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Article

Cultural respect encompassing simulation training: being heard about health through broadband

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Significance for public health

There are significant health inequalities for migrant populations. They commonly have poorer access to health services and poorer health outcomes than the Australian-born population. The factors are multiple, complex and include language and cultural barriers. To address these disparities, culturally competent patient-centred care is increasingly recognised to be critical to improving care quality, patient satisfaction, patient compliance and patient outcomes. Yet there is a lack of quality in the teaching and learning of cultural competence in healthcare education curricula, particularly in rural settings where qualified trainers and resources can be limited. The Cultural Respect Encompassing Simulation Training (CREST) program offers opportunities to health professional students and practitioners to learn and develop communication skills with professionally trained culturally and linguistically diverse simulated patients who contribute their experiences and health perspectives. It has already been shown to contribute to health professionals' learning and is effective in improving cultural competency in urban settings. This study demonstrates that CREST when delivered via live video-streaming and simulation can achieve similar results in rural settings.

ing and simulation can contribute to health professionals' learning and is effective in improving cultural competency. CREST has the potential to be embedded within health professional curricula across Australian universities to address issues of health inequalities arising from a lack of cultural sensitivity training.

Introduction

Global migration is a world-wide phenomenon. In Australia, migration has gradually increased since 2005-6. In 2013, Australia was ranked no. 9 as the destination of choice for migrants.¹ In June 2014, 28% of the Australian population or about 6.6 million people were born overseas, the highest in 120 years, and culturally and linguistically diverse (CALD) populations made up a significant proportion.² CALD migrant and ethnic minority groups commonly have poorer access to health services and therefore poorer health outcomes than the Australian-born population. The factors are multiple and complex, including language and cultural barriers such as limited awareness of the Australian health care system, differing health beliefs, poor access to services, loss of family support system, social isolation and other social determinants of poor health.³⁻⁷ To address these disparities, culturally competent patient-centred care is increasingly recognised to be critical to improving care quality, patient satisfaction, patient compliance and patient outcomes.^{8,9}

There are many definitions of cultural competence. One of its first definitions captures the central concept and value: *cultural competence is a set of congruent behaviours, attitudes, and policies that come together in a system, agency or among professionals and enable that system, agency or those professions to work effectively in cross-cultural situations.*¹⁰ Cultural competence is not an end-point but a process that incorporates ongoing learning and realisation as a practitioner acquires skills and makes the connection between *thinking* and *doing*.¹¹ Culturally competent patient-centred care focuses on the individual patient and his or her cultural differences, knowledge level, needs, values, preferences, and the provision of *respectful, responsive, assistive, supportive, facilitative, enabling* individualised clinical care that is guided by the patient.^{8,12}

The teaching and learning of cultural competence in health professional education curricula have traditionally been haphazard, lacking uniformity across the outcomes measurements, limiting in implementation, and focussing on theoretical rather than experiential learning.¹³ Furthermore, the ability for medical students to communicate effectively with patients from different language and cultural backgrounds is acknowledged internationally as a desirable graduate attribute.¹⁴⁻¹⁷ Health professionals require skills to communicate competently and sensitively with an increasingly diverse range of migrant patients and yet there are limited opportunities for culturally specific

Abstract

Background. Cultural Respect Encompassing Simulation Training (CREST) is a learning program that uses simulation to provide health professional students and practitioners with strategies to communicate sensitively with culturally and linguistically diverse (CALD) patients. It consists of training modules with a cultural competency evaluation framework and CALD simulated patients to interact with trainees in immersive simulation scenarios. The aim of this study was to test the feasibility of expanding the delivery of CREST to rural Australia using live video streaming; and to investigate the fidelity of cultural sensitivity – defined within the process of cultural competency which includes awareness, knowledge, skills, encounters and desire – of the streamed simulations.

Design and Methods. In this mixed-methods evaluative study, health professional trainees were recruited at three rural academic campuses and one rural hospital to pilot CREST sessions via live video streaming and simulation from the city campus in 2014. Cultural competency, teaching and learning evaluations were conducted.

Results. Forty-five participants rated 26 reliable items before and after each session and reported statistically significant improvement in 4 of 5 cultural competency domains, particularly in cultural skills ($P < 0.05$). Qualitative data indicated an overall acknowledgement amongst participants of the importance of communication training and the quality of the simulation training provided remotely by CREST.

Conclusions. Cultural sensitivity education using live video-stream-

communication training at the undergraduate and practice levels. For example, in an international study conducted by final year medical students and junior doctors, the authors point out that many junior doctors undertake internships in inner city hospitals where mediated communication through interpreters is common.¹⁸ The authors also comment that despite this diversity, their medical education offered limited opportunities to develop intercultural communication skills; medical curricula did not always reflect the cultural and social diversity of patients that they encountered in their training and practising environments. This problem is also acute in rural migrant destination settings where health professional graduates interact regularly with CALD patients but lack access to training resources and programs with appropriate methodologies to develop their skills.

Teaching cultural respect through CREST

The Cultural Respect Encompassing Simulation Training (CREST) program is a cultural sensitivity training in communication program that addresses the dearth of authentic and culturally appropriate resources and methodologies for communication training in health-care education. In particular it addresses the chronic shortage of professionally trained culturally and linguistically diverse (CALD) simulated patients (SPs) who can contribute their experiences and perspectives to health professional education. Simulation in health professional education is widely recognised as an effective learning and teaching strategy to provide learners with meaningful learning experiences.¹⁹ It is particularly important for developing communication skills and is used extensively in assessments such as the Objective Structured Clinical Examinations (OSCEs), which test clinical skill performance and competence using simulation with either impartial examiner(s) and either real or simulated patients.

CREST consists of five cultural sensitivity training modules which use a rigorous cultural competency framework based on Camphina-Bacote's Cultural Competence Process Model for, but not limited to, the medical, nursing, physiotherapy, social work and paramedic disciplines.²⁰ Cultural sensitivity is defined within the process of cultural competency described in the model which includes awareness, knowledge, skills, encounters and desire. Module 1 is an overarching module and introduces the concept of cultural diversity and the importance of cultural sensitivity in provider-patient communication. Modules 2 to 5 then progressively introduce more complex concepts (Figure 1). Communication tools are introduced gradually over the 5 modules and learners are given opportunities to peer practise these new skills before undertaking immersive simulations with trained CALD SPs. These immersive simulations have been designed to achieve the learning outcomes of each module.

CALD SPs from 18 ethnic groups (Asian, African, middle eastern, European, and also Aboriginal) were recruited and trained to portray patients in authentic and individualised immersive simulation scenarios co-created with each SP. These SPs were trained to interact with and provide feedback to health practitioners, tutors, supervisors and students. CREST has been developed to be capable of delivery via face-to-face, on-line or video link-up. The CREST website (<https://edtech.le.unimelb.edu.au/login/crest/>) uses scenario videos developed specifically to illustrate each module's learning objectives. Unique access codes allow health educators, practitioners and students different levels of access to content materials and resources. Delivery via video link-up may use either SPs or scenario videos. The CREST modules have been used and evaluated extensively in over 6500 trainees, including medical, nursing, paramedical, physiotherapy and social works students and practitioners at tertiary institutions, hospitals, training agencies and professional associations, through face-to-face sessions and to over 1100 trainees through on-line settings in 2013-2014. Evaluation findings indicate that they significantly improve cultural competency.

In contrast, the video link-up capabilities had not been tested. The interactivity of learner and SP is a critical outcome in the CREST modules. Using video link-up, the learner could view the SP for non-verbal nuanced communication cues and receive immediate and individualised feedback. This is the hallmark of immersive simulation that needed to be facilitated. Given the lack of access to quality training and resources in cultural competence in healthcare education curricula in rural settings, it makes sense to test the feasibility of expanding the delivery of CREST to rural Australia using live video streaming.

There are a number of challenges with using video link-up including internet connectivity, access to IT support, hardware and software compatibility. These issues are common even in tertiary education institutions. The lack of bandwidth or an unreliable Internet connection in rural and remote areas is often perceived impacts on streamed video data which is an important component of CREST. Difficulties in downloading files or viewing the scenario videos on-line as a result of unclear audio and dropped connections will compromise learning outcomes and student satisfaction. Crucially, the audio-quality is imperative for patients and trainees whose first language is not English for their mutual comprehension of accented speech.

Aims

To provide cultural sensitivity simulation training to rural health professional students and practitioners to develop their communication skills using live video streaming and simulation.

Research questions

- i) What is the feasibility of expanding the delivery of CREST to rural Australia using live video streaming and simulation for communication skills training of health professionals?
- ii) What is the cultural sensitivity of the streamed interactions between CALD SPs and trainees?

Design and Methods

A mixed-methods quantitative and qualitative research design was used. Ethics approval was provided by the Human Research Ethics Committee at the University of Melbourne (ID no. 1238952.4).

In 2014, four sites – three rural academic campuses and one regional hospital in the State of Victoria – were identified with diverse health professional trainees (nursing and medical students and junior practitioners at different stages of their training) to allow comparison of delivery from a central location (in Melbourne). The sites were purposively selected because they were located in areas of ethnically diverse rural populations and they broadly represented different campus sizes. This enabled evaluation of different technological capabilities to facilitate content delivery in different conditions and situations. Health pro-

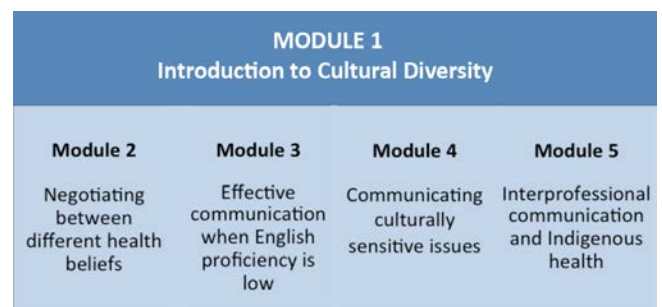


Figure 1. Overview of Cultural Respect Encompassing Simulation Training modules.

professional trainees were invited to participate in the workshops and in the evaluation of the workshops, and the workshops were delivered by the CREST team and SPs.

The project consisted of 5 stages.

Stage 1: technical scoping

The internet connection, infrastructure and technical support at the 4 sites were mapped to identify gaps and potentials, including broadband speed, network connectivity, video-conference equipment, computer capacity, distributive system, sound quality of equipment, types of learning environment (e.g. lecture theatre), and technical support. The research team visited each site to assess and survey the environment with the site technical support person to collect the above information.

Stage 2: testing the sites

Based on the gaps and potentials identified in Stage 1, a skeleton framework was implemented around the CREST modules with some key content such as the video data. Working closely with the Australian Broadband Applications Laboratory (ABAL), the videoconference capabilities of each site including configurations and competence of the systems available were tested and evaluated. Test videoconference runs were conducted between the city campus and each rural site.

Stage 3: upgrade and modify the sites

Based on the results from Stage 2, the 4 sites were modified accordingly with the assistance of the technical support person at each site. Modifications included using different internet/videoconference platforms, devising ways to respond to image and sound dropouts, adjusting sound and lighting levels, re-positioning the cameras and changing the room format.

Stage 4: pilot

Health professional trainees were then recruited at the 4 sites to pilot the CREST modules using live video streaming and simulation. Cultural competency was measured before and after each video-streamed CREST session using a survey with 26 reliable items selected from existing assessment tools and represented the 5 domains in the Campinha-Bacote model of cultural competency: cultural awareness, cultural knowledge, cultural skills, cultural encounters and cultural desire.²⁰ A rigorous process was followed during the development of this survey. As yet unpublished work by the CREST team has shown that the CREST survey is reliable, valid and sensitive in detecting differences in the various cultural competency domains. Teaching and eLearning evaluations were conducted at the end of each session using a second survey with 19 items and 3 reflective questions. The items in these evaluation tools are listed in Supplementary Tables S1 and S2.

Field notes were also taken by the presenter, observers and facilitators at each end after the sessions.

Stage 5: analysis and report

Results from Stage 4 were analysed to identify any further gaps and potential. Paired two-tailed student t-test was performed on the cultural competency differences before and after each session. The quantitative data from the Teaching and eLearning evaluations was used predominantly for descriptive purpose while the qualitative data was thematically analysed using an inductive approach.

Quality of connection, infrastructure and technical support were assessed by the team as the project progressed and modifications were carried out wherever appropriate.

Results

Internet and broadband capabilities of the 4 test sites

These were varied and ranged from basic facilities to high speed/high bandwidth dedicated networks and clinical skills laboratories that provided local *real* and simulated settings for teaching. Our initial technical scoping and testing found that the technical infrastructure and capabilities of our rural sites are readily available and are of a very high standard, particularly at one of the rural clinical schools. Conversely, several gaps were identified in the videoconferencing facilities at the city campus, the location from which the teleconferencing was delivered. The two main gaps were a lack of suitable videoconference rooms for conducting simulation sessions and a lack of uniform videoconferencing capacity throughout the campus. Although a video-conference unit was subsequently installed to be used at the Department of General Practice at the city campus to try to alleviate these issues, technical compatibility with different systems at different sites remained an issue.

Pilot and evaluations

We conducted 6 videoconference sessions at the 4 sites. A total of 45 participants were involved – 8 males, 37 females; 28 first year nursing students, 10 second year medical students, 7 medical practitioners; average age 24 years old (range 18-52, median 23). The session size ranged from 2 to 19 participants. About 2/3 were first-time users of a video learning resource incorporating streamed simulation. Half reported experiencing technical difficulties, 2/3 indicated that IT support was available on-site and about 1/5 said there was no on-site IT support.

Results from the cultural competency evaluation and the Teaching and eLearning evaluation

Cultural competency

Participants rated 26 reliable items representing 5 domains of cultural competency on a likert scale of 1=totally disagree to 5=totally agree before and after each session. Participants reported statistically significant improvement in 4 of 5 domains, particularly in cultural skills, followed by encounters, knowledge and awareness. There was minimal change in cultural desire, which is the *desire to want to engage in the process of cultural competence*.²⁰ Table 1 shows only the items that were statistically significant.

Teaching and eLearning

After each session, participants were similarly asked to rate various statements on a likert scale of 1=totally disagree to 5=totally agree. The responses were strongly affirmative with mean scores ranging between 4.2 and 4.8 for teaching quality and between 3.9 and 4.4 for learning experience.

Responses indicated that participants felt that the subject matter was relevant to their discipline and that the simulated patients were authentic and enhanced their understanding. They also thought that the learning environment was conducive, the subject matter was clearly presented and they felt prepared to interact with people from different cultures. There was high agreement that the quality of sound and picture and the speed of the video streaming did not compromise learning. Table 2 shows the descriptive quantitative results of the Teaching and eLearning evaluation.

Participants' reflections

Themes and subthemes elicited from participants' reflections are listed in Table 3.

Table 1. Statistically significant items in the culturally competency evaluation.

Item	Mean pre	Mean post	diff.	P-value
Cultural Knowledge				
In providing care to patients, sociocultural background impacts patient-provider relationship				
Trust in provider	4.0	4.4	0.4	<0.001
Rapport with provider	4.0	4.4	0.4	<0.01
Provider's treatment recommendations	3.7	4.3	0.6	<0.0001
In providing care to patients, sociocultural background impacts patients' health behaviours				
Patient's health beliefs	4.3	4.7	0.4	<0.01
Patients' health care utilisation	4.2	4.6	0.3	0.02
In providing care to patients, sociocultural background impacts health status				
Severity of disease at initial diagnosis	3.4	3.8	0.4	0.01
Survival rates	3.6	4.1	0.5	0.01
People from different cultures may define the concept of healthcare in different ways	4.2	4.6	0.4	<0.01
Cultural awareness				
Learning about alternative/non-Western medicine and traditional healing practices is an important part of clinical training	3.8	4.2	0.4	<0.001
Cultural skill				
In conversations, I am attentive to nonverbal cues and culturally specific gestures	3.7	4.1	0.4	<0.001
I can communicate sensitivity, respect and cultural competence in caring for cultural diverse populations	3.9	4.2	0.3	0.02
I am able to identify beliefs, sources of health information, health care access of culturally diverse populations	3.5	3.9	0.5	<0.001
I can work with interpreters in an effective manner	3.4	3.7	0.2	0.02
I can incorporate culturally relevant information into a treatment plan for a patient	3.5	3.9	0.5	<0.001
Cultural encounters				
When I come in contact with individuals from another culture, I adapt my behaviour in accordance with my understanding of their culture	3.9	4.1	0.2	0.04
I am able to demonstrate cultural sensitivity	4.1	4.4	0.3	0.01

Table 2. Teaching and eLearning evaluation.

Teaching and Learning items	Mean (CI 95%)	Range
The subject matter was clearly presented in the session	4.4±0.4	2-5
The subject matter was relevant to my discipline	4.8±0.2	4-5
The teacher created a conducive environment for learning	4.5±0.3	3-5
The simulated patient enhanced my understanding of the relevance of culture in healthcare practice	4.6±0.3	4-5
The simulated patient seemed authentic to me	4.7±0.2	4-5
I feel better prepared to interact with people from cultures different to my own	4.2±0.4	2-5
eLearning items		
I found the resource easy to use	4±0.4	3-5
I found it easy to navigate around the resource	3.9±0.4	3-5
I found it enjoyable to use the resource	3.9±0.3	3-5
I found it easy to find the information I needed	4.1±0.4	3-5
I found the quality of the video picture did not compromise my learning	4.3±0.5	2-5
I found the quality of the video sound did not compromise my learning	4.4±0.4	3-5
I found the speed of the video streaming did not compromise my learning	4.4±0.4	3-5
How likely are you to use the CREST resource again?	4.1±0.4	2-5
How likely are you to recommend the CREST resource to others?	4.2±0.3	3-5
How likely are you to use similar eLearning or streamed simulation resource again?	4.2±0.4	2-5

Table 3. Themes elicited from participants' reflections.

Themes	Subthemes
Attitude and perspectives	Affirmed their own attitude; change in perspectives
Remote access of learning resources	
Quality of teaching	Practical and useful aspects; interactivity; teaching method; increased confidence
More training needed	
Ways to improve the live video-streaming	Positioning of the cameras; improve image quality; physical set-up of videoconference

Attitude and perspectives

Through the sessions, some participants *affirmed their own attitude towards cultural diversity* such as not being judgemental, acknowledging differences, communicating openly and frankly.

Very important to be non-judgement and work on a compromise that makes patient feel comfortable, whilst obtaining the best health care options.

(Med student, male, south eastern European background)

Others described a *change in perspectives* akin to a *light bulb* moment when they realised that in fact they did not know as much about culturally sensitive communication as they originally thought.

Previously before the tutorial I didn't know what I didn't know about cultural barriers and the potential for miscommunication. The feedback from the tutor and patient has I believe increased my capacity and awareness.

(Med student, male, Caucasian background)

Remote access of learning resources

The ability to remotely access such learning resources was seen as important by many participants.

Be able to communicate with people about health care problems regardless of the geographical location.

(Med student, male, south eastern European background)

Quality of teaching

Several participants commented on the quality of the teaching and the way the sessions complemented and supplemented the learning that they are currently receiving from their courses.

Brings up good points that are not covered comprehensively in our course.

(Med student, female, background not disclosed)

The *practical and useful aspects* of the training including communication frameworks, tools and feedback from tutors and simulated patients helped participants to learn the importance of negotiation, compromise and including patients in decision-making.

I now have a good framework and additional experience to use in interactions with people from different cultures.

(Med student, male, Caucasian background)

The simulation and SPs in particular enhanced the *interactivity* which some participants declared to be more conducive than pre-recorded lectures and self-directed online learning or even Skype.

It was much better than just doing an online module. Nice to have interaction with tutor and simulated patient. It was so much better than Skype.

(Med student, female, Caucasian background)

Nevertheless, participants from one particular session specifically suggested a change to the *teaching method* to include a demonstration interview by the tutor with the simulated patient.

Having an example video or being shown the appropriate way to use the tools prior to interacting with the simulated patient would improve the experience.

(Med student, female, background not disclosed)

Some expressed an *increased confidence* following the session in negotiating cultural differences.

I feel more confident with the notion of compromise and to include the patient in decisions made about their management.

(Med student, female, Asian background)

More training needed

Importantly, some participants acknowledged that more training is needed to achieve proficiency and competency.

I think I will be better equipped with more exposure with patient of different cultural backgrounds. I think this will come with time.

(Med student, female, Asian background)

Ways to improve the live video-streaming

Ways to improve the *positioning of the camera* to better capture the simulate patients' facial expression, gait, size were suggested by many participants to improve the authenticity of the simulation exercise.

Camera positioned so that it looks like you are looking directly at the person on the other end.

(Med student, female, European background)

Even though there was high agreement that the quality of picture and the speed of the video streaming did not compromise their learning experience, there were still suggestions to improve the rate of data transfer and resolution to *improve image quality* and minimise lag.

(You could improve) picture quality and lag minimisation

(Med student, male, south eastern European background)

Participants also made suggestions about the *physical set-up of the videoconference*, such as lighting of the room, split screens, one-way viewing, to possibly improve their learning experience.

Possibly better lighting. Some of us were slightly in shadow. Practise at focussing camera.

(Med student, male, Caucasian background)

Discussion

This study examined the delivery and feasibility of innovative cultural sensitivity training to health professional students and trainees using live video streaming and simulation in rural and regional settings. The findings show that participants' self-reported cultural competence showed an improvement, particularly in cultural skills, even after one CREST session. The focus on communication frameworks and tools and the opportunity to practise with CALD SPs enabled participants to gain skills that they otherwise would not gain from traditional teaching and learning methods. The efficacy of cultural awareness training without a practical focus has long been questioned.^{21,22} A 15-month national research study of the effectiveness of cross-cultural training in the Australian public and community sectors indicated that although there is improvement in awareness, knowledge and understanding of *other cultures and organisational cultural diversity policies and issues*, such training did not result in skills that can be used across different cultures.²³ Cultural desire, on the other hand, requires longer term exposure and cultivation and cannot be hoped to improve after only one CREST session.

It is evident from both the quantitative and qualitative data that, despite the many technological challenges during the 6 sessions, par-

ticipants appreciated the quality of teaching and the learning experience provided by CREST and the simulation exercises with the SPs. Health care professionals are increasingly cognisant of their exposure to wider and more diverse patient population groups, and the need for education and training in cultural competence.²⁴ This study provides further evidence that simulation pedagogy is an effective mode of teaching cultural competence. Embedding cultural sensitivity training such as CREST and offering opportunities for students and practitioners to learn and develop communication skills with professionally trained CALD SPs within health professional curricula across universities and professional development training bodies have the potential to address issues of health inequalities arising from a lack of cultural competence from health professionals. The implications our findings have on curricular development will not be limited to health but has the potential to be extended to other non-health disciplines where communication is taught.

Although our data indicated that video-streaming was a feasible mode to deliver the CREST modules, logistical considerations were more complex for point-to-point video link-up deliveries for this mode to perform successfully. Prior to the sessions, intense planning, coordination and technical adjustments were necessary from preparing the simulated patients, navigating between different room booking systems to testing and retesting the videoconferencing equipment. Despite the considerable testing, technical difficulties still occurred on the day. During the sessions, different videoconferencing equipment at different sites made simple operations such as zooming and panning the camera and muting the sound at one end while giving the presentation and conducting the simulation challenging for the presenter.

Minor unexpected incidents such as random external calls on the videoconference unit during simulation, the phone in the room ringing during simulation and inadvertently not muting the presenter while the students were role-playing, easily affected the fidelity of the simulation. Furthermore, the facilitators' level of experience, level of comfort with technology and comfort to teach cultural diversity and sensitivity at the participants' end was observed to have a noticeable impact on the interactivity and participants' own comfort level at one particular session. This observation was confirmed on a later occasion when there was a last-minute room change which meant there was no prior testing of the videoconferencing set-up. Many technical challenges including images freezing when the presentation was loaded; poor sound and loss of images happened as a result. Despite this, the session went well due mainly to the effort of an enthusiastic facilitator suggesting that a competent and experienced facilitator may be more important than having the ideal technical set-up.

Conclusions

Cultural sensitivity education such as CREST using live video-streaming and simulation can contribute to health professionals' learning and is effective in improving cultural competency in a rural setting where the need is great and training does not always take place. Inadequate infrastructure and technical support can be a considerable barrier to creating a conducive virtual classroom environment for teaching and learning. Our findings reveal the need for an audit of the videoconferencing facilities in the city campus and the need for adequate IT support and planning for this teaching modality to be sustainable. A dedicated simulation room with high-resolution videoconferencing equipment and on-site technical support would improve the authenticity and fidelity of simulation and facilitate CREST's delivery to rural and remote learners. To ensure that the highly interactive features in the CREST modules are a powerful tool to connect with learners, reliable, affordable and accessible broadband Internet services are

essential. Importantly, this project established an interdisciplinary and cross-sector IBES-CREST team collaborating to address issues of health inequalities arising from a lack of cultural sensitivity training for health professionals. As a result, CREST is now embedded within the health professional curricula at two universities.

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