding or schematic representation. To lower the barrier for engagement a worksheet with different single panels containing various characters and blank speech bubbles can be provided, which students can sequence themselves to create a striking dialogue (see Figure 1). Developing a concept or summary cartoon either individually or as a cooperative-learning activity is less dry than the commonly used one-minute paper or muddiest point activity, and variations on this activity have been used in different subjects to strengthen students' understanding, or as an alternative assessment strategy (see Table 2).

Science cartoons and humoristic infographics

Visual narratives and metaphors are essential to science education and communication. An example of communicating scientific findings in a graphic form is the SRHE funded research by Vigurs *et al*., (2016) *Higher Fees, Higher Debts*, which is not only an academic and artistic contribution but aims to stimulate public engagement with a wider audience, in this case HE students. Another is Farinella's (2018b) graphic paper *Of Microscopes and Metaphors: Visual Analogy as a Scientific Tool*, exploring the importance of analogies, metaphors, and conceptual frameworks as a key component of scientific thinking.

Considering the professional destination of many of our students, who will be working in professional roles that require public engagement, communicating and mediating often complex information, principles or guidelines. Being familiar and able to communicate through a variety of formats will be essential to reach out to diverse non-specialist groups and communities (c.f. Farinella, 2018a). Student led presentations are an established active learning activity, as they stimulate engagement, motivation, and self-efficacy, and the development of essential employability skills such as planning, peer-feedback and collaboration. Alternatives to a standard presentation are student-led humoristic- infographics and posters (see Table 2). In the public sector and on social media, information cartoons, infographics and animations are ubiquitous, and a good start would be the WHO infographics to get inspiration. The poster format requires students to summarise concisely and highlight what is essential, both of which are crucial academic skills, and the humoristic narrative allows students to express their topic creatively. Moreover, humoristic infographics stimulate students to reflect on their professional role to mediate complex information and experience the benefits and boundaries of different formats in terms of public engagement. As with concept cartoons, infographics are developed products and upon completion can be presented, with students' permission, within institutional corridors, at faculty away days, at research conferences, and during outreach activities and professional networking events, enabling a wider reach of the outcomes and creating a sense of community.

Conclusion

This brief overview has shown the relevance of manga, graphic novels and cartoons to the HE context, and Table 2 contains many more examples. The basic premise of manga, graphic novels and cartoons is to entertain, but humour is a matter of taste. Taste, as the sociologist Pierre Bourdieu argues, is a matter of preference and distinction. As such care needs to be taken with the assumption that cartoons will be experienced as playful and their intellectual, social, historic, or political context will be immediately understood when brought into the learning environment. However, as shown, the relevance of manga, graphic novels, and cartoons for HE has developed well beyond entertainment. The examples in Table 1 showcase how scientific knowledge can be mediated to a range of stakeholders including patients, clients, and customers, which is an important skill for any HE professional. There is considerable scope for further work, and the activities presented in this article are suggestions how manga, graphic novels and cartoons could be used for teaching and supporting learning in HE. As such we should look forward to further collaborations, scholarship and research exploring the pedagogical opportunities of information manga, cartoon hooks, concept- and summary-cartoons and humoristic infographics to make teaching and learning in HE more engaging, varied, and inclusive.

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About the author

Hendrik van der Sluis, Senior Lecturer in Higher Education, Research and Practice, University of West London, UK

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Active learning, student engagement, diversified curriculum, professionalism

Georgia Brakespear | University of West London, UK
Moira Cachia | University of West London, UK

YOUNG ADULTS DEALING WITH LONELINESS AT UNIVERSITY

Loneliness is a phenomenon that occurs across the lifespan, having consequences for both physical and mental health. This article reports a study focussing on university students' perceived loneliness. The findings from the thematic analysis of online contributions to relevant forums highlight that loneliness affected the students' experience by influencing their psychological wellbeing, social identity and academic performance.

Both loneliness and social isolation have contributed to poor mental health, difficulties when coping with stress, and academic burnout, which can negatively impact a student's overall experience within Higher Education

Attending university is a significant period of life for many young adults, presenting new opportunities for change and independence, which may represent a positive change. However, this transition also includes a variety of new structural and social challenges such as living in an unfamiliar location and not knowing others in the area, which may lead to the risk of loneliness (Diehl et al. 2018). Previous research highlights how the transition to university may be challenging for some students and can be characterised by feelings of loneliness (Kerrigan, Thomas & Orne, 2020). Both loneliness and social isolation have contributed to poor mental health, difficulties when coping with stress, and academic burnout, which can negatively impact a student's overall experience within Higher Education (Stoliker & Lafreniere, 2015). Similarly, due to the recent Coronavirus pandemic and university teaching moving online, social isolation and loneliness has become more prevalent. This has had a negative impact on students' mental health, whilst increasing their stress levels (Savage *et al*. 2020).

During the transition to university, students leave established relationships behind and are expected to establish new ones (Dill & Anderson, 1999) – something that has been known to elicit considerable personal stress and tough educational challenges (Berzonsky & Kuk, 2000). Succeeding this, parental attachments have shown a correlation with loneliness during the transition to university. Securely attached individuals develop intimate social relationships and are therefore less lonely. Equally, those with avoidant or ambivalent attachments displayed high amounts of loneliness (Wiseman *et al.* 2006). Another developmental aspect of loneliness in young adults is the prominence of romantic relationships. The association between personal satisfaction with intimate relationships and loneliness revealed that students who were content with their partner, reported lower levels of loneliness (Flora & Segrin, 2000).

Defining loneliness

Definitions surrounding loneliness have varied due to different theoretical orientations. Weiss (1973) conveys loneliness as a conventional response from individuals when they are deprived of definite relationships and offers two categories: emotional loneliness and social isolation. Emotional loneliness derives from the absence of intimate relationships and can lead to feeling anxious or frequently seeking others to provide companionship. Whereas, social isolation occurs when individuals cannot identify their social network, whereby they are part of a friendship group and share common interests with others.

Perlman and Peplau (1981) define loneliness as a social deficit that expresses itself in four distinct factors: motivation, affective factors, behavioural factors and social problems. Firstly, an individual's motivation may fluctuate when they feel lonely, whereby isolated individuals feel motivated to seek new friendships but lack motivation towards tasks. Secondly, affective factors imply that loneliness is an unpleasant emotional encounter linked to unhappiness, depression and/or anxiety. The next classification incorporates behavioural factors such as exhibiting physical indications of anxiety, including disturbed eating. Lastly, social problems are considered the final outcome of loneliness, underlining the association between illness, alcoholism and suicide (Perlman & Peplau, 1981).

More recently, Hawkley and Cacioppo (2010) introduced a 'Model of Loneliness', implying isolated individuals view the world as an intimidating environment, anticipating more negative social exchanges. They reported that perceived social isolation is associated with feeling insecure, causing unconscious hyper-vigilance for danger within society. When lonely individuals have negative expectations about shared interactions, they consciously distance themselves from others, creating a self-fulfilling prophecy.

Understanding loneliness

The relationship between social interaction and the influence on both physical and mental health has been widely researched. The physical implications of loneliness range from headaches, nausea, sleep disturbances and intensified cortisol levels to poor immune system and mortality. Moreover, there are numerous mental health conditions associated with loneliness including depression, with individuals feeling more pessimistic or helpless (Hawkley & Cacioppo, 2010).

Loneliness is a serious risk factor for engaging in poor health behaviours such as smoking, increased alcohol consumption and decreased engagement in exercise (Cacioppo *et al.* 2002). Nonetheless, social support presents positive repercussions for psychological wellbeing and health behaviours such as irregular diet, sleeping patterns, exercise, smoking, and alcohol intake (Cohen et al. 2004). This occurs as practical information is conveyed to the lonely individual, helping them to maintain their health behaviours.

The relationship between social skills, self-esteem and shyness have been found to increase the possibility of loneliness. Deficits in social skills including lack of assertiveness, self-consciousness and difficulty in initiating conversations have contributed to feelings of loneliness. These discrepancies create barriers when building friendships, attending parties, initiating social activities, and participating in a group setting (Jones *et al.* 1982). Perlman and Peplau (1981) argue that shy individuals avoid interaction or feel anxious when communicating with others, hence displaying inadequate social skills during a social setting. This results in fewer friendships and difficulty maintaining current relationships. Shyness can produce minor outcomes including feeling awkward or embarrassed, whereas major consequences include low self-esteem and the onset of depression or anxiety (Dill & Anderson, 1999).

The approaches utilised to manage loneliness are also worth noting. Befriending schemes, group therapy sessions and psychological therapies have been successful in adjusting self-defeating beliefs (Griffin, 2010). Recently, there has been growing research surrounding the internet being used as a support system. Kim et al. (2009) reported the intention for individual's internet use was to relieve psychological problems including loneliness and depression by offering interaction and a sense of community.

Gaining the student experience

This qualitative study analysed online, public forum posts, composed by university students and graduates, which were retrieved from: TheStudentRoom.co.uk, SocialAnxietySupport.com and MentalHealthForum.net. The students engaging in the discussions, identified themselves as feeling lonely during their present or former experiences at Higher Education. Similarly, these forums encouraged students to offer advice and support to others in a comparable situation. No demographic data including age or gender was obtained from the forums. However, the participating posts included reference to moving to university after their school years, qualifying them as young adults, which was the focus of this study. A total of 100 posts were collected for the data analysis within seven public forum threads, varying between four and 797 words in length. Thematic Analysis (Braun & Clarke, 2006) was then used to classify three significant themes within the data: psychological wellbeing, social identity and academic performance.

Students described that since attending university their mental health had deteriorated, as they felt alone or unsupported throughout this period. The forums depict university as overwhelming, with several students finding it difficult to cope with the responsibilities

Psychological wellbeing

The effect on students' mental health was the most widespread outcome of loneliness declared in the forums. The two predominant mental health conditions were depression and anxiety. Students described that since attending university their mental health had deteriorated, as they felt alone or unsupported throughout this period. The forums depict university as overwhelming, with several students finding it difficult to cope with the responsibilities, as expressed by a contributor: *"I had lost my mind, crying all the time, scared I was making others feel miserable… I have never been so down in my life like I had the first few months since September."*

However, various students appraised their university services to manage loneliness and support mental health. This included speaking to course leaders, counsellors, or academic support workers to alleviate stress and provide guidance. Alternative indications implicated joining available societies, offering a cohort of peers with similar interests. Similarly, using online forums helped students manage their loneliness, providing endless support for others to evaluate. Social media, such as Facebook groups, provided opportunities to connect with peers and information regarding university events, helping students integrate and communicate with unfamiliar peers. Those who utilised these methods confirmed their psychological wellbeing had improved and feelings of loneliness had reduced.

The forum comments also identified loneliness as having a negative effect on students' self-perception, largely constructed from the response of others. Various posts highlighted certain individuals believing they did not fit in at university, explaining they considered themselves different from their peers, during lectures or in their student accommodation. Whilst students felt this way, it coerced them to behave in a certain manner that did not represent their true self. This behaviour was justified by addressing how being themselves could result in peers disliking them, suggesting a lower self-concept: *"I feel like if I be myself they'll think I'm an idiot but I don't want to act like something I'm not either."* These features highlight how loneliness can contribute to a low self-concept for students who presume they are different to their peers.

The forums also identified the relationship between lonely students and binge eating or drinking, smoking and sexual relationships with strangers. Firstly, alcohol, food and tobacco were recognised as coping methods to ease stress or help forget about circumstances at university. Secondly, consuming excessive alcohol and smoking was an acknowledged attempt to fit in with peers who had different interests, as admitted by one student: *"I didn't feel THAT drunk so I kept going … I knew I was drunk really and I should stop but I couldn't. I drunk more than I normally drink in a fortnight… so I binged on a takeaway on the way home."* Notably, students who used smoking, drinking or sexual relationships to alleviate feelings of loneliness also described subsequent discontent.

Students experienced varying levels of loneliness depending on their relationships with significant others, including family, friends and partners. Students without a partner or close family relationships reported feeling unsupported and found the transition to university challenging

Social identity

Students wrote about loneliness altering their sense of self, based on their involvement with different social groups. In some cases, loneliness became a barrier for students trying to develop friendships with peers. These included physical barriers such as not leaving their house, attending social events or lectures. Alternatively, mental barriers comprised of students believing they had different interests to others and that they did not know how to form friendships or initiate conversations with new people: *"I had friends, but nobody I felt really close with… I felt left behind, like I didn't know how to form that connection with someone… at all!"* Both physical and mental barriers resulted in further loneliness as individuals isolated themselves more and avoided opportunities to build new friendships.

The forum posts also indicated that students who felt lonely had distorted beliefs about other social groups. Those who experienced loneliness, also presumed they were the only ones who felt this way, viewing peers as being part of large social groups, making socialising more intimidating, as illustrated here: *"I feel like making friends this far into second semester will be really hard because everyone already has their friendship groups."*

Students experienced varying levels of loneliness depending on their relationships with significant others, including family, friends and partners. Students without a partner or close family relationships reported feeling unsupported and found the transition to university challenging. Whereas those who openly confided in their families or had a significant other, felt that this reduced lonely periods. Students within content relationships felt unconcerned about establishing friendships, inferring their partner took priority over possible loneliness. Similarly, when partners or family came to visit often, it helped reduce loneliness: *"I'm on my own every night, if it weren't for my boyfriend coming down every so often I'd of lost my mind because I don't have any friends here or at home anymore…"*

Academic performance

Numerous individuals discussed how loneliness had an effect on their academic performance during university. Students stated that, when feeling alone, they procrastinated more whilst preparing for assignments, avoided studying and completing coursework. Those who delayed assignments chose to avoid lectures and study at home. Consequently, students lacked interaction with peers and the opportunity to interact with others. One reason for procrastination suggested individuals could not balance the demanding workload whilst participating in activities they found enjoyable. Therefore, students were unmotivated to study or considered their efforts pointless: *"I'm definitely lonely and it makes me question why I go to school since I seem to feel so lonely and put off work so much."*

Students also wrote about feeling overwhelmed with the responsibilities of university, causing them to feel permanently exhausted for two reasons. Firstly, students who felt anxious about their social, academic and financial circumstances, explained they could not sleep and then felt exhausted the following day. Secondly, students reported feeling drained by the constant workload and their newly found independence. Students who could not confide in their family, found it exhausting to balance all their commitments and to find time to socialise: *"Even when I want to socialise or just relax… I am way too tired to do so. It's really wearing me out."*

Loneliness was found to have both a positive and negative effect on students' results. On the one hand, the posts described students' coursework being incomplete due to postponing studying and feeling depleted. Then, if students received a bad mark, their efforts decreased for future assignments. Lonely students also acknowledged not having networks to help with their academic concerns or workload. Similarly, numerous students purposely avoided attending lectures due to feeling uncomfortable when sitting alone. On the other hand, the forums illustrated loneliness as having a positive effect on grades at university, as it distracted students from their reality. Several posts focused on how individuals used their time alone to complete their coursework, allowing them to overlook their social situation and focus on their workload. Others agreed that loneliness aided their motivation whilst completing their studies, since it kept them busy during lonely periods: *"The school work is fine, there's a lot of it, but it keeps me distracted from the fact that I have very few friends…"*

Loneliness affected the students' experience by influencing their psychological wellbeing, social identity and academic performance. The results illustrate that when loneliness had a negative impact on students' psychological wellbeing, it led to their social identity and academic performance declining for several reasons

Understanding the student experience

The aim of this study was to consider the various features of students' experience at university that were predisposed due to their perception of loneliness. This study discovered loneliness affected the students' experience by influencing their psychological wellbeing, social identity and academic performance. The results illustrate that when loneliness had a negative impact on students' psychological wellbeing, it led to their social identity and academic performance declining for several reasons. Primarily, suffering from mental health conditions includes symptoms such as tiredness and motivational deficiency (Perlman & Peplau, 1981). This added to students' previous exhaustion from their workload and consequently they lost further motivation when completing assignments. Comparably, receiving bad grades meant students considered themselves as failures, contributing to their poor psychological wellbeing, self-concept and participation in risk taking behaviours (Cacioppo *et al*. 2002). Individuals possessing a lower self-concept formed more barriers when developing friendships and had distorted belief about others because they consider themselves different (Jones *et al*., 1982). Lastly, academic performance can affect the relationship between students and their significant others, as parents felt disappointed when students did not obtain good grades. Therefore, loneliness was highlighted as having a negative effect on several students' psychological wellbeing, academic performance and social identity.

However, loneliness also presented ways to improve psychological wellbeing, having positive effects on social identity and academic performance. Students who focused their attention on assignments when they felt alone, confirmed that their grades improved. Receiving higher grades enhanced individuals' motivation and self-esteem, thus resulting in a positive self-concept and optimistic relationship with significant others. Similarly, students who took control of their loneliness by seeking help from the university services or using the internet to communicate with others, found their loneliness decreased whilst their psychological wellbeing and social identity increased (Kim *et al*. 2009). This demonstrates that loneliness can have a positive effect on certain features of the student experience at university.

Practical implications of this study

These findings have implications for practice, highlighting the importance of online befriending schemes at universities. Employing online befriending schemes within universities, might provide students who feel too anxious to join societies an alternative way to meet new peers. Once individuals feel more confident, they can progress from socialising online to meeting their new friends in person. Thomas (2012) recognises an effective example of befriending schemes within the University of Sheffield, aiming to support the transition to university, reduce withdrawal and enhance students' sense of belonging and community. Secondly, psychological interventions such as group therapy sessions may be valuable for some students within their university as talking therapies encourage the development of self-acceptance and relating to others (Griffin, 2010). This encourages students to meet new people who may be in a similar situation to them, also making the individual aware of others experiencing related challenges. Additionally, this increases the chances of managing loneliness, as social support has been found to play a major role on levels of loneliness. This paper recognises both the positive and negative effects loneliness can have during young adults' experience at university and aims to outline practical implications that can be implemented to support students further.

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About the authors

Georgia Brakespear, Research student in Psychology; Moira Cachia, Senior Lecturer in Psychology, University of West London

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Robyn Butcher | University of West London, UK
Rosemary Stock | University of West London, UK
Siobhan Lynam | University of West London, UK
Moira Cachia | University of West London, UK

ACADEMIC SUCCESS AND INDIVIDUAL DIFFERENCES

Individual differences in students such as motivation, self-regulation and feedback orientation all have an impact on completing academic tasks. Additionally, motivation to study has been shown to impact course engagement. The aim of this research is to explore whether these individual differences can directly predict academic successes at university.

The responsibility of educators is to engage students with the subject material and provide the best opportunities for them to become academically successful. Academic success (AS) is often defined in terms of favourable learning outcomes with grades being the most common measure of AS in literature. However, AS has been evidenced as far more nuanced a concept. A literature review conducted by York, Gibson and Rankin (2015) found AS to be comprised of: achievements, meeting learning outcomes, satisfaction, acquiring skills and competencies, and career success. Furthermore, while the role of academic staff is to provide guidance, it is important to remember that students themselves are not passive in their own learning. Considering individual differences (IDs) that contribute to academic successes or failures may allow organisations of higher education to adapt their teaching methods to improve outcomes and reduce course attrition.

The aim of this study was to investigate the relationship between motivation, self-regulation, feedback orientation and academic success in order to identify those IDs that contribute to greater AS, as well as any correlates between the variables. In this way, educators can adapt their teaching to encourage beneficial academic IDs, ensuring that students are getting the most from their education and meeting their academic potential.

The aim of this study was to investigate the relationship between motivation, self-regulation, feedback orientation and academic success in order to identify the individual differences that contribute to academic success

Individual differences

One key individual difference is motivation. Vallerand, *et al.* (1992) found that intrinsic motivation, where an individual is motivated by an internal drive, is more closely linked to better academic outcomes than extrinsic motivation (an external drive) or a lack of drive entirely, known as amotivation. Students who are intrinsically motivated pursue their studies for enjoyment and to broaden their minds; these students are more likely to work diligently and maintain stability in their efforts over time than if they are extrinsically motivated (Vansteenkiste, Lens & Deci, 2006). Vansteenkiste, Lens and Deci also suggest that strategies which increase extrinsic motivation (such as payment or other rewards) may be associated with a decrease in intrinsic motivation. Encouraging the intrinsic motivation of students, over extrinsic motivation, could therefore be expected to positively impact their success. Ergo, the argument is made for the importance of task framing, how a task is presented can influence what motivations are developed to complete it. Framing a task to appeal to intrinsic motivations might be the best way for educators to foster sustained engagement and effort from their students.

Being motivated to complete tasks is important but also requires behaviours that facilitate their completion. It is in this way that self-efficacy and self-belief contribute to AS, and how a learner regulates their time and efforts can channel motivation into positive outcomes. Academic self-regulation (SR) pertains to why a student completes academic tasks (Kröner, *et al.*, 2017). Self-regulation can be driven by the desire for or avoidance of consequence, external factors such as a sense of duty or placing personal importance on completing tasks, or simply for enjoyment. Those with higher overall self-regulatory behaviours are shown to have higher self-efficacy and confidence in their abilities (Sebesta & Bray Speth, 2017). It could be hypothesised that those who are motivated by learning new things and regulated by the satisfaction of gaining knowledge or finishing assignments have the greatest potential for success. Sebesta and Bray Speth (2017) also show that self-regulation has a positive relationship with both motivation and receptivity to academic feedback.

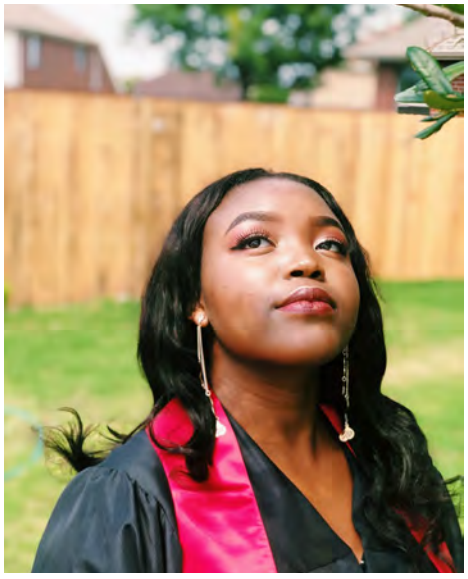
Feedback is an established and integral part of teaching in higher education and can be given to students formally through the marking of assessments and informally, for example during teaching sessions. However, research questions the usefulness of feedback and whether it relies on IDs, such as motivation, to be beneficial (Winstone *et al*., 2017). If feedback is indeed reliant on such variable IDs as motivation and self-regulation then this could mean the difference between feedback being a useful tool for students or an unutilised resource (Pitt & Norton, 2016). Due to feedback being so ingrained in higher education, exploring this relationship will help us determine how to optimise its use. The concept of Feedback Orientation (FO) as defined by Linderbaum and Levy (2010), denotes how feedback is perceived and utilised by the person receiving it. Their research goes on to explain that acting on feedback can have several drives. It could be that a student wishes to use it to improve performance, they feel an obligation to follow up on feedback or that they use it as a measure of how to perceive themselves or how they are perceived by others. In addition, those with higher overall FO – regardless of what drives it – are more receptive to feedback, more likely to engage with their educators and therefore more likely to continue to improve on their receptivity and use of feedback over time, a phenomenon referred to as their 'coachability'.

Motivation, self-regulation and feedback orientation run parallel with the concept of a 'growth mindset' (Ng, 2018), the belief that cognition – and therefore motivation – is malleable. Those who hold this mindset are more susceptible to positively developing their cognitions, skills and in turn, more positive IDs that have been outlined above. It is suggested that a somewhat symbiotic relationship occurs between these concepts, whereby they foster the development of one another. Therefore, those with higher positive IDs are more likely to be able to improve their ability to learn over time, and this can be encouraged by those working in higher education, furthering this mindset and improving students' overall success.

Methodology

Convenience sampling was used to recruit participants who completed online questionnaires. The quantitative data were analysed using SPSS software. Multiple regression was used to assess the contribution of five predictors (extrinsic motivation, intrinsic motivation, amotivation, self-regulation and feedback orientation) to the outcome of academic grade. Students who had completed one full year of study were recruited from the University of West London. Recruitment took place online, and by directly approaching students in communal areas of the university and before lectures. There was a total of 142 participants, of which 68 were male (47.9 %) and 74 were female (52.1 %). Participants were aged from 18 to 54 years, with a mean age of 24.35. Two participants did not disclose their age. Demographic data was collected on whether they were a first generation student, their level of study, academic school or college, age, ethnicity and gender. Self-reported average grade for the last academic year was also collected.

The Academic Motivation Scale produced by Vallerand, *et al*. (1992) was used as the measure of motivation for this study. This scale identified three subscales of motivation: intrinsic, extrinsic and amotivation. Intrinsic motivation included the subscales of 'to know', 'towards accomplishment' and 'to experience stimulation'. Extrinsic motivation contained 'identified', 'introjected' and 'external regulation'. Amotivation contained no subscales. This scale had twenty-eight items (four in each subscale) and used a 7-point Likert scale with answers ranging from 'corresponds exactly' to 'does not correspond at all'.



The Academic Self-Regulation Questionnaire (SRQ-A) from Kröner, *et al*. (2017) was used to measure self-regulation and the autonomous reasoning for study-related behaviours and task completion. Due to being devised for school children, some language in this scale was adapted to fit a Higher Education setting. There were 32 items evenly distributed over four subscales. Participants answered using a 5-point Likert scale from 'very true' to 'not true at all'. The subscales were external 'regulation' (being motivated by external factors), 'introjected regulation' (motivated by opinion – of others and of the self), 'identified regulation' (personal importance placed on one's academic achievement and progress), and 'intrinsic regulation' (for the enjoyment felt from learning and progressing). High scores in this subscale indicate students can more easily motivate themselves and have better study-related behaviours.

The Feedback Orientation Scale (FOS), devised by Linderbaum and Levy (2010), measures receptivity and reaction to academic feedback. There were twenty items evenly distributed over four subscales. The first subscale 'utility' referred to an individual's inclination to act on feedback to reach goals, the second 'accountability' was where an obligation is felt to act on it. The next subscale 'social awareness' was the individual using feedback to assess how they are perceived by others and perceive themselves. Lastly 'feedback self-efficacy' involved confidence in interpreting and acting upon feedback appropriately.

Approval for this study was obtained from the University of West London's ethics panel. An online questionnaire combining the aforementioned measures with demographic questions was constructed using Qualtrics software. An information sheet and consent form preceded the questionnaires, and a debrief sheet followed. Information provided to participants included information on the study, their rights to anonymity and to withdraw at any time, and the contact information of the researchers. The consent form included qualifiers: these were that the participant was eighteen or older, had completed a full year at the University of West London, and that they understood and wished to take part in the study. Paper copies of the information and debrief sheets were available upon request. Participation was voluntary and without extrinsic reward apart from those studying psychology who could gain SONA points. SONA is a credit system that allows those who have accrued enough points to gift SONA points of their own to incentivise participation for their third-year dissertation projects. Participants were thanked once they had completed the survey and SPSS software was used in the analysis of the completed dataset.

Measure	1	2	3	4	5
1. Grade	_				
2. Amotivation	-.30**	_			
3. Intrinsic motivation	-.03	.05	_		
4. Extrinsic motivation	-.06	-.02	.20*	_	
5. Self-Regulation	.21*	-.15	.04	.18*	_
6. Feedback Orientation	.04	-.05	.04	.24**	.39***

* $p < .05$, ** $p < .01$, *** $p < .001$

TABLE 1 Correlations between student grades, self-regulation, feedback orientation and all motivation subscales

Measure	*Beta*	*t*
Amotivation	-.27	-2.65**
Intrinsic motivation	-.04	-.34
Extrinsic motivation	-.05	.42

Regression model: $F(5,85) = 2.33$, $p < .05$, $R^2_{adj} = .07$ ** $p < .01$

TABLE 2 Summary of multiple linear regression

Results

Data on feedback orientation (FO), self-regulation (SR), motivation and self-reported academic grade were tested for associations.

Table 1 shows correlational data between students' grades and overall feedback orientation (FO), self-regulation (SR), and motivation scale scores. The following significant correlations were found. FO was positively correlated with extrinsic motivation, $r(89) = .24$, $p < .01$ and SR, $r(89) = .39$, $p < .001$. Self-regulation also showed positive correlations with academic grade $r(89) = .21$, $p < .05$ and extrinsic motivation $r(89) = .18$, $p < .05$. Amotivation showed a positive correlation between Extrinsic motivation $r(89) = .20$, $p < .05$ and a negative correlation with Grade $r(89) = -.30$, $p < .01$.

Multiple linear regression showed that all predictors combined accounted for 12% of variance in grade in the sample. Using R squared adjusted, to account for the small sample size, just 7% can be accounted for in the target population. This was a significant model, $F(5,85) = 2.33$, $p < .05$. When examining individual predictors, only amotivation remains significant, as a negative predictor of grade.

In order to examine the relationship between extrinsic motivation and feedback orientation in more detail, Pearson's correlations were conducted between extrinsic motivation and each of the subscales of FO. The only significant correlation found was with the social awareness subscale, $r(140) = .25$, $p < .001$

Discussion

This was an exploratory study which aimed to examine the relationships between the concepts of motivation, self-regulation and feedback orientation in relation to academic grade. It was found that these measures did significantly predict academic grade, with amotivation being the strongest predictor. As anticipated, and in line with previous research (Vallerand *et al.*, 1992), amotivation negatively predicted grades, indicating that those lacking motivation are less likely to achieve high grades. While self-regulation positively correlated with academic grades (high grades being associated with high self-regulation), it was not a significant predictor when other variables were accounted for, indicating that self-regulation is not the most influential of the variables in predicting success. It is also notable that the strongest relationship found between any of the measures was the positive correlation between self-regulation and feedback orientation, supporting the theory that students with high feedback orientation – who feel most willing and able to use their feedback – are those with high self-regulation.

The Importance of Motivation

A notable finding of this study is the positive relationship between extrinsic motivation and feedback orientation; inviting the possibility that feedback from others (in this case academic staff) can be viewed as an external reward. Previous research (Vansteenkiste, *et al.*, 2006) highlights the relationship between increases in extrinsic motivation and decreases in intrinsic motivation. However, this was not the case in the current sample, with the two facets of motivation actually showing a weak but significant positive relationship – 'weak but significant' here indicating that while the correlation is not strong, the finding is very likely to exist in the wider student population. Therefore, it should be considered that the two can both be present, and an increase of one may not necessarily lead to a decrease in the other. As such, intrinsic and extrinsic motivation may not be the 'zero sum game' that had previously been assumed. However, this assertion should be interpreted with caution as evidence from the literature suggests educators can still serve students best through intrinsic task framing.

The Utility of Feedback

When feedback orientation was examined in more detail it was found that extrinsic motivation only significantly correlated with the feedback orientation subscale of social awareness. Those who were externally motivated were more likely to view feedback as a tool for assessing how they and their work were viewed by others. As extrinsically motivated individuals are motivated by reward and the avoidance of punishment, it should not be surprising that feedback may be perceived as useful in this way. Extrinsically motivated individuals perceive feedback as useful in directing academic efforts towards reward and approval from others. As Vansteenkiste, Lens and

A notable finding of this study is the positive relationship between extrinsic motivation and feedback orientation; inviting the possibility that feedback from others (in this case academic staff) can be viewed as an external reward

Deci (2006) suggest, this type of feedback orientation and motivation is effective in completing academic work but is shorter lived than intrinsic motivation and other forms of feedback orientation. Therefore, having this type of approach to academic work may not produce long-term success and could go so far as to help us to understand course attrition figures.

Self-regulation: The 'Make or Break'

Even though extrinsically motivated people perceive feedback as useful in judging how others view them, this does not necessarily translate into behaviour. It was found that self-regulation and feedback orientation were highly and positively correlated. Those with higher self-efficacy and confidence in their academic abilities were more likely to respond to feedback. This supports the assertion that those with high self-regulation are better able to organise their time and efforts and utilise pertinent sources of support, such as feedback. Further analysis showed that being regulated by external factors had little significance in this relationship. Consequently, external regulation does not contribute to usage of academic feedback. This means that regardless of an individual's feedback orientation, self-regulation appears to be important individual difference insofar as the behaviour to act upon feedback and improve performance. This finding is interesting as framing such as 'please read this so that you can get better grades next time' might have little effect on encouraging students, whereas 'please read this so that you understand how to improve on X' may better encourage students to act. It is important therefore to be mindful of wording when delivering academic feedback to students if educators wish students to use feedback effectively.

Conclusion

It was found that higher intrinsic motivation does not necessarily coincide with lower feedback orientation. Therefore, framing tasks in a way that promotes extrinsic motivations may not need to be avoided completely. It may be beneficial to frame tasks both intrinsically and extrinsically to aid motivation. More research needs to be done to support or refute this finding. It may be beneficial to study this over time in order to test the longevity of extrinsic motivation's usefulness for academic work.

Academic success is a complex concept that cannot be wholly explained by grades. As found by York, Gibson and Rankin (2015), academic success consists of many varied and less quantifiable concepts and grades may not accurately reflect success in terms of deep learning. Therefore, a student may achieve high grades as the result of efforts geared towards passing assessments rather than in retaining information and skills which would better benefit them in future educational and career endeavours. Further studies need to be conducted to find measurements that include the less quantifiable features of academic success, such as satisfaction and career success. In this way, the concepts in this study can be explored with a more comprehensive view of academic success in mind. It is also worth mentioning that participants were recruited from one university and were a small sample size for this study design. Therefore, there is no way to know if this research can be applied to a general student population as it does not account for a wide range of differential factors such as culture and socio-economic status.

Having higher self-regulation coincides with higher motivation and feedback orientation. Being able to organise, plan and effectively carry out study are integral to a student's success regardless of feedback or motivational style. It is important for educators to recognise this, as an effective teacher who excels in motivating students may not see this reflected in outcomes. Developing skills that encourage self-regulation are vitally important for the application of a student's motivation and use of resources, such as feedback. It would seem that integrating ways to improve self-efficacy and self-confidence into the curriculum may be the most beneficial way to improve student outcomes. In this way, students will be better equipped to apply themselves to academic tasks, particularly when coupled with high motivation and feedback orientation, in order to achieve greater success.

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About the authors

Robyn Butcher, Research Assistant; Rosemary Stock, Senior Lecturer in Psychology; Siobhan Lynam, Senior Lecturer in Psychology; Moira Cachia, Senior Lecturer in Psychology, University of West London

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Livia Lantini | University of West London, UK

STUDENT PROFILE

Livia Lantini

Course
PhD in Civil Engineering

Year completed
2021

Title of thesis
Health monitoring of trees and investigation of tree root systems using ground penetrating radar (GPR)

Evidence suggests that trees and forests around the world are constantly being threatened by disease and environmental pressures. Over the last few years, new pathogens have spread rapidly in European forests, and quarantine measures have mostly been unable to contain these outbreaks. As a result, millions of trees were infected, and many of these have already died. It is therefore vital to identify infected trees on time in order to track, control and prevent the spread of disease.

In addressing these challenges, the available solutions often include cutting branches, incremental coring of trunks, or felling trees. However, these conventional techniques are destructive, difficult to implement and, mostly, unsuitable for a comprehensive information collection on trees' health.

In recent years, the application of non-invasive testing techniques has been accepted and valued in the arboriculture and forestry management sectors. Amongst these, ground penetrating radar (GPR) technology has increasingly been, given its flexibility, rapidity of data collection and cost-efficiency. Livia's research project aimed at addressing a major challenge within the context of the early identification of tree decay and disease control using GPR. Livia's PhD thesis addressed two main areas, namely, the characterisation of the internal structure of tree trunks and the assessment of tree root systems' architecture.

The approach proposed by Livia was transformative for the field and a departure from previous methods. Livia's research was recognised to have contributed to the development of novel methodologies for tree health monitoring using GPR. Her work has led to novel data collection, processing and interpretation techniques, with an important contribution to practical and theoretical work.

Livia's research has been published in numerous international peer-reviewed journals and presented at several international conferences, and received with interest by the scientific community. Livia was the recipient of a distinguished award for the 'Best Paper at the IEEE 2020 43rd International Conference on Telecommunications and Signal Processing'. She has also given invited presentations at prestigious national events and forums, such as a Business Breakfast event at the House of Lords, in February 2020. Livia is also a dedicated team member of Women in Science, Technology, Engineering and Mathematics (WInSTEM) at the School of Computing and Engineering at UWL, where she actively contributes to encouraging women to pursue careers in STEM subjects.

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Supervisors:

Professor Amir M. Alani and Professor Fabio Tosti

Professor Amir M. Alani is Executive Dean of the School of Computing and Engineering, University of West London

Professor Fabio Tosti is Professor of Civil Engineering, University of West London