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Sci-fi movies 101: an international online collaboration and research-led production (starring robots)

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Abstract

This paper discusses an example of global media production in an educational context that is also a model for online intercultural exchange. We investigate the process of an international, research-led film production project between two universities, RMIT University, Melbourne Australia and the State University of New York, Oswego campus, USA (SUNY Oswego).

The aim of this paper is to investigate how teams that are geographically, academically and culturally diverse may engage in a process of research-led learning. We discuss important issues in the emerging field of online collaboration, as they relate to practice and pedagogy in both higher education and industry. We offer some basic guidelines for methods and practice in global online collaboration. We conclude that hybrid techniques which blend virtual and "real" or face-to-face classroom techniques may be most useful in producing exciting screen research and production outputs.

Introduction

Instructors from SUNY Oswego developed a *Transhumanism* course as an innovative multidisciplinary course in computer science, film production and science fiction. As part of the materials used in this course, the collaborators built an online depository of readings and resources. This online course depository became the basis of an international collaboration with RMIT University that included online and face-to-face components.

Using simple online methods, three instructors (Damian Schofield and one other in USA, Lisa Dethridge in Australia) taught *Transhumanism* by including topics from the disciplines of media production, screenwriting, computer science, literature, cognitive science, robotics, philosophy, artificial intelligence, interface design and psychology. Twenty-five Masters of Human-Computer Interaction students in the USA and fifteen Australian Masters of Media students used this course as the basis of a science fiction screen production. They collaborated online and face-to-face on the research and production of three short science fiction video narratives. One special aspect of the film scripts was the use of robots as characters to be programmed by students. The unifying theme of the collaboration was how to understand and represent robotic life and intelligence on screen.

Students engaged in working conversations with international counterparts, and even with robots. They gained a new sense of cross-cultural competence that we suggest is a key result of global collaborations.

Globalisation in education

With increased pressure to establish global competence among staff and students there is much discussion in university circles about processes of globalisation. In this context, technology is seen as a tool that can "strengthen institutional global engagement through meaningful international collaborations for faculty and staff" (Helms et al. 2015, 2; ACE 2016, 1)

Both Australia and the USA have government-led internationalisation programs that focus on higher education. Staff, instructors and students are under pressure to become adept with a variety of online forums and platforms that allow the discussion and exchange of ideas (Derouin et al. 2004).

Studies like this one are useful because educators must deal with a rapidly shifting social and immigration context to prepare learners for work in a global marketplace. This requirement puts increased pressure on both educators and students to gain cross-cultural competence. The same pressures apply in the international media industry. For example, international advertising agencies (such as Mystery Box, Mekanism etc.) operate non-stop production studios that are producing for global clients seven days and nights a week.

It is not surprising that higher levels of ability in teachers/trainers correlates with higher levels of student achievement and motivation (Schweizer 2004). It is important then that teachers gain knowledge and experience of various methods of online and blended teaching as part of staying ahead. The use of online tools is increasingly changing the interaction between instructors and learners (Servage 2005). This challenges education curriculum managers who must re-focus teacher training and resources within often slow-moving bureaucracies.

The requirement for a wide range of digital skills in global media industries led the authors to the international collaboration, to address this need. This paper describes some of the activities that were constructed to ensure our students were introduced to as wide a range of technologies and skill sets as possible. The international nature of the collaborative learning meant the authors had to make use of e-learning, video conferencing and social media technologies to facilitate student learning.

Description of collaboration

The collaboration involved multiple international student learning experiences using a mixed-delivery methodology. The main objective of the global co-production project was to develop enough understanding of science, science fiction and media to produce credible short scripts on themes of transhumanism. Their research would be used to produce short science fiction videos, where leading roles would be played by robots.

This innovative, research-led production course was run collaboratively between two academics at the SUNY Oswego, USA and one from RMIT University in Melbourne, Australia. The course was aimed at Masters level students in both countries and tackled the emerging field of transhumanism. Students collaborated to research and produce a range of outputs including essays, blogs, screenplays, interface designs, robotic effects, science fiction movies and a documentary about the collaboration.

The course had 25 American and 15 Australian student participants. Their international collaboration took place online and face-to-face over six weeks. The Melbourne and New York student groups were already working together on other projects and knew their own "local teams" before they entered the international collaboration. Before meeting face-to-face, the international team of Australian and American students had three weekly online conferences which established friendly relations, had worked together on small research projects, and had developed a pre-production agenda of themes for the production of screenplay material. The overseas collaboration is described more fully in the Study Abroad section of this paper.

We used online synchronous (same time) and asynchronous (different time) tools as well as a dedicated online learning platform. We structured conference time so that one third of class time was spent in lectures, one third in structured writing or question/answer activities and one third in group discussion. The virtual face-to-face contact simulated by video conferencing allowed students to establish more personal contact. After their initial online meetings, the students in our study soon formed their own groups based on common interests. Collaborative assignments focused on deliverables related to the themes the students had selected. For example, one group researched and wrote about the idea of a technological singularity, another group wrote a dialog on the problems of generalised artificial intelligence.

The project shifted to "real world" presence when a cohort of the American students flew to the RMIT campus, allowing real face-to-face collaboration between the two student cohorts in Melbourne.

In our experience, the blending of online and face-to-face meetings worked on multiple levels. Staff and students increased their familiarity with a range of media production tools: including cameras, editing systems, social media platforms, artificial intelligence applications and robots. For example, working with the American students allowed the Australian media students access to a highly specialised science research that will equip them well in future. The Australian media students stated that many of them changed their perception of the world as they learned about future technologies and the way society is going to change over the coming decades. The American *Transhumanism* students gained valuable knowledge in filmmaking and genre that helped them with their video production.

The video outputs

The American group returned to USA after the group had compiled their research. Three teams of RMIT media students each wrote a science fiction script based on their group research. The larger teams then re-grouped online to discuss the scripts and exchange storyboards. The American students began programming the robots and shooting the short science fiction videos. The Australian students produced a five-minute video documentary about the entire project. (www.youtube.com/watch?v=_

Ck09902eok)

The three short science fiction films all starred robots but had very different plots. Rob ot is a black comedy about a woman whose husband dies so she replaces him with a robotic husband. (*Rob ot* : https://www.youtube.com/watch?v=7SFPS3ootLo)

Johnno and M8 is a comedy about an Australian man who wins a robot in a science competition and treats him as a mate, much to the robot's confusion. (*Johnno and M8* https://www.youtube.com/watch?v=2_7PyQ3oz4g)

In the third video, two androids contemplate the idea of being human in a tragi-comic scene adapted from the seminal Philip K. Dick story *Do androids dream of electric sheep*? (*Do Androids Dream*? https://www.youtube.com/watch?v=aVBeplOKC6M)

The transhumanism course, based on the model described in this paper, has been run twice now, once in 2013 and once in 2015 – it is planned to run the course again in 2017. Each time the course has followed a similar path and timeline through the academic year. The course ran smoothly in its first iteration, minimal changes were made to the format when the program was run for a second time in 2015. One of the only changes was that the program was run by the authors without the third academic from SUNY Oswego assisting, this was due to conflicts in the department teaching schedule.

Table 1: Timeline through the Academic Year

October / November	Planning stages, apply for institutional permission to run study abroad components
February	Transhumanism graduate seminar begins at the State University of New York, USA
March	Media course begins at RMIT university, Australia
April	Interactive online collaborative learning sessions – initial script ideas are generated
May / June	Study abroad – American students visit Australia, face-to-face collaboration – shooting scripts are finalised
July / August	Film production / shooting in the USA
August / September	Website production / online versions of films

Issues and challenges of global collaboration

The constant evolution of web-based systems and devices means that global teams will always face technical issues when relying on technology. (Hill 2002; Bates 2005). Our team remained determined to see challenges as opportunities for learning. A few of the issues encountered in this project are discussed here and relate to the use of a learning management system, to the context of Study Abroad and to the multiple contexts of multidisciplinary research.

Study abroad

At the end of their three-week online interaction, a group of seven students from the SUNY Oswego travelled to Melbourne, Australia to work in person with students from RMIT University. We did not treat this as a formal exchange, which would require onerous paperwork across the upper reaches of both university administrations. The global travel part of the collaboration was structured as a relatively simple and informal study tour. This meant there was no need for us to engage in complex adjustments to any curricular requirements. Both groups elected to keep within the already established framework of their own curriculum.

We also opted to leave assessment to the usual parameters of each national group. This avoided any issues around grade disparity, and reporting learning outcomes.

Study abroad by American students has more than tripled in the last two decades, reaching a new high in 2015 of 304,467. It is customary to hear students describe these experiences as "life changing," but up until recently there was little empirical evidence to support this view. It is well-established that students who study abroad have greater intercultural proficiency, increased openness to cultural diversity, and become more globally minded than those students remaining in a traditional campus setting (Salisbury et al. 2009, Paige et al. 2009, McLeod and Wainwright, 2009, Anderson et al, 2015, Tarrant et al, 2014, Salisbury et al, 2013).

In summary, over the course of this project we learned a lot about the processes of integrating a study abroad component into a collaborative online learning experience. The students who travelled to Australia all reported (when interviewed) that their world view had shifted during the course. Many were already thinking about their next trip overseas, and were potentially aiming to work overseas. A number of these comments were reported in the documentary video created by the students at RMIT (https://www.youtube.com/watch?v=kpnnXrPbS5I).

Multidisciplinary project

A further challenge was the multidisciplinary nature of the project, which we framed as an opportunity from the start. The students had a range of academic backgrounds (science, art and humanities). All participating students studied subjects from disciplines outside their usual curriculum stream. Further, they were taught by three instructors, each with their own distinct background and knowledge area (computer science, English/philosophy and media/writing).

During the first induction conference, instructors made many statements to students about the value of multidisciplinary research. We also made reassurances that confusion was often normal in such enquiry and that we were all stretching ourselves beyond the comfort zone of our individual disciplines. The instructors repeatedly commented that they felt like students, learning new material from other disciplines – the students often seemed reassured by this, knowing they were not alone in exploring new areas.

Research has shown that multidisciplinary teams may encounter problems, which can be detrimental to productive co-operation, which in turn may diminish educational quality (Stalmeijer et al. 2007). The negative effects of the different disciplines on team processes and course quality and the well-established positive association between psychological safety and team learning suggest that educational quality might be improved by enhancing the students' feeling of security and safety.

Our students were keen to explore multiple disciplines and cultural frameworks. What began as an initial interest to exchange views on food, movies and culture in their respective homelands grew into an active interest in the exchanges possible between various discipline areas in arts and sciences. Computer science students enjoyed learning how to write science fiction. Media students enjoyed learning the theories of artificial intelligence.

The study of transhumanism allowed the group to explore the potential of the two NAO robots owned by the SUNY Oswego. These are sophisticated, configurable, programmable devices that have been used in research all over the world. Students wanted to depict issues raised by their group research. For instance, the videos show robots puzzling over human traits and use humour to illustrate how complex this territory can be.

The resulting written and verbal exchanges on transhumanist philosophy made for lively and provocative cross-disciplinary class discussion. Students raised a range of questions that drew mystification, laughs and unexpected and insightful responses from the group. The students were extremely engaged, discussing a range of topics from head transplants to cybernetic implants, from science fiction literature to artificial intelligence predictions.

One thing that was of particular interest was the way that some students sought to ratify their own belief systems through the discussions. A number of the students had very different views forged by differing cultural upbringing and, while being respectful, they often had very different views on the moral and ethical implications of technological developments and the societal implications of these advances.

On balance, the multidisciplinary education approach was considered by both course organisers and students to have a significant impact on the understanding and modes of interaction with the materials of the course.. It was perceived to have a positive impact on the development of personal and professional confidence; to enhance mutual understanding; to facilitate inter-professional communication; and to encourage students with narrow academic experience upon which to draw to reflect upon a broader range of topics and disciplines.

Cross-Cultural Competence

We all face challenges to personal identity in the course of our civic, social and work life. Students, educators and industry practitioners must come to terms with cultural pluralism both in the academy and in the larger culture (Bennett 1986).

Understanding that our multidisciplinary participants crossed a range of cultural competencies, our goal was to provide them with tools that would allow the most streamlined and "friendly" of collaborations. Film production is traditionally a creative process based on consultation, negotiation and decision-making whereby individuals and teams make collective decisions. Therefore, we needed a mechanism to allow students to interact. Initially this interaction was organised around icebreaker sessions and structured activities, but it naturally progressed into student-led communication and collaborative work.

We provided a range of social and communication tools to accommodate a range of learning styles and communication forms, letting the students organise themselves accordingly. In this way, we felt that the form of the communication was perhaps more important than the content. Such a diverse group was able to communicate successfully across a variety of boundaries. This experience may demonstrate the potential for multidisciplinary, trans-global, online collaboration.

The online learning management system allowed students to submit questions and comments that received individual attention from colleagues and instructors. In the process, students developed skills in written expression and questioning that involved various degrees of cross-cultural competence. For instance, computer students may need to re-contextualize their usual terms or re-phrase complex technical concepts into everyday language. Online forums and meetings (created and run by the students) allowed students to review and revise materials while working across cultures in an international context. Observing the students, it was apparent that they felt comfortable with the control they had and were able to self-regulate their collaboration.

When students arranged to meet for more "facetime" in the learning management system (or using Google Hangouts, Facebook or Skype), they increased their sense of personal familiarity by reading voice tone, facial expression and body language that are all part of trust-building. They were then able to follow-up on these impressions by engaging in more in-depth discussion online using responses to readings and a more careful composition of questions and answers.

Students in this global project used English as the central code to engage in a process of negotiation where they learned important aspects of cross-cultural competence. There is a lot that can go wrong in all this despite Google translate and other aids. Quantitative studies concerning culture and language in global projects suggest that online environments can potentially amplify national differences that exist between virtual team members in a negative manner. The data shows that cultural intelligence has a strong impact on performance and that virtual teams who use a common language consistently are more satisfied (Lauring and Klitmoller 2014).

In summary, the concept of cross-cultural competence is difficult to pin down because what is required is not a measure of cross-cultural knowledge, skills, and attitudes but a measure that assesses the appropriate and effective use of cross-cultural knowledge, skills, and attitudes in an academic context.

Assignment evaluations by a faculty member are relevant to the student's academic performance, but cultural competence and social interactions with others need to be assessed both in and out of the university environment. This includes the ability of students to perform project-related tasks such as planning, organising, and delegating. Social interactions reflect an orientation to others or an 'emotional connection' to others that can be positively correlated with successful cross-cultural adaptation; social interactions also include the ability to manage the emotional conflicts caused by polycontextuality. An adequate measure of cross-cultural competence among our students should, therefore, capture these multiple dimensions of their performance over the life of the project.

Summary of Global Collaboration Issues and Challenges

This example of global media production provides a simple model for complex intercultural exchange. There were several layers of "culture" to be crossed including national boundaries, discipline boundaries, programming and species boundaries of the human and the machine variety. For example, students had to research and program robots for their science fiction videos, raising technical and conceptual questions for their global production process.

However, this complexity was manageable because of the combination of simple communication tools and blended learning. We used face-to-face encounters as a foundation for intensive online research and discussion. We ensured all students had access to a plethora of online research materials and gave them independence when it came to self-organising their online group discussions.

This complex multidisciplinary learning environment meant that students soon conquered their confusion and became more culturally competent. They recognised the ambiguous and shifting nature of context on many levels, from the real to the virtual, across time and space, science and art. This enables students to make a considered response to alternative opinions based on "qualitative judgments and critical thinking: as opposed to bias or habit." In short, they become more competent at collaborative activities that cross national and cultural borders (Bennett 1986).

General Guidelines for Online International Collaboration

Reflecting on observations made during this study of this global online collaboration, the authors suggest a few key points are worth noting. In a global classroom, there is often confusion. In multidisciplinary research, there are often no clear answers; no clear sense of "right and wrong", just a lively debate. Despite the complexity of the research context, the use of simple tools and flexible procedures provided a clear pathway to solutions.

We suggest online global collaboration needs to focus on personal interaction first, and above all else. This allows essential human aspects of trust, humour, familiarity and curiosity to develop. Further, we emphasise that global online collaborations need not be as complex as the one outlined here. It is relatively easy to use low-cost technology to provide global learning opportunities to increasingly diverse student populations.

We are not focused on any particular technological solution. A readily accessible and navigable central source for learning materials and readings is a useful starting point. Nor are we advocating student travel as an essential part of the project. Students are capable of self-organisation with international collaborators across a variety of platforms that they are already familiar with.

From our experiences we offer the following guidelines to clarify some methods and create opportunities for practice:

- Successful online learning requires a supportive organisational climate where faculty are able to integrate organisational change with change to the curriculum (Welsh et al, 2003).
- Avoiding administrative overheads, where appropriate, can streamline the arrangements of international collaboration and study abroad opportunities.
- There is a need to have faculty who know and trust each other, and if possible have worked together in the past. The two authors are former colleagues at RMIT, and had a trusting, working relationship before this collaboration. We shared assumptions about what it meant to empower students in an online context and therefore were able to avoid internal differences based on pedagogy or process.
- Media production requires freedom of expression and discussion so the communication tools need to encourage the independence of participants and allow them to self-organize.
- Access to a learning management system that the faculty can control and configure can be a great help. The same resources should be provided to both groups of students to foster the sense of shared learning.
- While the technical solutions, and learning management system used, may be low-cost and off-the-shelf there is little that is “cheap” about planning for students’ overseas travel. Global mobility is an expensive solution that may be offset by “internationalisation at home”. In this arrangement, teleconferencing tools are used to simulate “presence”. In this case even the students that do not physically travel all report they felt they had an “international” experience in this class.
- Simple online communication methods, such as popular social media platforms should be encouraged. Letting the students use technology they are comfortable with leads to them engaging more readily in a process of research-led learning, mediated by the technology they choose.
- Ensure you have good technical support. Technology can always cause problems when you least expect them. Also learn to flip to a low-tech solution, such as Skype, if needed.
- Support staff with backgrounds in IT, graphics and multimedia should work alongside faculty who have a strong grasp of the various online channels, tools and materials now available to researchers.
- Another cost associated with collaborative international online learning relates to the extra work that needs to go into preparing course materials and resources. Faculty may also need to set aside time during weekends and evenings in order to make international meetings due to time differences.

- The video-conferenced meetings between participants on opposite sides of the globe are essential to break-the-ice and create bonds.
- Time zones (in this case 14 hours between the USA and Australia) can be a problem. Students need to be flexible with their overseas partners; to arrange times in the evening or early morning beyond class schedules.
- Using a common spoken/written language that is shared by most team members will facilitate the exchange.
- Keep it fun. All the of the faculty involved in the *Transhumanism* class rated this particular course as one of the most enjoyable they have ever taught – even with all the extra work involved in running something so complex. This enthusiasm passes on to the students and the feedback from the students on this class was extremely good – with the international collaboration being highlighted as one of the most enjoyable aspects.

Conclusion

This paper has described how using simple online methods, with a core group of around 40 Masters level students collaborated to produce three short science fiction films using programmable robots as characters. The team also produced a short video documentary, which includes student commentary, about the collaboration itself. They learned much about how to understand and represent aspects of transhumanism theory, including artificial life and intelligence on screen.

The exercise allowed students to demonstrate many forms of cross-cultural competency where the participants worked across borders of geography, culture and academic discipline. They explored the relationship between humans and our technological extensions using tools including cameras and robots. They used an online learning management system in addition to familiar online social media applications to engage in a process of research-led learning. Most importantly the students learned how to manage a blend of synchronous and asynchronous methods to schedule and manage regular online exchange and debate to foster a strategic online partnership.

The aim of this paper was to report on how teams which are geographically, academically and culturally diverse may engage in a process of research-led learning. The paper has discussed and described a number of important issues in the emerging field of international education (both online and face-to-face) and offered a number of basic guidelines for methods and practice in global online collaboration. The process discussed here certainly provides a model that may be useful for collaborative screen practice as a means to produce exciting film research and production outputs that go beyond traditional academic outputs.

Yuen and Yang (2009, 460) state that there has been a shift from the web as a medium where content is transmitted and consumed, into a platform for student-centred work where "content is created, shared, remixed, repurposed and exchanged." Accordingly, we created a virtual online environment that contained a number of flexible web-based tools allowing students to communicate in a variety of forms, to edit and updates entries, to videoconference with each other and exchange information easily.

We agree with Yuen and Yang (2009) in constructing a pedagogical framework that supports the creation and management of project goals. This example of an educational project involving global media production provides a simple model for handling multiple, complex layers of interaction. Online systems are powerful tools in the pursuit of production goals as they can offer both instructors and students a flexible means of linking material and comments.

In general, this framework allows students to evolve from a focus on individual tasks to a higher level of awareness that involves not only questions from outside their own field but also questions about the nature of creative collaboration itself. They gain a crucial understanding of factors that will be common to global collaborations in any industry, not just media production. The students learn to negotiate the challenges and obstacles associated with shifting global time zones and with the shifting digital universe of online communication tools and platforms.

We agree with Sloman and Reynolds (2003) that online collaboration is often constrained by limitations in the technology. We also suggest that the model and guidelines offered here may be generalizable across other contexts. While the transhumanism content of this project was particularly complex, the course was successful because the interaction tools were organised to allow for simple and flexible, low-cost communication. Emphasis was taken off the technology and placed on the facilitation of intelligent interaction and discussion as the main priority. We hope to see more colleagues and collaborators undertake similar, exciting projects in their own classrooms and production studios.

The State University of New York and RMIT University have recently entered into a formal partnership and both the authors and the intuitions are intent upon continuing this activity. The agreement is under the auspices of the SUNY Centre for Online International Learning which is a world leader in the field. (COIL, 2016) The authors hope to scale-up the collaboration, which has fulfilled our initial needs to internationalise the student experience.

Such global collaborations raise new interest among both industry practitioners and researchers in international measures of quality and impact. All the students worked harder, knowing their work would reach an international audience. The instructors involved are also keen to disseminate their experience and results to a wider audience.

All of this suggests some larger implications for the epistemology of learning, including the importance of cross-cultural competence, and international multidisciplinary education. This provides a myriad of potential subjects for future research and pedagogical study. Future research may be needed to consider all stakeholders' experiences of collaborative, online international experiences, especially as "the learner's voice is often significant by its absence in the debate" (Sloman and Reynolds 2003).

In conclusion, all of the students who took the *Transhumanism* course become more sensitive to a variety of cultural parameters, including human and machine language, custom, and the various frameworks associated with different academic disciplines and industry areas. We suggest that teaching screen production within a research-led learning environment may enhance our ability to create inspiring international stories and to enhance international employment opportunities and learning experiences for students.

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