Article

Education for a Sustainable Future: Strategies for Holistic Global Competence Development at Engineering Institutions

Björn Kjellgren * and Tanja Richter

Department of Learning in Engineering Sciences, KTH Royal Institute of Technology, 114 28 Stockholm, Sweden; tanjar@kth.se
* Correspondence: bjoern@kth.se

Abstract: Higher education institutions (HEIs) must ensure that their graduates possess not only professional know-how, but also the global competence to address the challenges posed in the UN’s 2030 Agenda. This is especially relevant in engineering education, which plays an important role in sustainable development. These competencies are typically thought to be developed in relation to institutions’ internationalisation efforts, but reports on how this is supposed to happen are often vague or built on wishful thinking. In this article, we describe a mixed-methods investigation into how holistic global competence development as a crucial aspect of sustainable education can be systematically enhanced in higher engineering education. Following a design-based research approach, connecting theoretical and practical insights from experts and stakeholders, we present here four dimensions of such an approach. Firstly, we discuss the setup, contents, and implementation of institutional guidelines as the crucial starting point of any internationalisation strategy aiming at integrating sustainable development education and global competence development. Secondly, we stress the role of institutional diversity, and show how institutions can foster inclusive and welcoming environments. Thirdly, we suggest strategies and approaches for global competence training for students, faculty, and staff, and highlight important background considerations for enabling global competence development. Fourthly, we emphasise the importance of assessing efforts to ensure that they live up to their potential and deliver the desired outcomes. The recommendations based on the investigation summarise key considerations that all HEIs—not just those focused on engineering education—must take into account as they strive for holistic global competence development, which is a key aspect of education for sustainable development.

Keywords: global competence; engineering education; SDG 4; education for sustainable development; internationalisation

1. Introduction and Aim of the Study

With globalisation changing professional demands and creating both opportunities and challenges for a sustainable future, higher engineering education must react without delay. The UN’s 2030 Agenda for Sustainable Development recognises this, as illustrated by goal 4: quality education [1], which in a way can be seen as underpinning the efforts of most of the other sustainable development goals (SDGs). One can hardly overstress the crucial role of inclusive and equitable quality education in enabling the drive towards sustainable development and the successful achievement of the other SDGs. Encompassing not only the need for inclusive and effective lifelong learning environments for all, regardless of gender, social, cultural, and personal background, but also aiming for a shared sense of global citizenship and a positive appreciation of cultural diversity, this is a goal with truly revolutionising ramifications. With the current global challenges encapsulated in the SDGs being immensely complex and connected to various spheres, they require holistic, innovative problem-solving approaches from a culturally and disciplinarily diverse array of actors [2,3]. Inclusive and equitable education, mindful of creating the change agents...
needed to possess such an open and global mindset, will be a crucial step for creating a sustainable future.

Fostering such a mindset is needed especially within engineering education, which plays not only a vital role for enabling sustainable development [4,5], but also holds a special position in the educational landscape. Engineering teachers, self-identifying as “problem-solvers,” have been among the more proactive in education for sustainable development, seeing that many of the practical problems of the SDGs can be addressed through the means of engineering. The drive to come up with innovative, more sustainable solutions to old and new problems is in itself also a great motivator for students, attracting a new generation of youths who wish to contribute to the realisation of a sustainable and good future for all. In this drive, there is, most likely, also a tacit recognition of the undeniable fact that many of the current global challenges may, in part, have been brought about by the engineers of previous generations.

Our aim with the present mixed-methods study is to connect insights from the literature with the experiences and ideas of students, faculty, and staff at technical universities to ground a proposal that holistic global competence development is a key facet of education for sustainable development at engineering institutions. On the following pages, we will first delineate the background to our considerations: the challenges of truly sustainable engineering education, the role global competence education could play in engineering education, and higher education’s approaches for, and failures in, fostering such competence development. Based on our findings, we will then propose ways to systematically help foster such competences in students, faculty, and staff. We will stress the need to overcome the gaps between different stakeholders’ understandings of the overall goals, as well as the gap between strategy claims and actual implementation of global competence development mentioned in literature [6,7].

1.1. The Challenges of Sustainable Engineering Education

Notwithstanding the enthusiasm of its many “problem solvers,” the field of engineering education also encounters special challenges in fulfilling its potential for the UN’s 2030 Agenda. In the endeavour to remodel engineering education into a solver of sustainability problems, the focus has overwhelmingly been on the economic and environmental dimensions of sustainability [8]. These areas were often already parts of the curricula, and thus sometimes needed no more than some tweaking and more space to include a sustainability dimension. The social aspects, although not totally forgotten, are still too often seen as less of an engineering concern, and as not only far removed from the technical core of engineering education, but also from the expertise of the teachers. An additional issue is that the long-standing focus on “hard” technical expertise leaves little room for “softer” aspects of the profession, especially in regard to the intercultural and interdisciplinary communication skills so vital to solve the wicked problems of the SDGs [2,9]. This is true for competencies widely recognised by educational standards in engineering, such as those of the CDIO [10] and ABET [11], as absolutely vital for engineers (e.g., teamwork and communicative skills), and it is even true when it comes to competencies seldom included in official standards, (e.g., a deeper understanding of the sociocultural aspects of engineering, the capacity to work appropriately and effectively in culturally heterogeneous environments, or cultural self-awareness).

Scholarship on the issue has long emphasised the value and need for expanding curricula beyond a primarily technical focus to integrate such competencies. Shephard [12] (p. 95) described affective outcomes—attitudes, values, and behaviours—as a central aspect of education for sustainability. White and Hastings [13] call for integrating communication skills within engineering curricula to produce global leaders who can skilfully interact with diverse collaboration partners or audiences. In addition, Rouvrais and Gaultier-Le Bris [14] highlight the overall need of engineering education to adapt to constantly changing requirements and societal challenges. Without claiming that there has already been a universal and finished mindset shift within the field of engineering education, a new
level of recognition of the situation now appears to exist among university management, teachers, and students. Competence approaches to education, characterised by transferability and action-orientation [13,15], appear promising in preparing students to be able to skillfully adapt to such changing contexts. Together with the insight that globalisation and its flows, not only of ideas and goods, but also of people, in and by itself will not bring about the realisation of all needed SDG outcomes for engineering education, this new awareness has kindled interest in a relatively new concept: global competence.

1.2. Global Competence for a Sustainable Future

The idea of global competence has found its way into academia, increasingly appearing in universities' vision plans and mission statements. Connecting important knowledge, skills, and attitudes relating to intercultural communication and collaboration to a sustainability mindset, it promises to be an invaluable addition to the engineering education of the 21st century. A recent report by the Asia Society and the OECD [16] even described global competence as “necessary for achieving the United Nations’ Sustainable Development goals” (p. 11). Nevertheless, its exact meaning appears elusive, with many different, sometimes overlapping, sometimes divergent, conceptualisations. Among the most widely used definitions is the one put forward by the OECD, which states that: “Global competence is the capacity to examine local, global and intercultural issues, to understand and appreciate the perspectives and world views of others, to engage in open, appropriate and effective interactions with people from different cultures, and to act for collective well-being and sustainable development” [17] (p. 7). This definition already alludes to a dual focus on both intercultural as well as sustainability aspects, mirroring the contemporary need to comprehensively address the complex challenges societies are faced with. In this way, the definition in a way also combines prevalent, yet unfortunately still distinctive approaches, such as the social sciences concept of intercultural competence [18,19], and the natural sciences concept of the key competencies for sustainability [20,21].

Conceptualisations related specifically to engineering, such as those by Downey and colleagues [22] or Grandin and Hedderich [23] build on the notion of engineers as problem solvers, and focus specifically on the capabilities of working with others who “define problems differently.” Nevertheless, these and similar conceptualisations can be seen as rather vague, and could be interpreted in various ways, making it hard to pinpoint what exactly is that makes a person globally competent. This leads to a crucial issue at HEIs: if we do not know what global competence really is, then how can we foster it? Our own engagement with the issue of the hitherto rather vague concept of global competence has led to the creation of a more developed model of global competence and its constituent competencies—specific knowledge, skills, and attitudes—that we see as essential for developing global competence (see Figure 1).

According to our conceptualisation of global competence, illustrated in Figure 1, global competence is rooted in both: (1) a personal sphere—the individual’s own knowledge, skills, and attitudes; and (2) an interaction sphere—the individual’s behaviour in communication, collaboration, and relation-building. The arrows illustrate the interactivity between the spheres: one’s personal knowledge, skills, and attitudes will have important effects on one’s behaviour in interactional situations, and, at the same time, experiences in the interaction sphere will affect one’s knowledge, skills, and attitudes. We posit that global competence is a continuum with no endpoint, rather than a have or have not quality. While this conceptualisation is still evolving and open for further developments, we use it here as a starting point for our work with global competence.
Recognising the potential of global competence, many HEIs focus on their internationalisation strategies, especially international mobility, as the primary catalyst for its development [24,25]. Internationalisation is indeed often seen as the integration of intercultural and global dimensions within education. While originally concerned with the integration of these into the purpose, functions, and delivery of higher education [26], the scholarly discourse has recently shifted towards a broader focus on the learner and their learning environments [27], and a sustainable mindset in terms of the quality of education and potential contributions to society [28]. However, as it were, there is yet scant evidence of internationalisation efforts living up to the vision of creating globally competent students, and sustainable internationalisation is a quite new, and perhaps to HEIs somewhat frightening concept. This may have devastating impacts on not only students’ education, but also our striving for a sustainable future.

A second common approach to integrating important attitudes, values, and skills relevant to global competence is the incorporation of related learning outcomes in either specific courses or within specific modules or course activities. While this certainly constitutes an important starting point, there are numerous challenges to this approach. One such challenge is that learning outcomes must be aligned with one another throughout a student’s whole programme curriculum, which is not only an immense logistic endeavour [14], but also suffers setbacks when students switch programmes or take individual courses in different chronologies. Additionally, if learning is to occur, the relevance for the student’s professional life must also be made explicit. This is especially the case for content relating to the social dimensions of sustainability, as highlighted in global competence, which might encounter resistance in the traditionally hard sciences. Works by Cruickshank and Fenner [9] or Halbe and colleagues [2] have stressed the need for going beyond technical solutions focused on the environment or economy, and also highlight social aspects of sustainability education for engineers. This also directly relates to the importance of engineering teachers, who are typically technical subject specialists rather than experts in global learning or sustainability education.

Figure 1. The competencies leading to global competence.

1.3. Higher Education’s Present Approaches to Global Competence Development

According to our conceptualisation of global competence, illustrated in Figure 1, the competencies leading to global competence...
If higher education is to succeed in contributing to the 2030 Agenda, it has to revert from compartmentalised approaches to integrating sustainability aspects and international or global learning, which are, at present, kept separate from one another within the curricula. Indeed, we contend that a truly sustainable way forward for the education of the 21st century depends upon a holistic approach to incorporating the global competence needed for a sustainable and diverse future. In the context of engineering, it is clear that supporting students in the development of such complex competencies is not an easy task. This makes it even more apparent that simple fixes, such as specific courses or course elements focusing on one aspect and not the other, will not be enough for students to become globally competent. Instead, careful consideration and strategic implementation are needed to not only match the needs of various stakeholders, but also to maximise the potential impacts of activities hoped to foster global competence as a part of education for sustainable development.

2. Materials and Methods

We view holistic global competence development as key area in education for sustainable development, but its successful integration requires a comprehensive and strategic approach to ensure invaluable qualitative outcomes. Considering the importance of global competence development for engineering students, other stakeholders, and society—and the lack of practical guidance for HEIs and educators wanting to foster global competence—we set out to develop an overview of the main dimensions to consider. With the high stakes involved in fostering education for sustainable development, ensuring the practical value and applicability of our insights are of the utmost importance. Therefore, we decided upon a qualitative design-based research methodology, which has been described as “a methodology designed by and for educators that seeks to increase the impact, transfer, and translation of education research into improved practice” [29] (p. 16).

Design-based research is characterised by the synthesis of educational theory and practice, and employs an iterative process of designing, implementing, analysing, and refining both theory and practice [30,31]. In this regard, we collected and synthesised insights on internationalisation efforts for global competence development in the context of an ongoing Erasmus+ project and transformed them into four dimensions of holistic global competence development. As part of our research process, we connected several sources of data with our own work and experience in global competence development. Using a mixed-methods approach, we connected the following main sources of data: insights from an in-depth literature study, interviews with experts working with internationalisation, and surveys focusing on different stakeholder perspectives.

2.1. Insights from an In-Depth Literature Study

The first basis for our initial working outline consisted of theoretical insights from an in-depth literature study on higher education approaches for global competence development strategies. Here we were focusing on the opportunities individual strategies presented, and the challenges relating to general observations as well as specific implementations. This included theoretical contemplations by scholars working with internationalisation or global competence development, as well as pedagogical insights into learning theory. In addition to this theoretical basis, we also paid attention to practical experiences and the reflections of practitioners, which were typically illustrated in scientific journals or conference reports.

2.2. Interviews with Experts Working with Internationalisation

Additionally, we collected practical insights from interviews with experts working in managerial positions related to internationalisation strategies and global competence development at higher education institutions. The partners working in our Erasmus+ project approached such internationalisation experts, typically working in university management or the internationalisation office, at their own and partner institutions for interviews about
their insights and perspectives on the issue. Eight of these internationalisation experts responded positively to the request and were consequently interviewed in video calls in winter 2020/2021. The interviews focused primarily on internationalisation strategies as catalysts for global competence development. The interviews followed a semi-structured interview guide with open-ended questions on the issue (see Supplementary Materials). These practitioners were later also invited to review and comment on the first results of our guidelines.

2.3. Surveys Focusing on Different Stakeholder Perspectives

We further collected practical insights from surveys carried out between October and November 2020 among faculty, staff, and students from several countries as major stakeholders in HEI educational strategies. We offered different online surveys for (1) the faculty and staff category, and (2) the student category, with internationalisation and global competence development as major focus areas. They included closed and open-ended questions regarding previous experiences, opportunities, and challenges encountered in international mobility, classroom learning, and ways of global competence development (see Supplementary Materials). Tables 1 and 2 summarise characteristics of the respondents.

Table 1. Characteristics of the student survey respondents (N = 642).

| Demographic Characteristics | Number of Respondents | Percentage |
|-----------------------------|-----------------------|------------|
| **Location**                |                       |            |
| France                      | 194                   | 30.2%      |
| Italy                       | 141                   | 22.0%      |
| Spain                       | 137                   | 21.3%      |
| Sweden                      | 102                   | 15.9%      |
| Germany                     | 7                     | 1.1%       |
| Portugal                    | 5                     | 0.8%       |
| Switzerland                 | 5                     | 0.8%       |
| Australia                   | 4                     | 0.6%       |
| Hong Kong                   | 3                     | 0.5%       |
| Japan                       | 3                     | 0.5%       |
| The Netherlands             | 3                     | 0.5%       |
| Hungary                     | 2                     | 0.3%       |
| Belgium                     | 2                     | 0.3%       |
| Tunisia                     | 2                     | 0.3%       |
| Brazil                      | 2                     | 0.3%       |
| Singapore                   | 1                     | 0.2%       |
| Iran                        | 1                     | 0.2%       |
| Morocco                     | 1                     | 0.2%       |
| Taiwan                      | 1                     | 0.2%       |
| Russia                      | 1                     | 0.2%       |
| Columbia                    | 1                     | 0.2%       |
| Poland                      | 1                     | 0.2%       |
| Ireland                     | 1                     | 0.2%       |
| Scotland                    | 1                     | 0.2%       |
| India                       | 1                     | 0.2%       |
| South Africa                | 1                     | 0.2%       |
| Greece                      | 1                     | 0.2%       |
| Nigeria                     | 1                     | 0.2%       |
| Argentina                   | 1                     | 0.2%       |
| Turkey                      | 1                     | 0.2%       |
| Latvia                      | 1                     | 0.2%       |
| Austria                     | 1                     | 0.2%       |
| UK                          | 1                     | 0.2%       |
| N/A                         | 12                    | 1.9%       |
| **Gender**                  |                       |            |
| Male                        | 386                   | 60.1%      |
| Female                      | 249                   | 38.8%      |
| Other/Prefer not to say     | 7                     | 1.1%       |
The online surveys were distributed through the internationalisation offices of the participating Erasmus+ partners, which accounts for the large number of respondents from France, Italy, Spain, and Sweden, but it should be stressed that we were looking for qualitative input in the form of diverse experience, not statistically representative data from which to generalise to a global population of university students, faculty, and staff.

In accordance with the principles of design-based research, we first created an initial outline for strategies from the literature study, which was then adapted and revised iteratively with the inclusion of new insights from the other sources of data. The insights from the literature study were initially used to establish a rough outline of main dimensions, namely institutional management, faculty and staff, and students. Accordingly, we afterwards approached different stakeholders from each of these groups to obtain their perspectives on different issues through the interviews and surveys described earlier. Afterwards, the initial outline was revised taking practical insights into account. After accumulating the different insights from all sources of data, preliminary guidelines including all dimensions were devised by the two main researchers. In the sense of design-based research, literature was consulted again regarding new points raised by the individual stakeholders when the draft was created. To ensure high relevance and practical value for higher education institutions, including the relevant stakeholders, the guidelines were consequently further reviewed and validated with a variety of stakeholders, including the project partners from the Erasmus+ and another internationalisation project, interna-
tionalisation experts, student representatives, as well as a university discussion panel on internationalisation. This final step helped to confirm the relevance of the guidelines for stakeholders, and was used to enhance and/or clarify individual aspects of the guidelines (see Figure 2 for details). Subsequently, we designed a user-friendly guidebook for staff and HEI management, the main strategic points of which will be presented in the following pages.

![Figure 2. The project workflow.](image-url)

### 3. Results and Discussion

After collecting and synthesising insights on approaches for global competence development, including background considerations, advantages, and challenges, we developed holistic and practical guidelines for higher education. Overall, our exploration confirmed that a comprehensive approach is essential for HEIs wanting to develop global competence. This insight comes with three overarching lessons: First, everyone—institutional management, faculty and staff, as well as students—needs to be considered and included in global competence development. Comprehensive global competence development can only be achieved if all stakeholders are considered and involved. Second, approaches to global competence development need to be strategic and planned. Quick fixes or add-ons seldom lead to sustainable results, and while individual activities (e.g., a workshop or course) might be a good start, a thorough integration within university curricula and everyday practice is needed. Third, there are ample opportunities for various forms of global competence learning. Home campuses and culturally diverse student bodies have immense potential for sustainable global learning, but any activity needs to be well thought through in order to provide an opportunity for meaningful and manageable learning. These findings confirm similar conclusions drawn by others (see, e.g., [27,32–35]), but our study takes the next step of turning the insights into a comprehensive set of readily applicable dimensions and guidelines.

Looking more closely into how these lessons could be transferred into practice and support holistic global competence development as basis for education for sustainable development, we identified four interrelated key dimensions that must be considered in HEI efforts: (1) institutional clarity about goals and concepts, (2) institutional diversity, (3) global competence training for everyone, and (4) assessment to monitor progress. These four dimensions, illustrated in Figure 3 below, are intricately connected and build on each other. However, for the benefit of clarity, we will describe them separately.

#### 3.1. Institutional Clarity about Goals and Concepts

For higher education institutions wanting to prepare their students for the globalised world, there are many different ways to move forward. Educational scholarship and practice have been flooded with different approaches and concepts that are needed to achieve just this. Concepts such as education for sustainable development, internationalisation, and global competence appear to have clear objectives. However, what exactly these—and many similar ideas—really mean in practice might be interpreted very differently. If one
is to avoid the mere use of buzzwords, or potentially even only their use in the sense of greenwashing, this first dimension needs careful attention. Even though the SDGs themselves are well developed, it is unfortunately often less clear what exactly is meant by terms like internationalisation or global competence, a confusion mirroring the special, often fragmented structure of university organisations and hierarchies, which might lead to ineffectiveness or poor outcomes and hinder the realisation of such efforts [36–39].

A first step for achieving institutional clarity is the establishment of institutional guidelines clearly defining key concepts and their practical implications and desired outcomes, so that those with less background knowledge can easily understand what the new measures are aimed at. The bigger picture should be considered when setting up such guidelines. While it might be common to have separate efforts for dimensions such as sustainability, internationalisation, or global competence, the overlaps and synergies should be clear. To ensure such institutional guidelines have wide acceptance and effect, they must also align with the visions and needs, not only of the university management, but also of various stakeholders, such as industry, partners, and student associations. This can be achieved by involving key stakeholders in the process of setting up the document. In the sense of global competence, all of these stakeholders might have valuable perspectives that should be considered. Furthermore, it is important to ensure both definitions and practical implications are clear and detailed enough to work with (i.e., through the provision of clear indicators), as vague definitions might make it difficult to follow the guidelines. Intermediate-, medium-, and long-term goals might aid in breaking down an otherwise heavily digestible document into smaller steps that are easier to follow and track. Finally, it is also important to ensure that practical implications are clear and fit the specific context of the HEI. Other HEIs’ efforts provide a good source for inspiration, but descriptions and their relevance for the individual context must be critically examined; it is also good to keep in mind that other universities’ policy documents have a positive bias, and scientific journals rarely depict failing efforts, possibly leading to slightly distorted images being presented.

After the initial guidelines have been established, it is important to ensure all employees and other stakeholders are aware of the guidelines, where to find them, and who to contact for more information or clarification. Moreover, with globalisation leading to constant societal and technological transformations, successful guidelines should not remain stagnant, but evolve to address the changing contexts. New challenges and opportunities might emerge rather quickly, and there must be a level of flexibility and adaptability in any plan. Technological developments—and practical needs—drive the proliferation of new forms of education, such as digitalisation, distance learning, or virtual collaborations, and even as these come with their own set of problems, the future will most likely bring more innovative opportunities. Therefore, it is advisable to periodically revisit the sustainability, internationalisation, and global competence strategy plans, both to ensure they are properly aligned and co-supporting, and to evaluate whether revisions or updates are needed.
Nonetheless, an initial set of overarching guidelines is the first essential starting point to supporting an HEI’s holistic global competence development.

### 3.2. Institutional Diversity

A culturally diverse institution, in terms of faculty, staff, and students, is another important factor helping to enable global competence development. Research has shown that a home campus filled with people from different backgrounds and with different perspectives, although not enough in and of itself, provides fertile grounds for intercultural interactions [40,41], which is why inclusive recruitment strategies are an important starting point for globalised universities. It is important to note that culture and diversity should not only be seen in terms of nationality, but is rather viewed as comprising a host of individual factors, including for example nationality, ethnicity, religion, age, gender, social, educational, or professional background. Individuals from different backgrounds can contribute their vast array of different perspectives and thereby create an environment favourable of intercultural learning and global competence development.

To ensure institutional diversity, recruitment practices on both the employee (i.e., faculty and staff) and student sides should be strengthened. In this regard, cultural diversity among faculty and staff can be supported by means of considerate and wide-reaching recruitment strategies, as well as attractive relocation packages and support (e.g., housing arrangement, language and culture training). Additionally, the invitation of guest speakers, researchers, or lecturers from a broad variety of backgrounds can provide fruitful opportunities for creating diversity on campus. Cultural diversity among students can be achieved by marketing efforts to reach students worldwide, scholarship support for fee-paying students, expanded international mobility, and support in the new environment (e.g., language and culture training, or buddy or mentoring initiatives), as well as looking into ways of widening participation from local communities who are traditionally underrepresented. Minority students are certainly not a monolith, and the term can refer to one or more factors such as sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation, or age. Some students return to university after working for several years, others have to juggle their studies with work, family life, or other obligations. There are several types of potential backgrounds that can create struggles for individual students, and HEIs should be flexible in accommodating them and ensuring that they feel welcome on campus.

Nonetheless, diversity alone is not enough, and it has been repeatedly pointed out that just bringing people together does not automatically lead to positive outcomes [27,32,33,35]. Indeed, studies have found that intercultural experiences, if not carefully fostered, might potentially even have counterproductive outcomes for some individuals [42,43]. Therefore, it is also important to create an inclusive, open, and supportive environment when striving for sustainable institutional diversity. Attracting a culturally diverse staff and student body is a first step, but measures are needed to support them once they have arrived. Individuals who do not have a positive sense of belonging may disappear, cluster in their own small communities, or stop contributing as coping strategies. By providing an open and welcoming environment encouraging of intercultural interactions, an HEI lays the first ground stones for anyone on campus being able to develop knowledge, skills, and attitudes that are invaluable for becoming globally competent.

### 3.3. Global Competence Training for Everyone

Related to the diversity on campus is the importance of opportunities for global competence training for everyone. When institutional goals and efforts are clear, and when culturally diverse campuses provide fruitful grounds for intercultural learning, a first basis for comprehensive global competence development across the HEI is laid. However, it would be wrong to assume that intercultural learning will happen automatically, and the full potential of such learning can only be realised by providing holistic
and meaningful training for everyone, including all faculty and staff members, as well as students [35,41,44,45].

3.3.1. Student Global Competence Development

Students are typically perceived as the primary target group of global competence initiatives, and in some cases these efforts might almost be equated with student mobility [24,25]. Opportunities for international mobility, both physically (e.g., studies, internships, conferences, or study trips abroad) and virtually (e.g., virtual courses, collaborations, or e-exchanges), are important opportunities for students’ global competence development. Student mobility has clear advantages: mobile students have the chance to immerse themselves in the culture of others at their mobility destinations, while non-mobile students can experience greater diversity while at their home campuses. Within education for sustainable development, such mobility experiences might often be related to project-based courses directly working on local challenges to sustainable development. This offers great potential for global competence development [46–48], but only if students really do interact with a diverse array of others in a meaningful way and gain first-hand experiences with sustainability challenges and working on team projects.

While mobility is often the first thing thought of in relation to global competence development, usually only a minority of students participate in such experiences [49,50]. This can be by choice or by lack of means, which is why it is important to broaden the focus to all students who bring their diverse backgrounds to the campus. A more holistic and inclusive approach for student global competence development will furthermore sustain its integration throughout the students’ time at university, so that they continually have the chance to develop their competencies in tandem with sustainability education within their core subjects. Such learning can take place when they seize curricular, co-curricular, and extra-curricular opportunities on and around the campus [8,38–40], which is often referred to as internationalisation at home.

Curricular learning refers to formal classroom experiences, and ideally, learning for global competence should be integrated throughout the curriculum so that students have time to develop their competencies while at university [50,51]. This can be a difficult and resource-intensive task to manage, especially in fields that already suffer from full-packed curricula, such as engineering. Curricular learning can be achieved through specific courses, the integration of related learning in regular courses (e.g., through specific modules or lectures), or the integration of informal global competence learning as a by-product of considerate course activities. In the case of specific courses for global competence, it is crucial to ensure that courses fit students’ disciplinary needs and are grounded in the practice of their future professions. However, with stringent programme curricula, not all students have the chance—or desire—to participate in specific global competence courses. To ensure that they nevertheless can work on developing important knowledge, skills, and attitudes, it is vital to provide additional opportunities for such competence learning within programme course elements. This has the additional advantage of clarifying the competencies’ relevance to students by providing specific disciplinary connections while teaching them in an integrated way.

Co-curricular activities are those which complement the formal curriculum students are enrolled in, for example seminars, guest speakers, workshops or training, or certification programmes. While a campus-wide holistic integration of global competence throughout every student’s curriculum would be the ideal, several practical challenges exist: the resource-intensity of such a curriculum change, institutional/departmental/individual resistance to such changes, or students “switching” study programmes. Therefore, it is advisable to offer additional co-curricular opportunities for global learning, in which students from all programmes can participate. This has the further advantage of connecting students from different programmes and disciplines, allowing for interdisciplinary interactions, which are often lacking, especially during the first years of education, and providing ample potential for informal peer-to-peer learning.
Extra-curricular opportunities for learning take place in addition to students’ regular curriculum, including all types of campus events that provide opportunities for interaction, for example workshops, lunch lectures, culture events, or any other social activities [32,52,53]. While these are typically less connected to programme and course-related activities, HEIs have the chance to also support events that bring diverse students together and thereby encourage intercultural interactions and indirectly foster global competence through informal or peer-to-peer learning opportunities. Student-led activities, clubs, or associations may play an important role here. Additionally, some researchers have pointed out that shared residential facilities also provide good opportunities for intercultural interactions or friendships [54–56]. One substantial factor playing a role for all these types of opportunities is the encouragement and inclusion of all kinds of students in such activities. A point repeatedly stressed in our own survey was that international students felt isolated from the local students, and perceived them as not being interested in developing relationships. They were not alone in that, as this experience of social isolation has long been brought up in the literature on student mobility [32,44,53,54]. However, other researchers have pointed out that many international students tend to gravitate towards others from the same or culturally similar backgrounds [57,58]. Such considerations make it important for HEIs to create both opportunities and incentives for engaging culturally different individuals.

3.3.2. Faculty and Staff Global Competence Development

Faculty and staff members may often play a minor role in HEIs’ global competence development efforts. However, they are important points of contact for students, and their interactions with students may have notable effects on them. As they are teaching students and/or constitute students’ major contacts, these individuals’ own behaviour also has a certain role model effect. Additionally, many faculty and staff members have important research obligations or work in intercultural collaborations, both of which greatly benefit from globally competent individuals, which in turn positively affects the HEI’s internationalisation level. To take full advantage of those factors, it is important to ensure that faculty and staff are aware of the overarching institutional plan and goals, and possess the means to work towards them. Ideally, they are encouraged to join discussions regarding the HEI’s rationale, global competence learning outcomes, and the design of a systematic plan for its development. However, if such an overarching discussion is not possible and/or the institution already implemented an internationalisation rationale to work with, it is still advised to encourage discussions on smaller scales, such as on the departmental or programme levels. This ensures that participating members can make sure their programmes, courses, and activities align with the HEI’s overall goals, and that competencies to be acquired throughout programmes build up on each other.

The global competence of individual members of faculty and staff is important for both collaboration in international or interdisciplinary projects or research groups, and for supporting others in their global competence development. Therefore, they should be provided with opportunities for global competence training themselves. There are numerous ways to foster this process: everything that opens new perspectives and leads to self-reflection has the potential to increase global competence. Intercultural or interdisciplinary collaborations, specific courses or workshops, or mobility experiences provide great opportunities to broaden one’s horizons and gain important competencies [52,59,60]. However, the offer alone is not enough, and faculty and staff should further be encouraged to engage in their own global competence development and reflect on how culture affects their interactions and teaching. Culture—in all its forms—affects how people perceive the world, how they think and behave [59,61], and it is important that individuals become aware of the factors affecting them. Some may already be interested in such issues, but for others such “soft skills” may seem unnecessary, and perhaps especially so in fields such as engineering and the natural sciences. This is important because any activity or opportunity for increased cultural self-awareness must be well motivated to succeed.
To provide large-scale encouragement for global competence development, HEIs can allot resources (time, finances, or other support) for such endeavours, and put value on a well-rounded professional and personal profile during developmental or salary negotiation talks. While such efforts are often more pronounced on the faculty level, it is important to also put value on the staffs’ global competence development. While the own institution’s offers for global learning are great opportunities for personal development, it would be very valuable for faculty and staff to take advantage of all kinds of opportunities beyond these. Moreover, it is also beneficial to encourage faculty and staff to put their competencies into practice by seeking out new opportunities, and thereby strengthening their HEI’s profile. New initiatives could be internal (e.g., experience or skill exchanges through workshops or internal conferences) or external (e.g., establishment of collaborative courses or professional networks, virtually or face-to-face).

Investment in faculty and staff global competence development should be a major part of HEIs’ internationalisation initiatives, as they have the potential to exponentially increase internationalisation outcomes by supporting others—colleagues, collaboration partners, or students—in their global competence development. This can easily be achieved by respecting diversity and drawing on diverse perspectives and address barriers to intercultural learning. The marginalisation or isolation of individual students or groups, and/or stereotyping, are common dangers that the majority of faculty will experience in their classrooms at some point, and they need to possess the competencies to address such situations appropriately. Doing this will not only have the advantage of broadening their students’ horizons, but also provides fertile grounds for innovative ideas to problematise—a staple of state-of-the-art education.

Globally competent staff can specifically support students’ global competence development through the encouragement of meaningful interactions among diverse students on the home campus. By using the term internationalisation, international students are often at the focus of activities, while the vast diversity on most home campuses is often neglected and its potential untapped. All students are diverse in that they have different backgrounds affecting their personality and behaviours. While international students might need more support to find their way in a new environment, we suggest that all students should be encouraged to participate in activities that have the potential to lead to interactions and foster informal peer-to-peer learning for global competence. Additionally, some staff members may also play a crucial part in encouraging, preparing, and supporting students for international mobility.

A final important aspect, also repeatedly expressed in scientific publications on mobility, is the importance of providing language classes for all these groups—faculty, staff, and students—to reduce potential linguistic barriers to interaction and foster global competence development. While not playing a major role in our own study, other work focusing on different contexts have found that language is a major obstacle to intercultural interactions (see, for example, [44,53,54]).

3.4. Assessment of Outputs and Outcomes

A final important dimension paramount for an HEI’s strategy is the assessment of its efforts, which is usually a complex endeavour that requires much time, consideration, and resources. Nevertheless, assessment is an essential and invaluable part of any strategy. Scholars researching internationalisation have repeatedly called for HEIs to support their bold or visionary statements with real evidence on learning [25,62]. Once a clear and communicated institutional strategy exists, its assessment is needed to help monitor progress, identify strengths and weaknesses, and potentially correct the course to achieve overall visions and goals. Assessment can be done in several ways, but it is crucial to focus on both quantitative outputs and qualitative outcomes [27,36,63].

Outputs consist of quantitative data focusing typically on certain indicators, such as diversity among faculty, staff, and students, as well as numbers on mobility, or international collaborations or publications. This will give a good first overview of participation diversity,
numbers, and trends. Some of these numbers are typically also valuable for universities’ rankings in terms of internationalisation, which is why they already tend to be routinely tracked and collected. However, an additional analysis of popularity and trends concerning certain initiatives can, and should, be used to see which efforts are popular, which groups are reached, which ones lack interest—and why that could be. Collecting and evaluating such numbers is an important starting point for assessment, but a largely quantitative focus alone does not allow for much insight into real learning or competence development as a consequence of internationalisation efforts [36].

Outcomes refer to qualitative dimensions related to global competence, such as real learning and competence development. Their minor relevance for international rankings, comparatively higher complexity, and difficulty of assessment leads most universities to put less focus on them. However, without knowing if and how learning activities really benefit the development of global competence, it is difficult to achieve meaningful and sustainable learning, and impossible to know if objectives have been reached. Outcome assessment is difficult, especially regarding global competence development. Numerous different opportunities for global competence development and the complex nature of the competencies themselves make it almost impossible to reliably track where learning took place. Many HEIs might already have standards for places where such learning is highly likely to take place, such as mobility, courses that (partly) focus on intercultural exchange, sustainability, or global competence, and potentially even workshops or lunch lectures. Mobility-related experiences are often accompanied by experience evaluations or pre-/post-surveys, courses with a global competence focus will likely have some type of assignment or course assessment, and even smaller events such as workshops or lunch lectures often have a short evaluation form at the end. However, with the possible exception of courses, many of these rely on self-assessments, which have been criticised for providing inaccurate assessments due to people overestimating their own abilities [35]. In this regard, Soria and Troisi [64] raised the question of whether such self-reports would even reflect actual competence development. Faculty and staff, on the other hand, might obtain some sort of feedback in developmental talks with their supervisors or through course assessments by students, but the focus of such feedback may not be primarily on global competence, and may therefore provide just a partial insight. While other methods for assessment have been developed, Jesiek and colleagues [65] even assert that many assessment tools specifically aimed at measuring global competence in the context of engineering “lack robust validity and reliability evidence, and/or are not very scalable” (p. 471).

The assessment of global competence is a challenge that has long gained attention from scholars worldwide. This led to the emergence of numerous assessment models used by trainers and consultants aimed at assessing different competencies or aspects of global competence (see [66] for a comprehensive overview), but, as of now, no universally accepted assessment method exists. The main reason for that is the still changing focus on specific competencies and their importance for being globally competent. Until there is such an assessment tool able to capture global competence holistically and reliably—if this ever happens—it has been suggested that we combine several assessment methods focusing on specific parts of global competence. To overcome the shortcomings of individual assessment methods, scholars working with assessments typically share a preference for matching methods, such as observations, peer and instructor feedback, self-reflections, computer simulations, critical incidents, e-portfolios, narrative diaries, and oral presentations [63,67–70]. Especially valuable would be the longitudinal assessment of individuals’ development of competencies over time [63,71–73].

4. Conclusions

Higher education institutions (HEIs) have the responsibility to educate graduates so that they are ready to take on the global challenges that await them in the both interconnected and fractured globalised world of the 21st century. This was explicitly recognised by some of the higher engineering institutions studied for this paper, and it is equally true
for all HEIs. Going from this recognition to the mechanisms of systematically supporting education for sustainable development through global competence, we see a comprehensive strategy as the main catalyst for supporting the sustainable development of global competence and its constituent competencies. This article presented three lessons to be learnt by globally competent HEIs: (1) everyone throughout the HEI must be considered and involved; (2) approaches to global competence development must be strategic and planned; and (3) there are various ways and opportunities for creating such learning. The practical implications of these lessons were then presented across four major dimensions that HEIs have to consider in their attempts to foster sustained and comprehensive global competence development:

- Institutional clarity about goals and concepts, including institutional guidelines, clear definitions, and practical implications that are communicated throughout the institution and updated periodically to ensure everyone can work towards these goals as they relate to global competence development.
- Institutional diversity among faculty, staff, and students, as fruitful grounds for intercultural interactions and learning.
- Global competence training for everyone, as bringing people with different cultural backgrounds together is not enough, and individuals need initial support to foster important competencies before they themselves can effectively continue to develop these, and support others in doing the same.
- Assessment of outputs and outcomes to ensure the planning and resources spent on global competence development initiatives have the desired results, both in quantitative outputs (e.g., participation numbers) and qualitative outcomes (e.g., learning of certain competencies).

By carefully attending to these four dimensions in their planning, execution, and assessment, HEIs can ensure that efforts and resources spent will live up to their full potential, enabling systematic and impactful learning for global competence development as a key aspect of education for sustainable development. This is something from which all stakeholders, society included, stand to win. For the individuals involved, acquiring a competence needed to constructively, appropriately, and effectively work together with others will help with the realisation of the sustainable development goals and bring a brighter tomorrow. For HEIs, a sustainable systematic way of letting global competence permeate the educational structure with help them get the most out of their already-present diversity and internationalisation efforts. For society, educational organisations will deliver graduates better prepared to make a positive contribution to our common future to communities in a sustainable way.

**Supplementary Materials:** The following are available online at https://www.mdpi.com/article/10.390/su132011184/s1, File S1: Interview guide, File S2: Faculty and staff survey, File S3: Student survey.

**Author Contributions:** Conceptualisation, B.K.; methodology, B.K.; software, B.K.; validation, B.K.; formal analysis, B.K. and T.R.; investigation, B.K.; resources, B.K. data curation, B.K.; writing—original draft preparation, B.K.; writing—review and editing, B.K. and T.R.; visualization, B.K. and T.R.; supervision, B.K.; project administration, B.K.; funding acquisition, B.K. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research was co-funded by Erasmus+ 2018-1-ES01-KA203-050477.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Data available on request from the corresponding author B.K.

**Acknowledgments:** We would like to thank colleagues and students participating in this study.

**Conflicts of Interest:** The authors declare no conflict of interest.
References

1. United Nations General Assembly. Transforming Our World: The 2030 Agenda for Sustainable Development, a/RES/70/1. Available online: https://undocs.org/a/res/70/1 (accessed on 30 August 2021).

2. Halbe, J.; Adamowski, J.; Pahl-Wostl, C. The role of paradigms in engineering practice and education for sustainable development. J. Clean. Prod. 2015, 106, 272–282. [CrossRef]

3. McIsaac, G.F.; Morey, N.C. Engineers’ role in sustainable development: Considering cultural dynamics. J. Prof. Issues Eng. Educ. Pract. 1998, 124, 110–119. [CrossRef]

4. Harrison, T.E.; Kelly, W.E. Calling engineers to rise to the challenges of meeting the United Nations sustainable development goals (UN SDGs). In Proceedings of the International Conference on Sustainable Infrastructure 2019, Los Angeles, CA, USA, 6–9 November 2019; pp. 441–446. [CrossRef]

5. Hoven, J.V.D. Ethics and the UN sustainable development goals: The case for comprehensive engineering. Sci. Eng. Ethics 2016, 25, 1789–1797. [CrossRef] [PubMed]

6. Fischer, S.; Green, W. Understanding contextual layers of policy and motivations for internationalization: Identifying connections and tensions. J. Stud. Int. Educ. 2018, 22, 242–258. [CrossRef]

7. Kirk, S.H.; Newstead, C.; Gann, R.; Roun savage, C. Empowerment and ownership in effective internationalisation of the higher education curriculum. High. Educ. 2018, 76, 989–1005. [CrossRef]

8. Watson, M.K.; Lozano, R.; Noyes, C.; Rodgers, M. Assessing curricula contribution to sustainability more holistically: Experiences from the integration of curricula assessment and students’ perceptions at the Georgia Institute of Technology. J. Clean. Prod. 2013, 61, 106–116. [CrossRef]

9. Cruickshank, H.J.; Fenner, R.A. The evolving role of engineers: Towards sustainable development of the built environment. J. Int. Dev. 2007, 19, 111–121. [CrossRef]

10. Crawley, E.F.; Malmqvist, J.; Östlund, S.; Brodeur, D.R.; Edström, K. Rethinking Engineering Education—The CDIO Approach, 2nd ed.; Springer: New York, NY, USA, 2014.

11. ABET. Criteria for Accrediting Engineering Programs, Baltimore, MD, E001 11/24/2018. 2018. Available online: https://www.abet.org/wp-content/uploads/2018/11/E001-19-20-EAC-Criteria-11-24-18.pdf (accessed on 30 August 2021).

12. Shephard, K. Higher education for sustainability: Seeking affective learning outcomes. Int. J. Sustain. High. Educ. 2008, 9, 87–98. [CrossRef]

13. White, C.; Hastings, D. An international study of faculty perceptions on communication development in engineering education. In Engineering Education for a Smart Society. World Engineering Education Forum and Global Engineering Deans Council 2016; Auer, M.E., Kim, K.-S., Eds.; Springer International Publishing AG: Cham, Switzerland, 2018; Volume 627, pp. 272–283.

14. Rouvrais, S.; Gauthier Le Bris, S. Breadth experiential courses to flexibly meet new programme outcomes for engineers. In Advances in Intelligent Systems and Computing; Auer, M.E., Kim, K.-S., Eds.; Springer: Cham, Switzerland, 2018; pp. 326–342.

15. Jørgensen, U. Tensions in developing engineering design competencies. In Engineering, Development and Philosophy. American, Chinese and European Perspectives; Hyldgaard Christensen, S., Mitcham, C., Li, B., An, Y., Eds.; Springer, Philosophy of Engineering and Technology Series; Springer Science+Business Media: Dordrecht, The Netherlands, 2012; pp. 215–231.

16. The Organisation for Economic Co-operation and Development (OECD), Asia Society. Teaching for Global Competence in a Rapidly Changing World; OECD Publishing: Paris, France, 2018.

17. OECD. Preparing Our Youth for an Inclusive and Sustainable World; The OECD PISA Global Competence Framework Publishing: Paris, France, 2018.

18. Deardorff, D.K. The identification and assessment of intercultural competence as a student outcome of internationalization. J. Stud. Int. Educ. 2006, 10, 241–266. [CrossRef]

19. Arasaratnam-Smith, L.A. Intercultural competence: An overview. In Intercultural Competence in Higher Education. International Approaches, Assessment and Application; Deardorff, D.K.A.-S., Lily, A., Eds.; Routledge: New York, NY, USA, 2017; pp. 7–18.

20. Wiek, A.; Withercombe, L.; Redman, C.L. Key competencies in sustainability: A reference framework for academic program development. Sustain. Sci. 2011, 6, 203–218. [CrossRef]

21. Brandiers, K.; Barth, M.; Cebrian, G.; Cohen, M.; Diaz, L.; Doucette-Remington, S.; Dripps, W.; Habron, G.; Harré, N.; Jarchow, M.; et al. Key competencies in sustainability in higher education toward an agreed-upon reference framework. Sustain. Sci. 2020, 16, 29–39. [CrossRef]

22. Downey, G.L.; Lucena, J.C.; Moskal, B.M.; Parkhurst, R.; Bigley, T.; Hays, C.; Jesiek, B.K.; Kelly, L.; Miller, J.; Ruff, S.; et al. The globally competent engineer: Working effectively with people who define problems differently. J. Prof. Issues Eng. Educ. Pract. 2016, 27, 517–533. [CrossRef]

23. Grandin, J.M.; Hedderich, N. Global competence for engineers. In The SAGE Handbook of Intercultural Competence; Deardorff, D.K., Ed.; SAGE Publications: Thousand Oaks, CA, USA, 2009; pp. 362–373.

24. Almeida, J.; Fantini, A.E.; Simões, A.R.; Costa, N. Enhancing the intercultural effectiveness of exchange programmes: Formal and non-formal educational interventions. Intercult. Educ. 2016, 27, 517–533. [CrossRef]

25. Moskal, M.; Schweisfurth, M. Learning, using and exchanging global competence in the context of international postgraduate mobility. Glob. Soc. Educ. 2017, 16, 93–105. [CrossRef]

26. Knight, J. Internationalization remodelled: Definition, approaches, and rationales. J. Stud. Int. Educ. 2004, 8, 5–31. [CrossRef]
27. Coelen, R. A learner-centred internationalisation of higher education. In Global and Local Internationalization; Jones, E., Coelen, R., Beelen, J., De Wit, H., Eds.; Sense Publishers: Rotterdam, The Netherlands, 2016, pp. 35–42.
28. De Wit, H.; Hunter, F. The future of internationalization of higher education in Europe. Int. High. Educ. 2015, 2–3. [CrossRef]
29. Anderson, T.; Shattuck, J. Design-based research: A decade of progress in education research? Educ. Res. 2012, 41, 16–25. [CrossRef]
30. The Design-Based Research Collective. Design-based research: An emerging paradigm for educational inquiry. Educ. Res. 2003, 32, 5–8. [CrossRef]
31. Ryu, S. The role of mixed methods in conducting design-based research. Educ. Psychol. 2020, 55, 232–243. [CrossRef]
32. Yu, Y.; Moskal, M. Missing intercultural engagements in the university experiences of Chinese international students in the UK. Comp. A J. Comp. Int. Educ. 2018, 1–18. [CrossRef]
33. Lantz-Deaton, C. Internationalisation and the development of students’ intercultural competence. Teach. High. Educ. 2017, 22, 532–550. [CrossRef]
34. Groeppel-Klein, A.; Garmelmann, C.C.; Glaum, M. Intercultural interaction needs more than mere exposure: Searching for drivers of student interactions at border universities. Int. J. Intercult. Relations 2010, 34, 253–267. [CrossRef]
35. Gregersen-Hermans, J. From rationale to reality in intercultural competence development. Working towards the university’s organizational capability to deliver. In Global and Local Internationalization; Jones, E., Coelen, R., Beelen, J., De Wit, H., Eds.; Sense Publishers: Rotterdam, The Netherlands, 2016, pp. 91–96.
36. Gregersen-Hermans, J. Intercultural competence development in higher education. In Intercultural Competence in Higher Education. International Approaches, Assessment and Applications; Deardorff, D.K., Arasaratnam-Smith, L.A., Eds.; Routledge: New York, NY, USA, 2017; pp. 91–96.
37. Leask, B.; Charles, H. Internationalizing the curriculum. In Leading Internationalization. A Handbook for International Education Leaders; Deardorff, D.K., Charles, H., Eds.; Stylus Publishing: Sterling, VA, USA, 2018; pp. 65–73.
38. Dunne, C. Developing an intercultural curriculum within the context of the internationalisation of higher education: Terminology, typologies and power. High. Educ. Res. Dev. 2011, 30, 609–622. [CrossRef]
39. Cotton, D.R.E.; Morrison, D.; Magne, P.; Payne, S.; Heffernan, T. Global citizenship and cross-cultural competency: Student and expert understandings of internationalization terminology. J. Stud. Int. Educ. 2018, 23, 346–364. [CrossRef]
40. Tchibozo, G. Some research directions ahead. In Cultural and Social Diversity and the Transition from Education to Work. Technical and Vocational Education and Training: Issues, Concerns and Prospects; Tchibozo, G., Ed.; Springer Science+Business Media: Dordrecht, The Netherlands, 2013; pp. 225–226.
41. Islam, S.; Stamp, K. A reflection on future directions: Global international and intercultural competencies in higher education. Res. Comp. Int. Educ. 2020, 15, 69–75. [CrossRef]
42. Mitchell, L.; Paras, A. When difference creates dissonance: Understanding the ‘engine’ of intercultural learning in study abroad. Intercult. Educ. 2018, 29, 321–339. [CrossRef]
43. Bloom, M.; Miranda, A. Intercultural sensitivity through short-term study abroad. Lang. Intercult. Commun. 2015, 15, 567–580. [CrossRef]
44. Pham, L.; Tran, L. Understanding the symbolic capital of intercultural interactions: A case study of international students in Australia. Int. Stud. Sociol. Educ. 2015, 25, 204–224. [CrossRef]
45. Sengshyn, R.; Smith, P. Global awareness dialogue project: Exploring potential for faculty transformation through a professional development series. J. Transform. Educ. 2019, 17, 318–336. [CrossRef]
46. Paige, R.M.; Fry, G.W.; Stallman, E.M.; Josić, J.; Jon, J. Study abroad for global engagement: The long-term impact of mobility experiences. Intercult. Educ. 2009, 20, S29–S44. [CrossRef]
47. Paige, R.M.; Vande Berg, M. Why students are and are not learning abroad. A review of recent research. In Global and Local Internationalization; Jones, E., Coelen, R., Beelen, J., De Wit, H., Eds.; Sense Publishers: Rotterdam, The Netherlands, 2016, pp. 107–116.
48. Paige, R.M.; Vande Berg, M. Why students are and are not learning abroad. A review of recent research. In Global and Local Internationalization; Jones, E., Coelen, R., Beelen, J., De Wit, H., Eds.; Sense Publishers: Rotterdam, The Netherlands, 2016, pp. 107–116.
49. Deardorff, D.K. Assessing intercultural competence. New Dir. Inst. Res. 2011, 2011, 65–79. [CrossRef]
50. Tran, L.T.; Pham, L. International students in transnational mobility: Intercultural connectedness with domestic and international peers, institutions and the wider community. Comp. A J. Comp. Int. Educ. 2015, 46, 560–581. [CrossRef]
51. Meng, Q.; Li, J.; Zhu, C. Towards an ecological understanding of Chinese international students’ intercultural interactions in multicultural contexts: Friendships, inhibiting factors and effects on global competence. Curr. Psychol. 2019, 40, 1–14. [CrossRef]
52. Gareis, E. Intercultural friendship: Effects of home and host region. J. Int. Intercult. Commun. 2012, 5, 309–328. [CrossRef]
53. Graham, P.A.; Hurtado, S.S.; Gonyea, R.M. The benefits of living on campus: Do residence halls provide distinctive environments of engagement? J. Stud. Aff. Res. Pract. 2018, 55, 255–269. [CrossRef]
57. Halualani, R.T.; Chitgopekar, A.; Morrison, J.H.T.A.; Dodge, P.S.-W. Who's interacting? And what are they talking about—
intercultural contact and interaction among multicultural university students. *Int. J. Intercult. Relat.* 2004, 28, 353–372. [CrossRef]

58. Schwieter, J.W.; Ferreira, A.; Miller, P.C. Study abroad learners' metalinguistic and sociocultural reflections on short- and long-term international experiences. *Intercult. Educ.* 2018, 29, 236–257. [CrossRef]

59. Ikpeze, C.H. *Teaching Across Cultures: Building Pedagogical Relationships in Diverse Contexts*; Sense Publishers: Rotterdam, The Netherlands, 2015.

60. Rodríguez-Izquierdo, R.M. Researching the links between social-emotional learning and intercultural education: Strategies for enacting a culturally relevant teaching. *Intercult. Educ.* 2018, 29, 609–623. [CrossRef]

61. Paracka, D.; Pynn, T. Towards transformative reciprocity: Mapping the intersectionality of interdisciplinary intercultural competence. In *Intercultural Competence in Higher Education. International Approaches, Assessment and Application*; Deardorff, D.K., Arasaratnam-Smith, L.A., Eds.; Routledge: New York, NY, USA, 2017; pp. 43–52.

62. Leask, B. Internationalizing curriculum and learning for all students. In *Global and Local Internationalization*; Jones, E., Coelen, R., Beelen, J., de Wit, H., Eds.; Sense Publishers: Rotterdam, The Netherlands, 2016; pp. 49–53. [CrossRef]

63. Deardorff, D.K. *Demystifying Outcomes Assessment for International Educators*; Stylus Publishing: Sterling, VA, USA, 2015.

64. Soria, K.M.; Troisi, J. Internationalization at home alternatives to study abroad: Implications for students' development of global, international, and intercultural competencies. *J. Stud. Int. Educ.* 2013, 18, 261–280. [CrossRef]

65. Jesiek, B.K.; Woo, S.E.; Parrigon, S.; Porter, C.M. Development of a situational judgment test for global engineering competency. *J. Eng. Educ.* 2020, 109, 470–490. [CrossRef]

66. Griffith, R.L.; Wolfeld, L.; Armon, B.K.; Rios, J.; Liu, O.L. Assessing intercultural competence in higher education: Existing research and future directions. *ETS Res. Rep. Ser.* 2016, 1–44. [CrossRef]

67. Bartel-Radic, A.; Giannelloni, J.-L. A renewed perspective on the measurement of cross-cultural competence: An approach through personality traits and cross-cultural knowledge. *Eur. Manag. J.* 2017, 35, 632–644. [CrossRef]

68. Perry, L.B.; Southwell, L. Developing intercultural understanding and skills: Models and approaches. *Intercult. Educ.* 2011, 22, 453–466. [CrossRef]

69. Thomas, D.; Elron, E.; Stahl, G.; Ekelund, B.Z.; Ravlin, E.C.; Cerdin, J.-L.; Poelmans, S.; Brislin, R.; Pekerti, A.; Aycan, Z.; et al. Cultural Intelligence. *Int. J. Cross Cult. Manag.* 2008, 8, 123–143. [CrossRef]

70. Huang, L. Co-curricular activity-based intercultural competence development: Students’ outcome of internationalisation at universities. *Innov. Educ. Teach. Int.* 2016, 54, 184–193. [CrossRef]

71. Van de Vijver, F.J.R.; Leung, K. Methodological issues in researching intercultural competence. In *The SAGE Handbook of Intercultural Competence*; Deardorff, D.K., Ed.; SAGE Publications: Thousand Oaks, CA, USA, 2009; pp. 404–418.

72. Arasaratnam-Smith, L.A. Developing global graduates: Essentials and possibilities. *Res. Comp. Int. Educ.* 2020, 15, 20–26. [CrossRef]

73. Fantini, A.E. Assessing intercultural competence: Issues and tools. In *The SAGE Handbook of Intercultural Competence*; Deardorff, D.K., Ed.; SAGE Publishing: Thousand Oaks, CA, USA, 2009; pp. 456–476.