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Review

Online and Hybrid Teaching Effects on Graduate Attributes: Opportunity or Cause for Concern?

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Abstract: The opportunity to develop graduate attributes beyond disciplinary expertise is an essential component of any degree programme, and students should develop these during their time within higher education. Graduate attributes can be considered as high-level skills and qualities beyond technical knowledge, which enable higher education institutions to produce more employable graduates. However, there are significant challenges in developing such skills and qualities, where remote teaching and learning complicate this further. Online teaching does not wholly derail the opportunities for students to achieve existing graduate attributes—in contrast, it also creates opportunities for innovation and shapes graduates in preparation to be the next-generation workforce. In this paper, we aim to study and synthesise existing knowledge on the effect of online hybrid teaching on graduate attributes. A systematic literature survey was completed revealing that educational institutions continue using online or hybrid instructional modes, affecting graduate attributes positively and negatively. Therefore, to effectively develop graduate attributes, there is a requirement for fundamental changes in instructional strategies, teaching–learning behaviours, upgrading of facilities and curriculum adaptations. We review graduate attributes in the higher education literature, including the impacts resulting from remote teaching and learning. The paper also identifies the general challenges to developing graduate attributes, as well as more specific challenges as a result of hybrid and online teaching and learning.

Keywords: graduate attributes; remote teaching; higher education; skills and qualities; employability; next-generation workforce

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1. Introduction

The novel coronavirus (COVID-19) outbreak brought the world to a standstill when it led to a deadly pandemic in the early part of 2020. As social distancing and self-isolation along with safe hygienic practices became essential preventive measures in the fight against the pandemic, this had significant ramifications on the education sector. Physical or social distancing was viewed as one of the most important measures introduced by governments across the world to reduce harm to human health. The reduction in interaction with individuals minimised community transmission, especially in densely populated localities such as educational institutions [1]. Instructions from public health officials resulted in the closure of universities, colleges and schools and helped to curb the rate of fatalities [2]. The closure of educational institutions in return required taking an approach to unfamiliar environments and practices, whereupon online teaching and learning subsequently became commonplace. Pivoting to emergency remote teaching presented challenges linked to the development of graduate attributes and the consequential impact on employability.

Hence, this study primarily aims to consider how online and hybrid teaching affects graduate attributes and whether it is an opportunity or cause for concern, and the question is answered through achieving the following objectives:

- Investigate graduate attributes in higher education;
- Study the impacts of remote teaching and learning on graduate attribute development;
- Identify the general challenges associated with developing graduate attributes and challenges due to hybrid and online teaching and learning.

The background literature is reviewed under the subtopics of Sections 2–4. The findings will be discussed as the Sections 5.1 and 5.2.

2. Graduate Attributes

Graduate attributes are what are known as the skills, knowledge and potential of graduates, applicable to a range of contexts and disciplines. It is an intended quality perceived by some university students as one of the fundamental outcomes to be displayed at the point of graduation. These outcomes are developed regardless of the domain or discipline of knowledge intended. This does not imply that they are necessarily independent of disciplinary knowledge, but rather that they are the key abilities imbued in a graduate in recognition that they are not simply bound to the knowledge, skills and attitudes of their subscribed discipline. These outcomes are the repercussion of the habitual standards established in higher education, hence do not necessarily require the formulation of a system to embed the attributes into one's curriculum. Rather, they are expected to be developed from and intimately linked to the contemporary higher education experience [3].

Developing graduate attributes is a lifelong learning process. From adaptability to the acceptability of graduate attributes when put into practice in a professional capacity, the learning of the attributes in itself does not seem to cease. The core sets of attributes that we consider as graduate capabilities vary remarkably over time, apart from a visible rise in those of technological skills. The 'USEM' model posited by [4] visualises the concept of graduate attributes in the context of employability (Figure 1). This demonstrates the interpersonal skills that have to be developed within oneself to be found favourable in the eyes of recruiters, such as that derived from 'E', which stands for the persuasive importance of a belief in efficacy. The study also tabulated data (refer to Table 1), which was foreseen as a favourable feature when recruiting fresh graduates as opposed to their more senior colleagues. Universities have come to accept their capability to represent an output from university education for knowledge workers, professionals and citizens.

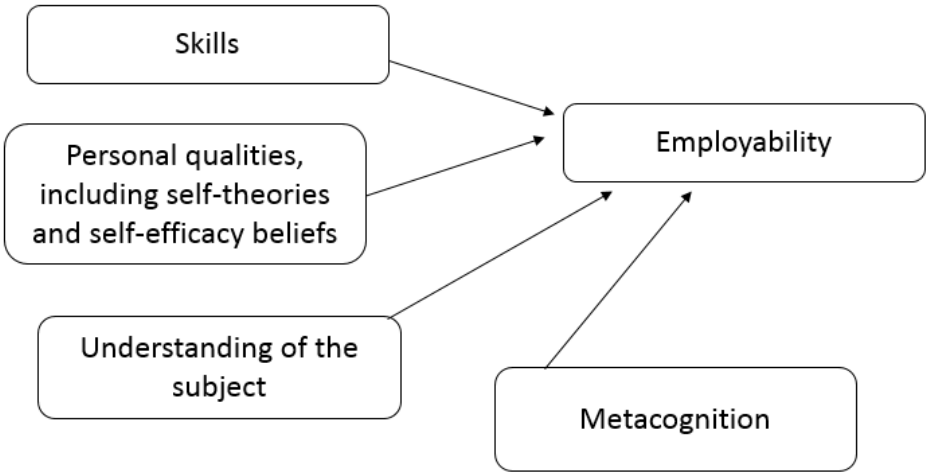

Figure 1. Simplified schematic representation and reproduction of the USEM model of employability with inter-relationships having been removed to highlight contributions that each make to employability. Adapted from [4].

Table 1. Main features of employability as reported by recently recruited graduates and their more senior colleagues [4].

Recently Recruited Graduates	More Senior Colleagues
• Personal qualities	• Personal characteristics
• Communication skills	• Communication skills
• Degree experience	• Quality of, and performance in, education
• Work experience	• Work experience

Graduate attributes are now identified as one of the critical outcomes of the modern world's tertiary education provision. Conceived from the notions of the diverse and swiftly altering obligations of the modernised workplace of the 21st century is the need for graduates to correlate and to be able to demonstrate their knowledge, skills and abilities beyond acquisition and retention of knowledge. The implication for universities to deliver the promise of a future-oriented education system and the progression of minds which "synthesize knowledge" and broaden their horizon for "new and unfamiliar ways" is now more critical than it has ever been before, as education sectors globally have had to brace themselves for a period of consequential reform resulting from the pandemic [5].

In organisations the world over to which graduates are destined, the assignment of tasks is typically rationalised within project teams. In so doing, the assemblage of knowledge is sought to be interdisciplinary, rather than being a product of mono-disciplinary activities. Thus, employers seek graduates who communicate well and have developed to be better team workers, proficient in interpersonal behaviour. The communication skills acquired are not limited to written correspondence, but include verbal engagement with colleagues and clients to persuade and network within and beyond the organisation. Interpersonal skills are in a large part built on emotional intelligence, which includes acknowledging and analysing ideology and concerns from others' points of view, understanding how to interact effectively in numerous settings and being tactful and forceful when required [6].

Worldwide over the last three decades, sustainable development in higher education has come to be an inevitable issue of discussion. 'Agenda 21' [7] is a comprehensive non-binding action plan devised by the United Nations towards achieving sustainable development. The initial aim of the initiative was to achieve global sustainable development by the 21st century: "Since Agenda 21 and the United Nations' Decade for Education for Sustainable Development published, higher education institutions have been recognised as playing a critical role in shifting our society's awareness toward sustainable development. Due to the unique role they play in society, universities have a responsibility to educate the next generation toward a sustainable future" [8]. "As recognized in Agenda 21 and related international declarations and initiatives directed to higher education, universities have the potential to contribute to the social, environmental, and economic sustainability of communities" [9]. These macro-level influences shape the world in which education and employment develop whilst demanding that graduates have the capabilities to contribute to sustainable development.

3. Generic Skills of Graduates

Generic graduate attributes are the "skills, personal attributes and values which should be acquired by all graduates regardless of their discipline and represents the central achievements of higher education as a process. Such qualities include critical thinking, intellectual curiosity, problem-solving, logical and independent thought, communication and information management skills, intellectual rigour, creativity and imagination, ethical practice, integrity and tolerance" [10]. These qualities are also considered a means to prepare graduates as representatives of social good in an environment of considerable uncertainty, caused by the ongoing effects of the COVID-19 pandemic.

"An environment of radical uncertainty and complexity both brings about changes in human beings and calls for changes. The changes are at once substantive new knowledge, new adaptations and new skills" [10]. An increase in student intake and the corresponding effect it has had on teaching practices, the casualisation of academic staff and recognition and honour of good teaching skills are all viewed as challenging tasks together with current environmental and institutional factors. The increased focus on graduate skills in higher education stems from global trends of expanding vocationalism, mass education and marketisation [11], as well as the resulting increase in rivalry or competition amongst universities around the world. External stakeholders such as government and business are concerned about acceptable employability and professional results for graduates as universities take on a more vocational role [11].

The world continues to change in numerous ways, from the impacts of climate change to economic and political uncertainty and global health crises. As change becomes the only constant, technologies, systems, institutions, languages and social practices are changing together with ever-increasing rapidity. Hence, it is safe to assume that the fundamental educational problem faced in an ever-changing world is neither one of knowledge nor of skills, but is the one of being. To elucidate, "the educational challenge of a world of uncertainty is ontological in its nature" [12]. Therefore, it is of utmost importance that tertiary education needs to be subjected to a fundamental shift, so as not to abandon the apprehensions involving either knowledge or skills but to place at its core a new concern with being as such [13]. Thus, the role of adopting, developing and coalescing attributes for graduates to deal with unprecedented change becomes more relevant.

As the importance of developing generic attributes in higher education grows, institutions are emphasising which generic skills their graduates achieve as part of their mission and objectives, and educators are being required to document how their courses and programmes support the development of those skills and attributes. The mapping of chances for graduate attribute development in the planned curriculum thus plays a significant role in quality assurance and reporting processes, and embedding these opportunities in curricula may ensure that the espoused curriculum and the edified curriculum are in sync [10]. A recent UK-based study reveals that the most commonly cited graduate attributes from universities can be categorised into the following four areas: self-awareness and lifelong learning; employability and professional development; global citizenship and engagement; and academic and research literacy [14].

Professional work experiences recorded from recent graduates in Australia identified that communication, time management, teamwork, working with people, working across cultures, project management and business skills were some of the major professional skills required for their professional work [15]. A discussion from this study and its subsequent findings raised questions about the adequacy of the graduate attributes approach in the development of professional skills, such as the ability to work across cultures and on multiple projects, which are major requirements of graduates in many workplaces. Graduate attributes which help to prepare individuals for work therefore require input from a wide range of employers to assist in shaping and defining them.

Top-down embedding of graduate attributes has the potential to be met with limited success. Taking a bottom-up approach offers an opportunity to improve the understanding of which graduate attributes actually constitute the outcomes of universities. The experiences of research students in three peer support groups, using the results of an exploratory opinion survey that required sharing their learning experiences about the development of graduate attributes, were collected. Participants favoured five attributes based on their past and present experience: communication; critical thinking; self-motivation; research organisation; and teamwork. Viewing the development of graduate attributes through the lens of the students improves our understanding of how peer support groups help to develop graduate attributes and contribute to university efforts to inculcate these attributes by taking into account experiential learning [16]. Table 2 lists how a variety of generic skills and graduate attributes have been described by three different universities. There-

after, the generic skills have been evaluated individually to produce the most favourable as preferred by the graduates subjected to the test (Table 3). It is apparent from the results that students are self-motivated when proficiency in communication skills paired with critical thinking, problem-solving, inquiry and innovation are embedded into their curriculums where the importance of peer learning and team activities play a major role to develop these skills.

Table 2. Graduate attributes of Otago, Canberra and the University of Putra [16]. Note that some attributes not identified are either explicitly or implicitly referred to in other categories. For example, at Otago, 'creativity' is referred to under 'critical thinking'.

Attribute	Otago, New Zealand	Canberra, Australia	Putra, Malaysia
Communication Proficiency	☑	☑	☑
Creativity		☑	
Critical Thinking, Problem Solving, Inquiry, Innovation	☑	☑	☑
Cultural Understanding	☑		
Environmental Literacy	☑		
Ethical and Professional Practice	☑	☑	☑
Information Literacy and Management Skills	☑		
Knowledge		☑	☑
Leadership Skill			
Lifelong Learning			☑
Provision of Professional Services			☑
Research and Organization	☑	☑	☑
Self-Motivation	☑		
Teamwork	☑		

Table 3. Top five graduate attributes listed by the students [16].

Attributes	Otago, New Zealand	Canberra, Australia	Putra, Malaysia	All Universities
Communication	3	2	8	13
Creativity	3	0	1	4
Critical Thinking, Problem Solving, Inquiry, Innovation	5	2	4	11
Cultural Understanding	1	1	4	6
Ethical and Professional Practice	4	0	1	5
Information Literacy and Management Skills	1	0	4	5
Knowledge	2	1	3	6
Leadership Skill	2	0	2	4
Lifelong learning	0	0	2	2
Research and Organization	4	1	4	9
Self-Motivation	3	2	5	10
Teamwork	2	0	7	9

Graduate employability has expanded in recent years to encompass a multitude of abilities, traits and other factors. Work-integrated learning is seen as a critical technique for encouraging graduate employability, via experiential learning and reflection [17]. Work-integrated learning experiences should be included in the curriculum and supported by suitable pedagogical tools, as well as by providing quality assessments to enhance employability outcomes. While necessary, such assistance has resourcing consequences for higher education, including effects on staff workload that must be considered. Employability has been examined in relation to the construct of job outcomes, pointing to ways in which these two viewpoints can be better integrated [18].

Commentators often make a strong case for the contextualisation of skills [19] and that the ability to contextualise is as important as the skills themselves [20]. Learning for a future context has been thoroughly analysed and approaches recommended [21] that include the idea that university education should prepare students for an unknown future and to deal with situations that are new or are yet to be experienced. The authors propose that an effective way of achieving this is to use their different ways of seeing an approach and cite the need for variation in experiences as an effective way of learning and, by extension, preparing students for their future [21]. This dovetails neatly with our previous commentary on an ever-changing world.

The most ubiquitous method of instilling graduate qualities is to include them in the curriculum of a bachelor's degree programme. Due to the additional responsibility and leadership involved in mentorship within the working environment, mentors for the peer-assisted study sessions (PASS) programme at a research-intensive university in New Zealand reported developing a range of graduate attributes, such as communication, critical thinking and ethical responsibility. Co-curricular programs like PASS can provide students with additional opportunities to acquire and enhance graduate-level skills. While not all students will be able to be mentors on programmes such as PASS, the data can be used to guide other initiatives aimed at developing graduate characteristics. If these programmes provide students with genuine responsibilities, they may be more effective at developing graduate characteristics [22].

A variety of university programmes employ small-group dialogue within collaborative learning to improve students' learning outcomes and cultivate graduate qualities. Students in small groups work with others in a peer-to-peer learning style, taking responsibility for their own learning and expanding their comprehension of the subject. Blended learning, which combines traditional face-to-face classroom approaches with online instruction, is one solution which has seen unparalleled growth and widespread adoption since the onset of the COVID-19 pandemic. The goal of one piece of research [23] was to test a novel blended learning approach that involved customising peer-to-peer learning through classroom discussion and an online discussion board. A survey was completed at the end of the course to assess this method; the majority of students reported that this approach helped improve their communication skills and connect with other classmates [23]. Such evidence goes some way to advocating blended models for graduate attribute development in the future.

Employers, the community and graduates all share some (often differing) expectations of what graduates will be able to demonstrate in terms of competence and capability. Some universities have responded by compiling a list of desirable graduate characteristics that must be incorporated throughout all programmes. Over the last decade, a number of universities have found that focusing on teaching and assessing graduate attributes has proven to be a huge problem, as academic staff found adjusting their assessment processes to be one of the most difficult tasks they face. As a result, assessing graduate qualities proves to be a good indicator for identifying key issues at hand, and it identifies and acknowledges the role that academic staff beliefs about graduate attributes play in their approach to teaching and assessing; it considers the impact of these beliefs on staff engagement in an informed and pedagogically sophisticated way in assessing graduate attributes. Only by engaging thoroughly in this task can the custodians of the curriculum, especially academic staff, ensure that their students are engaged in developing the traits they need to be who they want to be [24].

The COVID-19 pandemic has had an unprecedented impact on higher education, learning, teaching and assessment, which directly and indirectly impacts on the general skills development of graduates. For example, remote teaching and learning have been limiting opportunities for student interaction, particularly causing significant disruption to practical activities (such as laboratory-based exercises, field visits, etc.) and group-related activities (such as group projects) [25,26]. Conversely, remote and blended teaching and

learning have enabled opportunities for students to develop new digital skills that were not traditionally required in face-to-face modes [27,28].

4. Embedding Graduate Attributes in Curricula

Universities have attempted to define the outcomes of tertiary education by describing the characteristics of their alumni [13]. In acknowledgement of their responsibility to provide graduates with qualities needed for lifelong learning in a fast-changing world and workplace, the majority of institutions have begun engaging in the processes of graduate attribute development. There has for some time been a well-documented mismatch between employers' expectations of graduates and the competencies possessed by those leaving university and entering the workplace [29,30], and this remains an area of concern today [31,32]. This concern has paved the way for a rise in attention by universities to ways of achieving and recognising the importance of skills appropriate for the world of work. There is a definite need to improve students' employability, particularly their awareness of ethical issues, global sustainability and equitable issues, such as multicultural sensitivity [33], for those students to be valuable to not just employers but society overall.

A professional or occupationally competent person possesses the qualities required to carry out the activities of their profession or activity to the standards expected in independent employment or practice. Several accrediting bodies of qualifications have developed or are in the process of developing outcomes-based criteria for evaluating programmes and professional competencies. A highly visible example of this within the context of UK education is through apprenticeships that include the assessment of knowledge, skills and behaviours [34]. Statements of graduate qualities and professional competency profiles have been produced as a result of these educational and professional accords for mutual recognition of qualification and registration of competence.

Rather than a straightforward strategy that has additional units of study, educational research promotes the integration of these attribute developments within existing curricula [35]. Such revised policies ought to provide coherence between the degree and the graduate attributes aimed at to be developed. Further research conducted by [35] provided the research conclusions in Figure 2 by articulating each graduate attribute as a piece of a puzzle that creates one whole picture—that of an employable graduate—when viewed together.

Figure 2. Enabling graduate attributes and translation-level attributes. Adapted from [35].

Whilst universities appear to have accepted their new vocational role, there is a great deal of disagreement on how graduate capabilities should be defined and applied. For example, critics make clear that being able to describe a skill is not evidence that the skill was demonstrated [36]. Stakeholders such as government and business, as well as universities, have grossly overestimated the cultural, institutional and policy reforms needed to implement the graduate skills agenda to date [11]. If universities are to play a proactive rather than reactive role in developing this agenda, these concerns must be addressed by the wider higher education sector [11].

One case study evaluated integrating graduate attributes into the curriculum, where the attributes were embedded into subject modules. Thereafter, each course was evaluated with relevance to the impact caused by the graduate attributes in the learning activities, learning objectives and assessments. However, the authors believe that this still may not be sufficiently aligned (i.e., the development of graduate attributes) with the student experience [10]. This supports the notion that embedding institutional-wide attributes at a unit level has limitations.

Academic staff acceptability and the capacity to transfer top-down policy into teaching practice remain crucial in efforts to systematically integrate graduate qualities across university courses. When teaching staff from 16 institutions were polled about their views on graduate characteristics and their desire and confidence to teach and assess them, 73% believed graduate characteristics were important. There was, however, a significant gap between beliefs and actual focus stated in practice, according to the study conducted [37]. The major influences on graduate attribute teaching and assessment, as well as the implications for policy development and implementation, were considered (Figure 3) to work towards improved graduate attribute outcomes in universities. The willingness, confidence and motivation of academic staff to include the cultivation of more generic attributes within modules and programmes remain a key challenge, with contextualisation to specific industrial sectors being even more so.

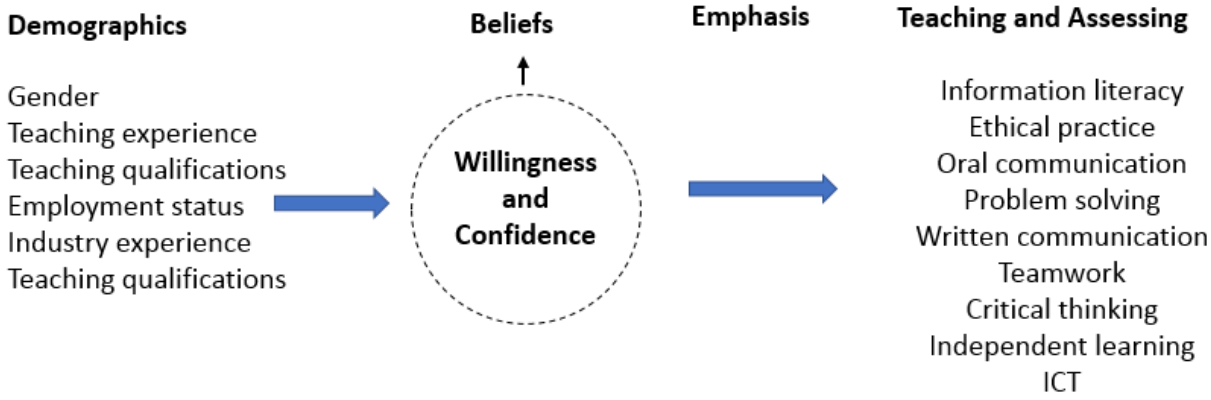

Figure 3. Major influences on the teaching and assessment of graduate attributes. Adapted from [37].

Graduates who are better equipped for employment are clearly preferred by employers and professional bodies as well as society at large. The University of Technology Sydney (UTS) 'WorkReady Project' [38] is a curriculum renewal programme aimed at improving graduates' professional skills and employability characteristics. Professional society representatives were questioned about their perceptions of the qualities expected of today's graduates. These were used to construct a matrix for the creation of possible learning activities. Each workable activity (Figure 4) provides tools for learning and teaching that may be downloaded and integrated into existing subjects. The project's website is evaluated, and recommendations for integrating and embedding improved work-ready learning throughout UTS's diversified professional and disciplinary curricula are provided.

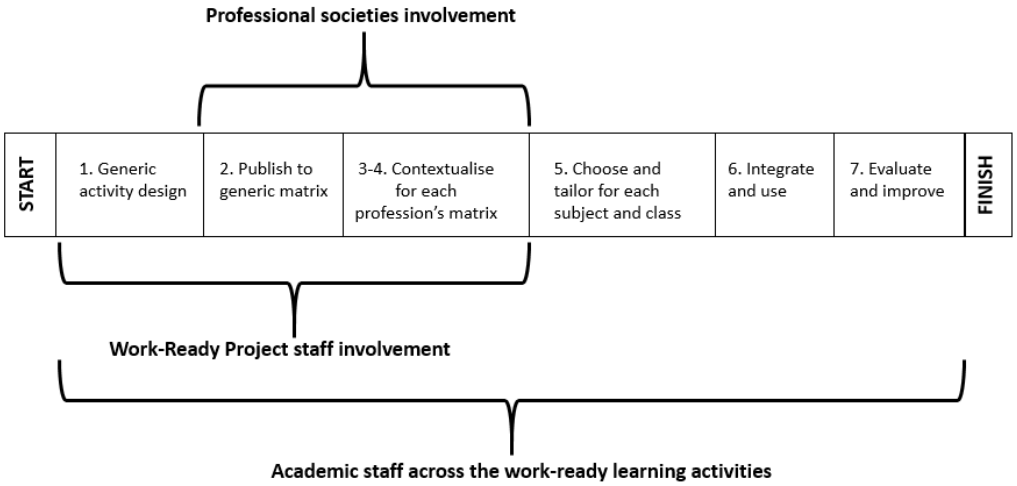

Figure 4. Level of academic staff involvement in the contextualising process. Adapted from [38].

Curtin University's 'Curriculum 2010′ (C2010) strategy sought to ensure quality and long-term degree programmes. Graduate attributes were not universally emphasised prior to C2010, indicating that there was space for growth in general abilities. C2010 focused on three ways of embedding graduate attributes. The first was embedding graduate attributes in degree programmes and mapping them to ensure that outcomes and assessments were aligned constructively. The second technique involved evaluating programmes based on data, such as graduate, employer and programme team viewpoints on the relative values of graduate traits and the amount to which they are commonly displayed or developed. The third method was to implement a university-wide portfolio system that allowed students to examine their own and their peers' graduation characteristics [39].

As explored by [39], they outline the experience of a curriculum alignment process, specifically discussing how a Bachelor of Commerce extended curriculum programme infused intended graduate attributes into the curriculum. Document analysis was used to assess the Analytical and Critical Thinking—Foundation module outline to consider how graduate attributes were constructively connected with learning outcomes, teaching–learning activities, assessment criteria and assessment techniques. A focused interview with the lecturer was conducted to establish how they felt about the curriculum alignment exercise. It was discovered that constructive alignment is critical to good teaching and that the extended curriculum programme is just as important as regular programmes for embedding graduate attributes. This provides a context for lecturers to align the curriculum, adjust their teaching and assessment practices and reflect on their classroom practices [40].

Whilst performing research based on integrating graduate attributes via an online assessment system, it was found that, although the online system was successful in supporting the incorporation of graduate traits into assessment criteria, there were several areas that needed addressing [33]. The first area pertains to the study's principal goal of aligning graduate attributes in the curriculum. It will be important to create an online wizard and database to aid academics in developing attribute-coded evaluation criteria, as the process is challenging without one-on-one support. The graduation attribute categories must be distinct and easy to understand. Assessment criteria must be gradable by tutors or lecturers at various levels. For example, academic honesty about actual student achievement should not be used as a criterion because it cannot be graded. Secondly, there is a need to clarify what constitutes staff feedback to students. Consideration should be given as to whether student self-evaluation can be conducted multiple times, both formatively and summatively, and then locked in after marking. Another consideration is whether a student's self-assessment is visible to the marker, as some students were afraid that its presence would influence markers. According to the results of the online survey, students could benefit from some training on how to utilise and operate an online platform. Once an online introduction is built for students to use, this training might be completed [33].

Barrie et al. [41] present a framework formulated of eight core elements, producing a way in which university communities may successfully renew, build and implement their curriculum to achieve graduate attributes. The framework brings to light different understandings that people have about graduate attributes, the influence these have on designing the curriculum and the approach towards developing graduate attributes. The explicit embedding of graduate attributes being essential in policy implementation is also discussed within the framework. The eight elements that form the framework comprise: 1. Conceptualisation; 2. Stakeholders; 3. Implementation; 4. Curriculum; 5. Assessment; 6. Quality Assurance; 7. Staff Development; and 8. Student-Centered. The framework was modelled and developed considering wider research literature, institutional reports including policy statements and audit reports, responses from interviews conducted at 36 universities and insights shared by colleagues [41].

During the COVID-19 pandemic, some researchers have investigated how to develop reflective skills through artful methods. For example, [42] explored the incorporation of arts and humanities in engineering education to foster reflective thinking in next-generation engineering graduates. They believe that enhancing student reflective thinking skills through embedding arts is an essential part of the post-COVID engineering curriculum. In light of the rapid changes observed since the pandemic started, some other researchers believe higher education should further strengthen critical thinking skills in the curriculum, considering it one of the key real-life competencies for a post-COVID world [43].

5. Findings

Findings are discussed under two subheadings: 'Impact of hybrid and/or online teaching on graduate attributes during the pandemic,' and 'The general challenges to developing graduate attributes due to hybrid and online teaching and learning'.

5.1. Impact of Hybrid and/or Online Teaching on Graduate Attributes during the Pandemic

The COVID-19 pandemic provoked rapid changes to education governance, delivery and assessment, with the ongoing legacy of moving to a world in which remote learning is largely established in many university settings. Fully or partially online courses were becoming more common before COVID-19 for a variety of reasons, including the demand for more flexibility for workplace-based learners (e.g., degree apprenticeships) [44] and the benefits that technology may provide. One significant problem is that the majority of today's educators did not receive their education online and thus must learn how to teach successfully by utilising new technological approaches [45]. This expanding online trend also applies to language education, an area that necessitates special attention due to its specific challenges: language teaching entails skill development and often uses the target language as the medium of communication. The effectiveness of hybrid and online courses is dependent on teacher training and continued support.

With the help of semi-structured interviews and a qualitative technique, [46] analysed students' experiences over the course of three years, participating at a national undergraduate research conference, along with evidence of the graduate attributes that emerged. The students displayed intellectual autonomy, repurposing their work for presentation to a multidisciplinary audience by conversing with and benchmarking against colleagues. They also demonstrated increased confidence in expressing their identity and progressing toward self-authorship by intentionally balancing the contextual character of their disciplinary knowledge with intra-personally grounded goals and ideals [46]. Such findings help to support an approach to experiential learning which is not overtly traditional and can support and develop learning relevant to students' futures.

A study was undertaken to determine whether there was a link between student learning results and two teaching models: traditional face-to-face delivery and a hybrid flexible delivery approach. The hybrid flexible model uses a combination of in-person seminars and electronic communication methods to convey information. It was discovered that students who studied using the flexible delivery paradigm performed better academically. It

also demonstrated that, when educating a large number of students, flexible delivery teaching models leveraging electronic delivery media may be employed to attain the benefits of small class sizes [47]. This is therefore envisioned as a viable response to the problems of providing post-secondary education to increasing numbers of students, as well as addressing the perceived desire for flexible course delivery that can improve students' learning results, especially during times such as the COVID-19 pandemic.

As mentioned in the most recent literature, the results of assessing employability skills development for students doing professional practical work during the social-isolation phase demonstrate that students have been exposed to a range of employability skills that will likely become more common for the workplace going forward [48]. Further research shows that the implementation and use of distance methods of learning can have other positive consequences, such as improvement in students' competence in terms of soft skills, including communication and collaboration capabilities [49]. Additionally, there is a significant positive effect of COVID-19 confinement on students' performance. The results indicate that students obtained better scores in all kinds of tests that were performed after the beginning of confinement [50].

As supported by earlier literature, authentic learning in an open online environment may provide a framework for teaching staff to establish generic graduate characteristics. When collaborative technologies are used during these periods, new forms of communication are enabled, allowing students to fully engage with the academic process in ways that are difficult to achieve with traditional classroom-based teaching approaches. One such study used a blogging platform to build a collaborative open online course to promote graduate qualities in undergraduate students. The results show that students appeared to have developed at least some generic graduate attributes, such as a personal and internally motivated approach to learning, the ability to consider alternative points of view and acknowledge different perspectives, the confidence to challenge knowledge and authority and skills as empathic communicators [51]. This demonstrates that, by using technology in certain ways which may be familiar to undergraduates, it helps to develop graduate attributes.

In contrast, several negative points have also been recognised in some studies. For example, Coman et al. [52] focus on identifying the way in which Romanian universities managed to provide knowledge during the coronavirus pandemic, stating that students' lack of active learning and critical thinking skills, their lack of ability to debate and express their opinion, actions that the educational system did not foster or develop, are now becoming prominent in the higher education system in the process of online learning. One method to be prepared as an example of social good has been to develop graduate attributes from inside oneself. However, there are considerable obstacles to overcome in order to develop these attributes.

5.2. The General Challenges to Developing Graduate Attributes due to Hybrid and Online Teaching and Learning

In the context of the crisis created by the pandemic, education systems underwent two major changes: digitalisation of education provision and transition to a student-centred e-learning process from traditional classroom instructional processes. As these changes took place in a relatively short period of time, several drawbacks could be identified. As [52] identified, several factors influence the quality of online or hybrid teaching–learning processes: the level of training that teachers have in using technology, their teaching style, interaction with students and strategies used to capture students' attention. According to [53], challenges related to online and/or hybrid instructional processes can take several directions as challenges related to instructors: transition to online from offline, communication barriers innate in online teaching, preparation and teaching style. Challenges related to students include readiness, technical skills to learn online, network and speed issues, identity, interaction and participation. Most importantly, the challenges related to content include development of new material, multimedia tools (videos, PPT, and anima-

tion), regular assignments, checking assignments and regular feedback from students. All these factors have directly influenced the progress or regress of graduate attributes during the pandemic.

Siddiquei et al. [54] confirm the issues that arose during COVID-19 with similar findings and, according to them, online classes during COVID-19 are not very effective because students are not familiar with digitalisation. In parallel, students are not motivated for online classes because of their sudden shift toward virtualisation, and online classes could not replace the social needs of learners and instructors. A study based on undergraduate students enrolled at the School of Educational Science at the University of Jordan reported issues related to financial difficulties, internet connectivity, e-learning platform services, hardware and software availability, mental health, motivation, focus, time management skills, technological skills, technical orientation and guidance, technophobia, isolation, instructors' interaction, teaching strategy and learning material quality [55]. The authors of [56] also highlight the assessment of students' progress during the period as one of the key issues in online classes. Virtual evaluation is a new phenomenon in the university. Before the pandemic, virtual evaluation was not common at university, nor were evaluation infrastructures and processes provided [57]. Therefore, virtual evaluation faced major challenges, as the validity and reliability of its results were sometimes controversial. The authors of [55,56] also highlight the issue of assessment of students' progress during the period as one of the key issues in online classes.

Infrastructural deficiencies and problems were also amongst the challenges mentioned by participants in a research study related to medical sciences. Students reported unsatisfactory experiences with internet speed, uploading information on e-learning systems, downloading the contents and weak support [57]. Similar findings are reported in an observational study of engineering online education during the COVID-19 pandemic, highlighting that not all have equal access to a reliable internet connection. In addition, not having a personal computer/tablet has become a major factor affecting learning outcomes for students [58]. As a whole, the development of graduate attributes through online or hybrid e-learning platforms is challenging due to deficiencies in curricula, teaching styles and teacher and student skill levels in handling digital devices and online tools and in the motivation conveyed by the educational activities.

6. Conclusions

Graduate attributes are viewed as the process representing an achievement in higher education by the acquisition of a derived set of personal qualities, skills or competencies and values separate to the discipline. This acquired competence helps individuals to face uncertainty, become more employable and deal with unknown futures. This in turn supports participation in community life and contribution to social good. This amorphous optimism is tempered by the practical realities associated with hybrid learning, including the role of academic staff being able and willing to implement such strategies to achieve constructive alignment. Implementation of programmes at an institution-wide level has limitations, and, so, learning activities (some identified below) should be designed with others, including appropriate input from employers. In so doing, they should also aim to have additional ethical content, supporting the identified need to improve awareness of such issues.

Public health disasters such as COVID-19 encouraged innovation and inspired out-of-the-box thinking in educational settings [52]. It is essential to focus on building appropriate infrastructure to support hybrid and blended learning methods in order to provide meaningful and engaging learning experiences to students. To that end, instructors can use a variety of strategies in order to engage students in collaborative activities in hybrid, blended and online classes. These activities include, but are not limited to, role-playing exercises, debate sessions on policy changes, brainstorming sessions, pair-share, team-based case study discussions, and problem-based learning exercises. This type of activity promotes a sense of collaboration and teamwork, which is common in career settings [52]. Providing

more socio-emotional support for students is also needed, since the lack of social support, especially peer support during online instruction in the COVID-19 era, negatively affects the motivation of students.

Educational loss, delayed graduations, cancelled internships and lost job offers are some of the critical issues brought on by the pandemic. Moreover, some students who have been away from face-to-face instruction lack certain learning experiences and practical hands-on skills. This has created an educational gap which will affect everyone and may result in underprepared students [57]. To address this particular issue, institutions can offer short remediation programmes and develop extracurricular activities that would help students to bridge such gaps. Furthermore, higher education institutions need to take necessary steps to reconstruct academic programmes and curricula, incorporating graduate attribute development. This will help support the employability of individuals by identifying skills, levels and aspirations which they and their future employers are familiar with. Moreover, creating multidisciplinary educational environments is also suggested as it enables individuals to work with cross-disciplinary literacy. As a whole, the pandemic era and consequent environmental shift in the medium of learning initially provoked the education sector to adapt to a fully-fledged virtual environment. After three years, there remains a considerable legacy from this initial shift, with many educational programmes now offering a hybrid learning model. This new medium has provided an opportunity for graduates to mould themselves to the emerging employability requirements of industry, which vary with improved technological advancements. This includes developing interpersonal skills, flexibility, adaptability and communication skills, all whilst utilising and synthesising the knowledge absorbed to allow oneself to stand out. A hybrid virtual classroom concept, which has learning aligned to the realities of working life, framed in the context of graduate attributes, has the potential to achieve this, with a greater need than ever before for such reform.

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