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GLOBAL SUMMER SCHOOLS: DEVELOPING MULTICULTURAL COMPETENCIES STAYING AT HOME

A. Hidalgo-Bastida[1], R. Cullen[1], C. McAllister-Gibson[1], M.G. Ramirez Sotelo[2], F. Boccafoschi[3], M. Giordano[4]

[1]Manchester Metropolitan University (UNITED KINGDOM)

[2]Unidad Profesional Interdisciplinaria de Biotecnologia UPIBI-IPN (MEXICO)

[3] Department of Health Sciences, Universita del Piemonte Orientale UPO-Novara (ITALY)

[4]Escuela Nacional de Estudios Superiores, Unidad Juriquilla, UNAM (MEXICO)

Abstract

International summer schools are a well know approach to improve technical skills as well as to develop multicultural competencies [1]. University students benefit particularly from these as they can also acquire specialist knowledge which might inspire them to pursue a specific research topic or to consider options abroad for further education or employment after graduation. The global disruption of COVID-19 prevented international schools during the summers of 2020 and 2021, and continues to restrict international travel, with some higher education institutions holding a stricter policy to protect students and staff, limiting travel until further notice. A virtual alternative global summer school was coordinated by an international team of universities to enable students in biomed/biotech/bioeng areas, to experience a virtual summer school, supporting their employability while fostering international academic collaborations between departments.

The aim was to deliver an online summer school that would provide an insight into the latest research projects, as much as, allow students to learn about other cultures. The programme was planned for 66% for scientific talks, and 33% cultural talks, the latter including virtual tours of cities, live food sessions, recorded videos of participants performing folkloric dances and introduction to languages. The programme ran over four days, each hosted by a different institution.

Prior institutional experience on blended teaching and virtual collaborations allowed the team to run the online school with appropriate technologies to coordinate questions and polls to monitor students' experience and assess their learning. The official language of the programme was English; speakers, chairs and coordinators connected via zoom, with sessions being watched by 200 long-term viewers in Facebook live and Youtube live. Sessions were interactive with quizzes and polls using Kahoot and Vevox, the latter, allowed real time data analysis to compare the perception of students about their multicultural and scientific experience. Finally, students were assessed on the scientific content with a final VLE MCQ, which also allowed one institution (UPO) to award credits for a module, and another institution (MMU) to provide extracurricular points for their RISE Award.

Student engagement was constant, and feedback showed high satisfaction levels for attending a summer school that not only exposed them to high-quality international research, but also to other cultures; with data showing 66% of students enjoyed cultural sessions as much as scientific talks (n=35±10). In addition, 95% of students confirmed that they were more likely to travel to one of the hosting countries, and 93% more likely to learn one of the hosting languages after the global summer school, indicating a strong correlation between a virtual international activity, and an inclusive attitude and new-found multicultural proficiency. Despite the success, our current structure should evolve to include virtual spaces to facilitate group work and students' interactions [2] to assist intercultural learning and complement the high-quality scientific engagement and the rich cultural exchange.

Keywords: internationalisation at home, multicultural competencies, global collaborations, inclusive learning, apps for education

1   INTRODUCTION

Information and technical innovations are progressing rapidly due to the development and wide use of mass media, enabling reaching a colossal number of individuals regardless of their background. This century's technologies and developments promise to speed up communications at a faster pace [3]. In this context, international summer schools may play a key role in developing learning platforms and strengthening collaborations between Universities in terms of internationalization. In fact, one of the European government educational strategies is to significantly improve the internationalization at all educational levels, as a response to the competitive pressure of globalization [4]. Developing a critical approach and exposing young researchers to knowledge exchange contribute to form them as rigorous scientists. Thus, international summer schools have several advantages in higher education: i) focusing on specific expertise area; ii) building a network with experts in the scientific area of interest; iii) supporting new experiences not only on research but also sharing a multicultural environment.

Unfortunately, the last two years have been disrupted by the COVID-19 pandemic, and education at all levels has been significantly affected. Once again, communication technologies represented an extraordinary resource to avoid total interruption in the educational field. Above all, Universities quickly adapted teaching methods in remote/blended mode, and only in some cases, for instance when practical experiences were required, have been negatively affected causing a delay in learning [5]. Amidst all the disruption, COVID-19 pandemic has provided opportunities to pave the way for introducing digital learning and facilitating remote collaborations. Following this trend, international summer schools followed the move to virtual, fostering new networks and nurturing existent ones, by spreading out and adding value to the remote teaching methods [6].

Scientific collaboration is believed to improve labour efficiency and research quality resulting in increased scientific production, knowledge creation and scientific breakthroughs [7]. According to Luukkonen and colleagues, the reasons underlying scientific collaboration are many, from geographical location and vicinity, to shared language and social and economic issues [8], with one of the elements that appear to be key for successful collaboration is having worked together before [9]. Working together seems to result in interactions that are qualitatively different, and cannot be mimicked by digital means, that is why conferences and courses are particularly important, because scientists have the chance of meeting with potential collaborators. This is particularly important for students in training and young scientists, for them high level courses have been shown to be especially productive [9].

There is widespread interest in the study of the factors that underlie the establishment of successful scientific collaborations, which is not a trivial matter. This research starts with operational definitions, such as what is considered a successful collaboration, and then with the choice of valid and reliable metrics. Based on cognitive, social, historical, geopolitical, and economic factors, it is possible to provide a variety of metrics to evaluate the influence of these factors on scientific collaborations. In particular, social factors, such as history, language, seem to be important influences on the collaborative networks at the macro level, while intellectual dependence seems relevant at the level of single countries [8]. Recent studies continue to work on the issue of which is the best indicator of scientific collaborations, and conclude that few indicators meet all possible requirements, so that frequently indicators known as PAC (probably approximately correct) are used [10]. Other studies have mapped the efficiency of international scientific collaborations between cities, finding that currently US–Europe co-publication links are more efficient in terms of producing highly cited papers than those international links that Asian cities have built in scientific collaboration [11]. In terms of the relation between student mobility and scientific collaboration, Hou and colleagues found a high degree of spatial matching between those factors [12]. The factors that influence scientific collaborations are many, and not perfectly understood, what is clear is that working together is relevant, and that student mobility and access to in person courses and conferences, has positive effects on international collaborations. Nevertheless, given the mobility restrictions, distance education and virtual collaborations have offered students and staff an invaluable opportunity to undertake specialised training and research.

Distance education has historically been presented in four stages or generations: correspondence, telecommunication, telematics, and training via the Internet of Learning [13-14]. The first stage began in the late 19th and early 20th centuries, where, through the introduction of the postal service in the

United Kingdom, the University of Lund, in 1833 and then in 1843, Isaac Pitman sent correspondence courses or knowledge at the national level. In the case of telecommunications, we have the example of the University of Iowa, which in 1939 implemented education through telephone contact with a disability or illness. In 1952, the Chicago Educational TV Association Foundation taught educational content on television; in 1969, British Open University created Higher Distance Education and in 1971, the United States created Empire State College, a centre under the University of New York [15]. Around the 90s, different institutions were created with the distance education modality, highlighting: The National University of Distance Education of Spain in 1972. In 1974 the Fern Universität University of Hagen was created in Germany; the Open Universiteit in 1982 in the Netherlands; the National Distance Education Centre in 1982 in Ireland, in 1984 the Association for Distance Education in Sweden, among others [14]. With the development of the Internet and its accessibility in various spaces in the world, distance education took on a boom, transforming education as a new educational model, with UNESCO for the first time defining it as 21st century distance higher education [13]. The first-ever Global Report on Adult Learning and Education is based on 154 National Reports submitted by UNESCO Member States on the state of adult learning and education, five Regional Synthesis Reports and secondary literature. Online and blended learning have become common place in 21st century higher education. Larreamendy-Joerns and Leinhardt's review of the literature "observed two complementary movements in the educational landscape: the merging of online teaching and learning into the stream of everyday practices at universities, and the increasingly salient role of distance programs in institutions of higher education" [16]. Merrill Lynch & Co. analysis states that by 2025 there will be 160 million people pursuing higher education studies, of which 40 million will be linked to online education at some point in their lives, which is one in four students, showing the impact that virtual education process will have [17].

Educational reforms in Mexico include distance education through the white paper "The Vision of Higher Education to 2025", which highlights an increase in the responsiveness of higher education institutions to meet the academic needs of their students measured by academic exchange networks [18]. Their national strategy includes Information and Communication Technologies (ICT) in the learning teaching process through three lines of action: to develop a national policy on educational informatics, focused on developing students' skills to learn by using ICT; to expand the provision of computer equipment and ensuring connectivity in educational establishments; and to intensify the use of technological innovation tools at all levels of the education system. The increase in virtual education even before the COVID-19 pandemic was evident with 65% of the offer of courses worldwide being virtual since 2007 [19]); while in Latin America institutions, such as the High Technology Centre at a Distance (UNAM) and the e-Mexico project, were created to lead the efforts on the use and exploitation of the technological scheme

The provision of distance education in Mexican state institutions is based on the normative guidelines and their educational models, as an example, the National Polytechnic Institute (IPN) has implemented distance learning though their Quality Management System, which states the strategic processes, mediated by senior management and quality management, for training which will have as input the following elements: organisation's context, and students and users' needs and expectations. These are derived from the objective and mission of the institution and are to be defined in seven: academic and educational innovation, validation of training actions and teacher trajectories, dissemination of the educational offer of the learning units, management and validation of the student's school trajectory, the teaching-learning process and finally, the integration of competences for the degree (Fig 1) [20]. A welcome benefit of the quality management system for educational activities in a hybrid and online mode is the increased opportunities for interaction between departments and institutions, at national and international level, such is the case of the development of this global summer that extended its borders to three countries and to students and public interested in the topics of biotechnology and biomedical sciences.

Progress towards the adoption of online and/or blended education was clearly accelerated by the COVID-19 confinement plan in March 2020, which forced HEI to carry out their academic mission through the use of different media and digital platforms, to minimise the impact of such disruption while prioritising society's health and safety.
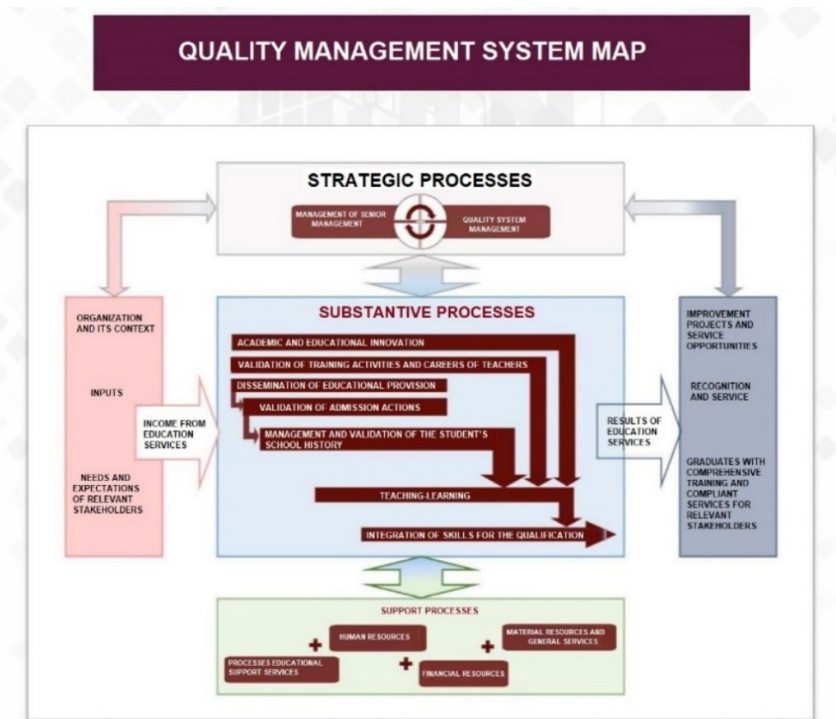
Fig 1. Quality Management system to enable distance learning

A central aim of Manchester Metropolitan University's shift online in response to the COVID19 pandemic was to ensure that "live" online teaching sessions provided engaging active learning experiences for students. MS Teams had been rapidly rolled out across the university to deliver live online teaching sessions in time for the start of teaching in September 2020 but teaching staff reported that it lacked tools for delivering engaging activities e.g. Quizzes and Polls. Some teaching staff were using freely available Apps for quizzing and polling and collaborative activities, but this was very challenging for less technologically experienced colleagues. Consequently, the university set up a trail project, starting in Jan 2021, to license 5 interactive Apps for Teaching and Learning to provide a toolkit for teaching colleagues to deliver active learning in the live online teaching sessions. The toolkit included 3 Quizzing and Polling Tools (Vevox, Kahoot and Mentimeter), a groupwork collaboration Whiteboard (Padlet) and Multiple activity tool (Nearpod) [21].

Among the educational apps available, Vevox was deemed the most appropriate to use in this global summer school to capture feedback in live sessions, primarily because of its simplicity of use for both teachers and students, and because of the real time analysis slide feature, in addition to being a Manchester Met licensed tool, with no limitations to its use in respect of available questions types (MCQs and Open Free Text question types were required) and number of participants in the sessions, as opposed to free quizzing and polling tools. The real time analysis tool was identified as key to evaluate, and share on real time, participants' feedback on the scientific and cultural aspects of this global summer school [22].

Internationalisation of Higher Education is a complex policy that goes beyond international recruitment, focusing equally on Transnational Education (TNE), Internationalisation of the curriculum and Mobility to ensure graduates are active players in the global market leading multicultural teams [23-24]. Mobility, whether it is short-term (summer school, visit, placement) or long-term (studying abroad), allows individuals to develop multicultural competences based on behavioural, cognitive, and affective skills [25], and building on soft skills that, ultimately, boost employability. The challenge this consortium faced then was to deliver the cultural component of an international school within an engaging virtual programme. Virtual summer schools tackle some of the barriers for attending these traditionally abroad: financial considerations, cultural reticence, caring responsibilities, and safety,

however, given the expansion of (free) thematic webinars, online traditional summer schools, do not offer any clear advantage over these webinars.

2 METHODOLOGY

The methodology for the planning and implementation of this global summer school considered the key factors on summer schools and virtual events as follows:

Team

A consortium developed through biotechnology/biomedical research networks included five international universities: Unidad Profesional Interdisciplinaria de Biotecnologia (UPIBI-IPN, Mexico), Escuela Nacional de Estudios Superiores, Unidad Juriquilla, UNAM (ENES-Juriquilla, Mexico), Universita del Piemonte Orientale-Novara (UPO-Novara, Italy) and Manchester Metropolitan University (Manchester Met, UK). Each institutional lead coordinated local activities such as recruitment and programme.

Communication

The team communicated via email mainly because of time difference, which was regular with updates every 2 weeks. During the event the team communicated via a WhatsApp chat with institutional leads and chairs. The use of the chat was limited for urgent/instant communications during daily sessions, and to share questions posted in the social media platforms. It was agreed that the official language for communications and for the summer school would be English.

Programme design

In order to ensure equal exposure to all institutions and cultures, the summer school was planned for the same number of sessions as partners, four. Each institution led a session including scientific talks by research active staff, as well as cultural sessions, to expose participants to the differences they would have experienced if they have travelled to the hosting country for a summer school. The programme was planned for 66% for scientific talks, and 33% cultural talks, the latter including virtual tours of cities, live food sessions, recorded videos of participants performing folkloric dances and introduction to languages. Sessions were planned for half a day only, give the time difference between the participants, seven hours between Mexico and Italy (Figure 2).

Recruitment

Participating institutions recruited students using their university mailing list available from undergraduate and postgraduate courses. Courses included BSc, BEng, MSc, MRes and PhD in Biotechnology, Biomedical Sciences, Genomics, Neurosciences, Bioengineering, Human Physiology, Tissue Eng, Medical Biotech and Medicine. There was no student data transferred among partners and each institution managed their recruitment and registration, if needed. The only restriction to participate was good command of the English language, which was not a limitation for students as all non-UK institutions offer English language courses.

Virtual Venue

Institutional leads, speakers and chairs used zoom to run the scientific and cultural sessions, which were broadcast for participants using Facebook Live and Youtube Live, hosted and advertised by ENES-Juriquilla, to avoid constrains on number of participants (Fig 3).

Feedback tools

Among the educational apps Manchester Met piloted, Vevox was selected as it allows teachers to add their questions to slides in their PPT presentations, and participants join the Vevox quiz session via a link and access pin using their preferred web enable device (Laptop, Macbook, Tablet device, Smartphone). A specific poll or question is opened by the speaker when they present the question slide, and participants answer through a web page interface or Vevox App (if they have chosen to install it on their device).

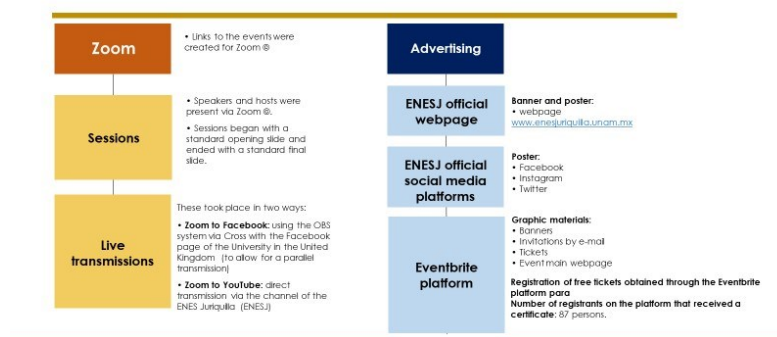Fig 2. Global summer school programme.

Fig 3. Diagram of how events were advertised (blue) and transmitted (orange and yellow) during the Global Summer School.

When the speaker closes the poll (by advancing the slide), the participant responses are processed, and results are added automatically to their PPT slide (Fig. 4). This versatility (in terms of devices) and simplicity made Vevox an ideal choice for use with the summer school students who were in different countries and who's digital skills set was unknow at the start. Feedback questions included demographic data on students' institution, course and gender, and summer school specific on the cultural and scientific sessions and likelihood to learn another language and travel to the hosting country.
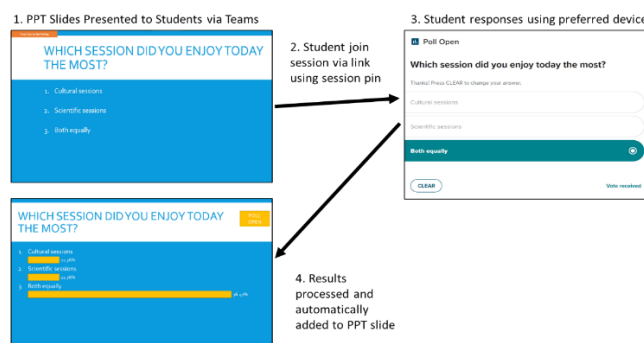

Fig 4. Vevox as a tool for real time analysis of feedback while presenting synchronously online.

3   RESULTS

The programme delivered in this global summer school covered state of the art research in the area of biotechnology, bioengineering and biomedical sciences, as well as cultural content (food, music, language, city landmarks) on Mexico, Italy and the United Kingdom. This successful summer school boasted stable student engagement ranging between 238 and 723 viewers over the four days, as showed in Fig 5. Furthermore, as sessions were recorded and uploaded to be available in social media platforms, the number of individuals who have accessed the sessions (up to December 2021) have increased, doubling the number of viewers in most of the sessions.
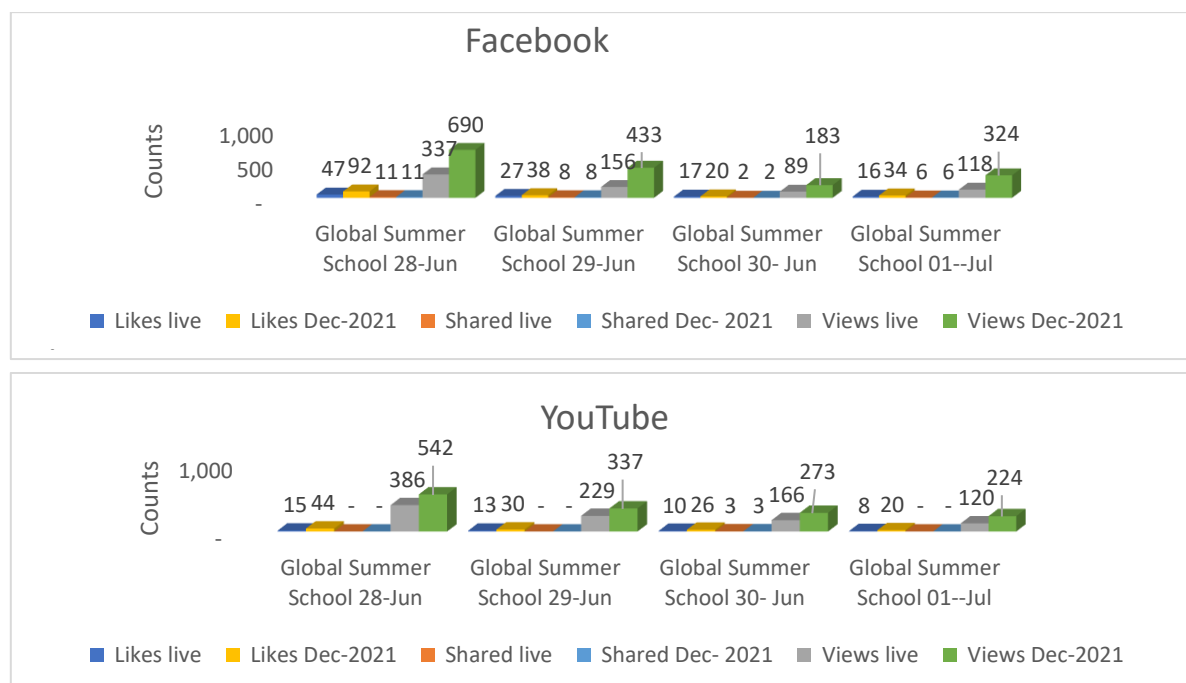

Figure 5.- Graphs showing the number of times that the videos on two social media sites (A. Facebook, B. YouTube) were viewed, liked, and shared, per day/host: 28/Jun-Manchester Metropolitan University, 29/Jun-ENES Juriquilla, 30/Jun-UPO Novara and 01/Jul-IPN UPIBI.

Feedback showed high levels of satisfaction for attending a summer school that not only exposed participants to high-quality international research, but also to other cultures; with data showing 66% of respondents enjoyed cultural sessions as much as scientific talks (n=35±10). In addition, 95% of respondents confirmed that they were more likely to travel to one of the hosting countries, and 93% more likely to learn one of the hosting languages after the global summer school, indicating a strong correlation between a virtual international activity, and an inclusive attitude and new-found multicultural proficiency (Fig 6).

Fig 6. Analysis results showing A) Proportion of students Institutions represented by session, B) Distribution of preference comparing cultural and scientific sessions , C) change on likelihood to travel to the hosting country, and D) change on likelihood to learn the language of the hosting country by sessions: Day 1 Manchester Met (yellow), Day 2 ENES-Juriquilla (light green), Day 3 UPO-Novara (green) and Day 4 IPN-UPIBI (pink).

4   CONCLUSIONS

International travel to either complete a course/training, foster a collaboration or present work, not only accomplishes the professional goal, but also, importantly, enables the individual to immerse themselves in the new culture, developing a different sense of place to the individual's environment and allowing them to connect to the geographical place, new colleagues, and/or culture, including language. Understanding the different cultures represented in a team, while working together in international projects, is already recognised as the key to the success of such endeavour, as exemplified by with the British Council Researcher Links workshops, which guidelines require to include in the proposed programme, a cultural activity for visiting researchers.

Distance learning and online courses present advantages such as low cost and accessibility, and they are effective for knowledge exchange, however, multicultural competencies obtained through international travel and work are difficult to acquire in an online environment. Ensuring virtual international summer schools and workshops have a structured section for cultural exchange and learning, attempting to replicate the *in vivo* experience, will reduce the impact of not traveling abroad for such activities and provide basic multicultural competencies such as empathy for other cultures (cultural sensitivity) and intercultural communication. This work shows the benefit of including such enriching sessions to expose participant to three different cultures (Mexico, Italy, and the United

Kingdom), and how this was not only welcomed by the summer school students, but also how this opened their minds to consider traveling and/or learning a new language.

This first global summer school provided a starting point for this consortium to establish a free inclusive summer school that will allow all students, especially those who cannot travel abroad because of caring responsibilities, financial, or health reasons, to expand their scientific knowledge while having an opportunity to interact with international students and learn about other cultures. In addition to cultural sessions, subsequent summer schools will also include a session on the characteristics and differences of Higher Education systems, similar to Manchester Metropolitan University's induction for international students, to provide contextual understanding of universities abroad.

Furthermore, to ensure spaces for meaningful virtual interactions, future summer schools will include the option of moderated break out rooms to provide opportunities for student-student interaction and to facilitate group work, to develop further multicultural skills such as adapting to enable effective work in a multicultural team and considering diversity as an opportunity rather than a challenge.

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