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Internationalisation in the Digital Transformation

Key findings of a study on the strategies, drivers, priorities, and challenges of virtual internationalisation at German higher education institutions

ABSTRACT

How are German universities coping with internationalisation in the course of digital transformation? This article addresses this question on the basis of selected findings from the INDISTRA project, funded by the Federal Foreign Office, and survey data from the International Association of Universities (IAU). The COVID-19 pandemic accelerated digital adoption, fostering change in internationalisation practices. Internal drivers include international office leaders and academic leadership, while external factors involve funding agencies like the EU and DAAD. The study highlights increasing roles for IT staff and collaboration between administrative and academic personnel to enhance online delivery and partnerships. Post-pandemic, digital tool usage declined, but strategic focus shifted towards Internationalisation of the Curriculum (IoC) and Internationalisation at Home (IaH), emphasising inclusion and widening participation. Blended Intensive Programmes (BIPs) merge online and face-to-face exchanges, appealing to both sceptics and enthusiasts. Digitalisation offers potential but requires strategic integration, organisational support, digital literacy, and a holistic approach that promotes access, inclusion, diversity, and sustainable outcomes.

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Introduction

The internationalisation of higher education institutions (HEIs) has evolved to a central tenet of institutional strategy in a globalised and interconnected world. Internationalisation encompasses a spectrum of activities, including student and staff mobility, collaborative research initiatives, curriculum development, and the establishment of partnerships with institutions across borders. Digitalisation, encompassing the adoption of digital

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tools, platforms, and processes, is transforming how education is delivered, research is conducted, and administrative operations are managed. The integration of technology into education holds the promise of increased accessibility, enhanced engagement, personalised learning experiences, and more efficient institutional processes. The imperative to address this intersection has been heightened by the unprecedented circumstances of the COVID-19 pandemic. The pandemic served as a catalyst, forcing HEIs to rapidly adopt digital solutions to maintain continuity of operations and sustain international engagement when physical mobility was severely restricted. This enforced experimentation has prompted a re-evaluation of traditional internationalisation models and a growing recognition of the potential for digital technologies to enhance and expand the scope of internationalisation activities.

This research brief presents the main findings of a recent report (Vögtle et al., 2025) focusing on the comparison of selected results from two sources: (quantitative) survey data from the 6th Global Survey of the International Association of Universities (IAU) and (qualitative) interview data from the research project 'Internationalisation in the Digital Transformation: Strategies of the German Higher Education Institutions' (INDISTRA) conducted by the German Centre for Higher Education Research and Science Studies (DZHW). While the report mentioned above also contains a comparison with data for other European countries, this research brief focuses on the results pertaining only to German HEIs while exploring in greater depth the topics within the IAU survey that pertain to virtual internationalisation. We matched themes identified in the INDISTRA interviews with selected questions from the 6th IAU Global Survey, where the INDISTRA material could provide additional insights, complementary explanations, or alternative perspectives.

The central premise of this paper is that strategic digitalisation can significantly enhance the effectiveness and impact of internationalisation efforts in German HEIs. However, this potential can only be realised if institutions adopt a comprehensive and holistic approach that addresses the multifaceted challenges and opportunities presented by the digital age. A piecemeal or reactive approach to digitalisation is unlikely to yield the desired outcomes and may even exacerbate existing inequalities within the higher education system.

This research brief aims to provide a nuanced and evidence-based understanding of the drivers, priorities, and obstacles that shape the digitalisation of internationalisation within the context of German HEIs. While some of the drivers include institutional goals, stakeholder expectations, and external funding opportunities, specific priorities encompass student mobility, curriculum development, research collaboration, or institutional partnerships. Additionally, the challenges that HEIs encounter as they navigate the complexities of digital integration include regulatory hurdles, funding constraints, technological limitations, and resistance to change among faculty and staff.

About the studies selected for the comparative analysis

The 6th IAU Global Survey

Since 2003, the IAU conducts global surveys to assess the internationalisation of higher education. The 6th edition, carried out in 2023, focuses on understanding the current landscape, recent changes, and future developments in internationalisation from an institutional perspective. Between January and June 2023, an online questionnaire available in English, French, and Spanish gathered responses from 722 HEIs across 110 countries. The methodology followed previous surveys, particularly the 4th and 5th editions.

The survey, distributed via email to 20,903 HEIs listed in IAU's World Higher Education Database allowed only one response per institution after internal consultations to ensure an institutional viewpoint. Responses pertained to the academic year starting in 2021. The final analysis was conducted throughout 2023, with the report published in early 2024. Feedback from multiple consultations with an Advisory Committee enhanced the report's development. The primary respondents were deputy heads and international office staff, especially in Germany and Europe.

The INDISTRA project

The INDISTRA project was funded by the DAAD with grants from the Federal Foreign Office and conducted by the DZHW between December 2021 and January 2025. The project focused on the question of how HEIs understand and manage internationalisation in the context of digital developments, examining the associated goals, opportunities, and risks. Its objective was to gain insights into the strategic perspectives of HEIs and the roles of players involved in their implementation.

The study encompassed 24 semi-structured expert interviews with heads of international offices (IOs) at public German HEIs. The sample consisted of eight traditional research universities, eight technical universities, and eight universities of applied sciences. Selection criteria included institution size (student enrolment above or below 20,000), state of digitalisation (advanced or newcomer), and level of internationalisation (advanced or newcomer). The 24 selected HEIs represented eleven German states.

The interviews were conducted virtually and addressed various topics such as the impacts of COVID-19, digitalisation in administration and teaching, and challenges associated with virtual internationalisation. The F4X tool was used for transcription, ensuring quality through proofreading against recordings. Data analysis employed thematic analysis, providing a comprehensive understanding of strategic planning in internationalisation and digitalisation within the HEIs studied, using MaxQDA.

Core results and discussion

Impact of virtual internationalisation on HEIs' internal workings and procedures

The COVID-19 pandemic presented a moment of opportunity, pushing change processes in virtual internationalisation (VI) faster and further. HEIs which had already kick-started the introduction of information and communication technology (ICT) to support internationalisation processes prior to the crisis experienced a distinct competitive advantage. Concerning the key internal drivers of internationalisation, the analysis of the INDISTRA interviews and the 6th IAU Global Survey data indicates that the IO heads and academic leadership are perceived as pivotal in driving both internationalisation and VI processes. The IAU survey findings reveal that the three most important institutional key internal drivers of internationalisation are the IOs, the deputy university head and the university head.

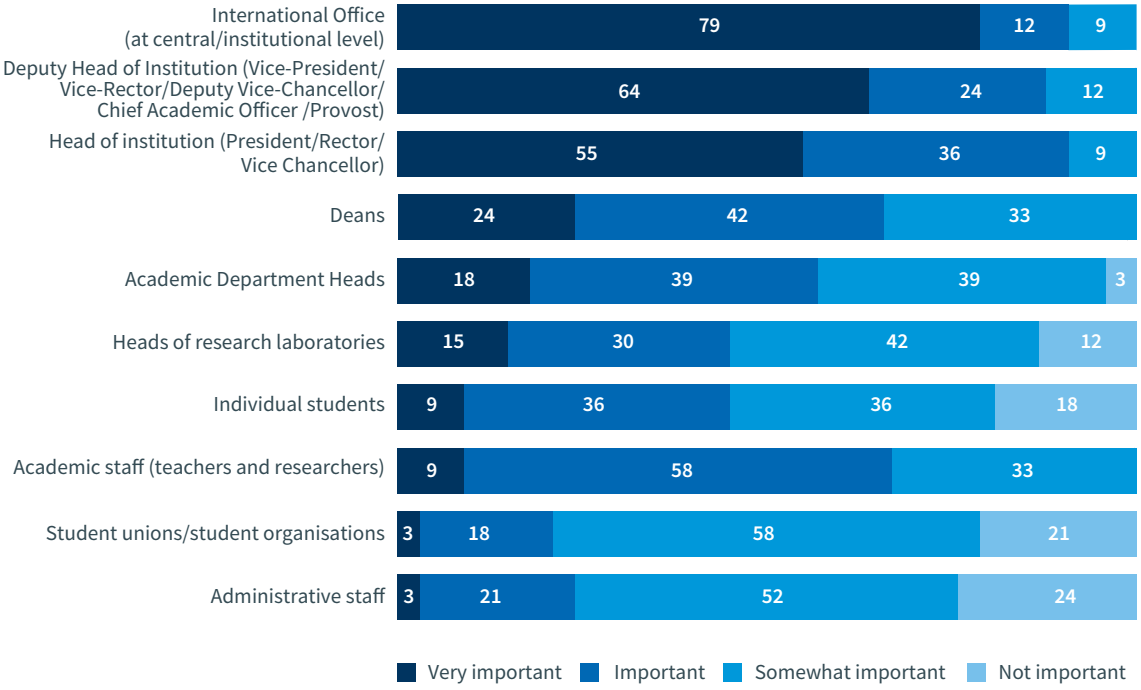
Furthermore, despite a declining use of digital tools and platforms after the pandemic, there has been a noticeable openness to changing processes, seen in the overall adoption of digital technologies, especially in the administration, compared to the pre-pandemic period. After the emergency phase ended, HEIs have been attempting to adjust to the options that best fit their needs, which signals a clear intention to benefit from the lessons learned during this time. As a result of this, digitalisation strategies are in the process of being integrated into internationalisation strategies as a transversal

TABLE 1 INDISTRA SAMPLE SELECTION CRITERIA AND FINAL SAMPLE

HEI type and size	Digitalisation		Internationalisation	
	Advanced	Newcomer	Advanced	Newcomer
Large Universities	U1-1	U1-2	U1-3	U1-4
Small Universities	U2-1	U2-2	U2-3	U2-4
Large Technical Universities	TU1-1	TU1-2	TU1-3	TU1-4
Small Technical Universities	TU2-1	TU2-2	TU2-3	TU2-4
Large Universities of Applied Sciences	UAS1-1	UAS1-2	UAS1-3	UAS1-4
Small Universities of Applied Sciences	UAS2-1	UAS2-2	UAS2-3	UAS2-4

Large: ≥ 20,000 students; Small: < 20,000 students

FIGURE 1 MOST IMPORTANT INSTITUTIONAL KEY INTERNAL DRIVERS OF INTERNATIONALISATION
(in per cent)



topic. The interviewed IO heads expressed that internationalisation can no longer be conceived without digitalisation, emphasising their intrinsic link. Likewise, most interviewees saw the alignment of digitalisation with internationalisation strategies as a cross-sectional issue that necessitates the involvement of all university stakeholders, thereby requiring a comprehensive and institution-wide effort (Bruhn-Zass, 2021).

> *We try to digitalise all our processes, we try to make everything digital so that we can sign digitally, we don't have to use paper anymore. Many of our colleagues also applied for work from home after the pandemic, so we have to find a solution in order to visualise our processes for all of our colleagues online (...). […] So, all the departments in the university are involved in this process and it's a longer process. (UAS2-3)*

A notable development is the increasing importance of IT staff and the need for collaboration between administrative and academic staff, particularly in strengthening online delivery and fostering university partnerships. This supporting and enabling role of administrative staff resonates with recommendations of the German Council of Science and Humanities (Wissenschaftsrat, 2022, p. 65) in that 'the relationship between the academic and the administrative members of the university is of decisive importance for academic performance, especially since the administration fulfils both a service function as well as legitimising and controlling roles'. In sum, the digitalisation of administration has made communication more agile, easier, and transparent, thereby improving interactions not only internally, but also with partner HEIs in Germany and abroad. Consequently, internal networks have become stronger, leading to greater interdependence among stakeholders.

Changes in roles, tasks and work conditions of administrative staff

In line with Trenerry and colleagues (2021), changes in roles, tasks and work conditions of administrative staff have taken place. The INDISTRA interviews show that digitalisation and internationalisation are increasingly viewed as transversal topics, prompting HEIs to rethink and update their strategies. Even in instances where a formal digitalisation strategy is not yet established, there are ongoing efforts and plans to develop a strategy that supports the achievement of internationalisation goals.

> *With the creation of my position, that kind of connection [between internationalisation and digitalisation] became more and more internalised. For the next year, we are waiting for the new digitisation strategy (...) and they are updating it. We try to insert a part in the internationalisation strategy to say, 'In this internationalisation strategy, we have a kind of common-sense regarding digitalisation'. So, we kind of don't consider digitisation projects without the idea of internationalisation. (TU2-1)*

As a result of more holistic approaches, and the aim to fulfil the new competences required for both academic and administrative staff, there have been changes in roles and the creation of specialised positions, such as dedicated personnel to manage platforms such as Erasmus Without Paper (EWP), Mobility Online, and online teaching support units. The roles and responsibilities of professionals in IOs have undergone significant changes. Holding international experiences is no longer sufficient for those working in the IOs (EAIE, 2024). In addition to digital skills and because of the increasing competition for funding, competences such as mastering the process of funding applications and networking with peers to remain informed about opportunities for additional support have become essential.

In recruitment, skills, and training, there are challenges related to staff shortages, high turnover, and competition for qualified IT-staff. The impact of VI on work conditions includes an increased workload and the constant need to update information online to effectively reach target groups. Although remote work offers flexibility, it also requires constant availability. Together with inefficient management practices, this contributes to increased workloads and technostress (Trenerry et al., 2021). Given these conditions, fostering a change of mindset toward technological adoption and readiness has become more critical. Addressing these challenges is closely tied to enabling leadership profiles that drive innovation by promoting stability, clearly communicating strategies and expectations, providing incentives and recognition, and empowering teams with the necessary resources to overcome barriers in adopting digital technologies Cite: (Laufer et al., 2024). In addition, fostering individuals' readiness to incorporate new ICT to their work routines requires 'digital maturity' (Kopp et al, 2019;), that is, organisational openness towards a culture of data-based decision making.

Regulatory and funding challenges of virtual internationalisation

One of the primary challenges in digitalising internationalisation is contending with unclear standards, and a wide array of contradictory rules and regulations, which often require case by case decisions and workarounds. Interviewees highlighted data protection processes — particularly regarding critical partners such as China — as significant concerns linked to ensuring data security and intellectual property protection. Recognition processes are among the grievances of interview partners. Although conversion of grades across different HE systems is an integral component to international student mobility, it remains fraught with bureaucracy, unclear guidelines and lack of standardisation, eventually jeopardising fairness, transparency and trust in HEIs. Additionally, rules and regulations often fail to keep pace with digital advancements, as in the case of the status of students participating in blended mobility programmes. These insights reinforce Knight's (2015, p. 2) claim that, contrary to what is commonly assumed about the benefits of digitalisation and the 'borderless' world it can create, borders remain crucial when regulatory responsibilities – such as quality assurance, funding, and accreditation – are at stake.

INDISTRA results stress that funding agencies constitute the main external drivers of VI. The European Union, the Federal Ministries, and funding agencies such as the DAAD figure as the main funders of

VI, and their support has arguably aided HEIs to respond to the crisis and to develop infrastructures beyond the pandemic. DAAD funded programmes, such as IVAC[1], IMKD[2], and actions within the European Universities Initiative have provided essential support. However, securing funding is a competitive race HEIs need to endure.

> *So now, because it's [digitalisation] one of those things that are trending in internationalisation, there's a lot of money available for your research project, but also for DAAD programmes in the last couple of years (…). So that means it's always limited in time (…). [The] Erasmus now has this blended international programme. (…) I have no idea how long that's gonna last (…). I would say that most of the funding is limited, is project funding (…). The big question is: What happens afterwards when specific funding for digitalisation sort of dries out. Which is definitely going to happen because there's gonna be something else [a new trend] in five years. (UAS1-3)*

Limited external funding, combined with unequal availability of resources across universities, especially in the scope of the so-called universities of excellence (*Exzellenzuniversitäten)* in Germany (Sziegat, 2022) has often prompted HEIs to adopt what has been mentioned by an interview partner as a 'follow-the-money strategy'. In such instances, strategic decisions regarding VI are primarily based upon available funding opportunities. Questions about who provides funding are significant, especially given the notable prevalence of third-party funding sources. While there are various funding schemes available, these are largely project-based and not always sustainable in the long term. Third-party funding from the DAAD and the German Federal Ministry of Education and Science (BMBF) emerges as the principal financing sources for VI activities among HEIs in the sample. While there is a prevailing argument that these project-based, short-term funding schemes hinder the achievement of sustainable strategies, it is also evident that some HEIs have leveraged this expertise to advance their own programmes. Yet, it is essential to shift away from reliance on short-term project funding and towards the establishment of long-term institutional support for VI as this is fundamentally about strategic sustainability, and institutional autonomy (Sziegat, 2022).

Changing internationalisation activities and the driving forces behind these changes

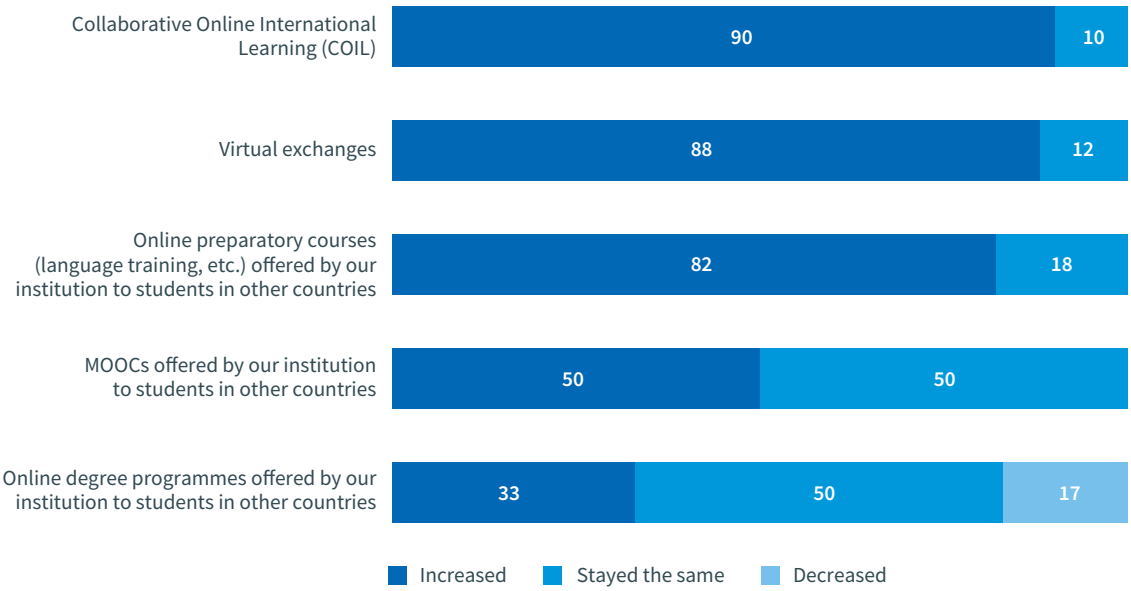
According to the INDISTRA interview material, one outcome of the COVID-19 pandemic induced digitalisation was a shift in focus by HEIs towards Internationalisation of the Curriculum (IoC) and Internationalisation at Home (IaH). As the pandemic unveiled persistent social inequalities, discussion over inclusion and participation came to the fore. This shift included the realisation that international student mobility was by and large an experience granted to a 'mobile elite', and not every student would have the opportunity to experience physical mobility. As physical mobility became unfeasible, and HEIs were compelled to adopt digital formats, a range of possibilities emerged, including the development of virtual exchanges, Collaborative Online International Learning (COIL), digital classrooms, joint courses, guest lectures, and online internships with international partners. Consequently, with the support of ICT, the IoC or IaH resurged as an increasingly prominent goal.

Regarding the importance of VI opportunities, COIL, virtual exchanges and online preparatory courses (language training, etc.) offered to students in other countries are present at the majority of German HEIs and have increased in importance at more than 80% of German HEIs that replied to the survey. On the contrary, only 38% of German HEIs offer massive open online courses (MOOCs) to students in other countries than Germany and

1 International virtual academic collaboration (IVAC) is a programme funded by the DAAD providing practical support to instructors and strategic support to higher education institutions in three calls for application between 2020 and 2023. The aim has been to develop and expand international higher education partnerships and worldwide mobility by tapping digital possibilities (*https://www.daad.de/en/information-services-for-higher-education-institutions/further-information-on-daad-programmes/ivac/*).

2 Between 2020 and 2023, the programme International Mobility and Cooperation through Digitalisation (IMKD) supported German higher education institutions to rethink international partnerships among higher education institutions. The programme promotes the use of digital instruments as tools for their own internationalisation strategies and supports student's international mobility The programme was funded by the Federal Ministry of Education and Research (BMBF), and the funding programme ended in 2023 (*https://www.daad.de/en/information-services-for-higher-education-institutions/further-information-on-daad-programmes/imkd/*).

FIGURE 2 CHANGE IN IMPORTANCE OF VIRTUAL INTERNATIONALISATION OPPORTUNITIES OVER THE LAST FIVE YEARS (in per cent)



even less (23%) offer online degree programmes. MOOCs offered by the institution to students in other countries than Germany have increased in importance only at half of HEIs and remained stable at the other half. Finally, online degree programmes offered by the institution to students in other countries than Germany remained stable at half of HEIs and increased in importance only at 33% of HEIs. (Fig. 2).

In line with the IAU results, INDISTRA Interviews provide evidence that due to the COVID-19 pandemic significant changes in international student mobility took place, reflecting a shift in mindset that recognises internationalisation as extending beyond physical mobility. Whereas physical mobility continues to be relevant and the preferred format among those who do not encounter barriers to participation (e.g. financial, physical impairments, care responsibilities), there is growing acceptance of virtual internationalisation programmes, seen as pathways to future mobility experiences or as complements (O'Dowd, 2022) rather than alternatives to traditional mobility formats. Nonetheless, perspectives on fully online programmes remain varied, and the implementation of hybrid formats deemed particularly daunting for academics.

Blended Intensive Programmes (BIPs) have emerged as a key initiative in this area, advancing the blended mobility concept as part of the new version of the Erasmus+ programme, featuring more digital, environmentally sustainable and inclusive mobility and cooperation opportunities. Institutions from the INIDISTRA interview sample were actively using these formats, particularly within the framework of the European Universities Alliances. Although participant numbers were not yet large due to administrative challenges and limited Erasmus+ funding, these programmes have proven popular. However, some interviewees noted that demand remained lower than expected post-pandemic, highlighting the need for a mindset shift and increased financial support for them to become mainstream. By combining online exchanges with short periods abroad, these programmes seem to have achieved a middle ground between digitalisation sceptics, who feel virtual internationalisation opportunities lack the comprehensive international and intercultural experiences of physical mobility, and digitalisation enthusiasts, who advocate for more eco-friendly, flexible, and inclusive mobility options.

> *I think it's more inclusive. We can reach students who, for whatever reason, can't go abroad or who can't come to us from abroad. It also can serve as an 'appetiser' for undertaking a semester abroad, or an internship abroad later because you've had some international experience, or, for example, if you're in a digital classroom with one of our partner institutions (…), then you've already made contact and you kind of know how they work, and that might sink [lower] the threshold for going abroad. I think those are two of the main benefits. And, of course, I think all students benefit from having a different perspective brought into the classroom. And with, you know, joint digital classroom projects both cohorts of students benefit because they're getting an international perspective from the teaching side of things. (U1-2)*

Aligned with broader European Union directives, social and environmental responsibility is clearly a driving force of VI strategies. Participants have voiced concerns over the environmental consequences of international travel and trust that changing patterns of international mobility can effectively minimise these detrimental effects. In this context, they called for a more critical engagement with physical mobility, combined with efforts to make virtual experiences more attractive and meaningful. Moreover, there is a new consensus that virtual and blended mobility can enhance inclusion and access to international opportunities, offering to both students and staff the added value of developing a set of skills and competences, such as intercultural, collaborative, digital, leadership and transversal skills – deemed as vital to successfully navigate an ever more diverse, mobile and digital world. While, by and large, INDISTRA interviewees advocated for online formats as more inclusive, accessible, and environmentally sustainable, some acknowledged inherent limitations. In one distinctive example, an interviewee stated that student groups participating in digital offers tend to be the same who would typically participate in traditional mobility programmes. This observation mirrors findings in the literature indicating that virtual exchanges are more accessible to certain student demographics and of certain socio-economic backgrounds, while also questioning whether the empirical evidence available is robust enough to support widespread 'inclusion claims' (Whatley et al., 2022). However beneficial, digital opportunities are not equally distributed and, in many cases, barriers stemming from disabilities (Bruhn-Zass, 2021), age, gender, ethnicity, socio-economic and digital capital (Buchmüller et al., 2021, p. 92) remain unabated. Therefore, the potential of virtual exchanges to promote inclusion and equity cannot be taken for granted (Whatley et al., 2022). Virtual spaces are not neutral and addressing the roots of inequality and exclusion should remain a concern also in these settings. It is paramount that leveraging the integration of ICT into internationalisation processes go hand in hand with institutional commitment to enable digital equity and to tackle 'the complex ontological, epistemological, ethical, and identity issues arising from teaching, learning, and living in the digital age' (Buchmüller et al., 2021, p. 92).

Impact of digitalisation on international networks and partnerships

When it comes to HEI collaboration, digitalisation has improved communication with partners and strengthened existing partnerships. There is a focus on bottom-up collaborations, highlighting the role of academics as key players in internationalisation efforts.

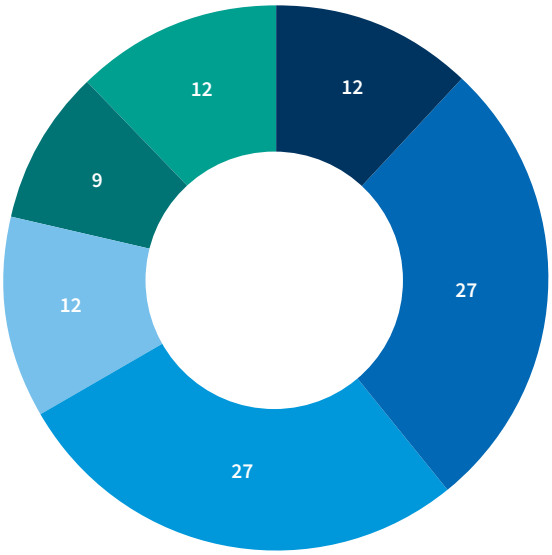
> *One [benefit] is definitely the way to start and further develop a cooperation, especially when you want to involve the scientists. So, this matchmaking process has improved a lot with digital means. And this collaborative work in between physical meetings of partners and networks has also improved a lot. (TU1-4)*

Consistent with evidence that peer networks can positively influence attitudes towards technological adoption (Trenerry et al., 2021), numerous accounts highlight the significance of information exchange with partner HEIs, both within Germany and internationally, as key drivers of VI strategies. This observation underscores the invaluable role of collaboration through both informal channels, such as individual colleagues from IOs, and formal networks, particularly in the context of the European Universities Initiative. Cooperation within the European Universities Initiative is associated with competitive advantages and the enhancement of digital infrastructures has frequently been cited as a source of knowledge and innovation in the internationalisation of higher education.

Additionally, geopolitical considerations have shaped HEI collaboration and placed significant challenges to these endeavours. In Germany, this has been expressed in growing scepticism and eroding trust, accompanied by institutional measures targeted at critical partners such as China, Russia, and Iran, with the intent to safeguard national interests, security and uphold academic integrity. This new realisation has also been accompanied by the recognition that 'Germany needs a more strategic approach that reconciles the great good of academic freedom with security policy interests in international cooperation' (BMBF, 2024). This new stance entails a reassessment of the risks, opportunities and limits of scientific collaboration strategies – also against the backdrop of growing digitalisation – without sacrificing the collective benefits that continued collaboration with partners, such as China, can yield (DAAD, 2024).

The 6th IAU Global Survey contained a question on the effect of changes in political relations between countries on internationalisation of research. However, the analysis of the results of this question in Germany is difficult and might reveal a possible misinterpretation of the question and the presence of subjective and not factual replies. In fact, 9% of German HEIs replied that their institutions were required to completely suspend research partnerships with institutions in some countries because of newly introduced governmental rules and regulations, while 27% reported that their institutions were required to revise their research partnerships in some specific disciplines with institutions in some countries because of newly introduced governmental rules and regulations. 12% of HEIs replied that their international research was not affected by changed political relations. (Fig. 3)

FIGURE 3 EFFECT OF CHANGES IN POLITICAL RELATIONS BETWEEN COUNTRIES ON INTERNATIONALISATION OF RESEARCH (in per cent)



- Our international research was not affected by changed political relations
- Our institution was required to revise its research partnerships in some specific disciplines with institutions in some countries because of newly introduced governmental rules and regulations
- Our institution chose to revise its research partnerships in some specific disciplines with institutions in some countries because of its own decision
- Our institution chose to revise its research partnerships in all disciplines with institutions in some countries because of its own decision
- Our institution was required to completely suspend research partnerships with institutions in some countries because of newly introduced governmental rules and regulations
- Our institution chose to completely suspend research partnerships with institutions in some countries because of its own decision

This resonates with the view that given the extent and complexity of higher educations' international engagement over the past five decades, HEIs can no longer sidestep these developments, however controversial and nuanced the current scenario presents itself (Wit & Altbach, 2024). The authors add that while simple solutions are not easy, HEIs are central in steering open and continued dialogue involving the whole academic community domestically and abroad, sustained on academic freedom, autonomy, participation, academic integrity and social responsibility. 'Such a debate needs to be the basis of their international academic relations and the lens through which to assess existing partnerships, which may or may not result in freezing existing institutional relations' (Ibid, p.4).

Conclusion

In international literature, opinions on the systematic integration of digital solutions to internationalisation processes vary. Some scholars argue that German HEIs have not fully capitalised on the digital structures and process changes brought about by the COVID-19 pandemic (Bedenlier & Stöter, 2022) and question whether this will lead to the systematic integration of educational technologies by HEIs. Conversely, a 2023 global pilot study by IAU found that, despite a partial reduction in the use of ICT following the pandemic, HEIs continue to benefit from the digital transformation and enhanced digital competences developed during the emergency response (IAU, 2023).

Taken together, our findings suggest that digitalisation has great potential to promote internationalisation of teaching and learning, collaboration and administration processes. Despite observations of a pushback in the use of digital tools following the pandemic, the inherent flexibility of digital formats is gradually intertwining the processes of digitalisation and internationalisation. This interplay has made internationalisation of HEI more accessible, inclusive, environmentally sustainable, and culturally diverse. Even though international experiences are generally regarded as more meaningful through traditional physical mobility, blended intensive programs are gaining sway among HEIs as a middle-ground alternative that breaks away from the 'virtual *vs* physical' divide. While digital and blended formats can arguably facilitate access to international learning opportunities for more diverse student and staff profiles, various barriers continue to limit participation, even in digital settings. Thus, we maintain that, in addition to these barriers, oversimplified 'inclusion claims' need closer scrutiny. Concerns have been voiced regarding the reduction of funding for personnel, as high expectations associated with digital technologies tend to be based on an underestimation of the resource-intensive nature of digitalisation. This over-reliance on the perceived potentials of digitalisation alone can lead to the neglect of financial and human resources needs.

For further advances on the teaching side, measures must be paired with organisational support and incentives for academics to engage with digital teaching. For students, it does not suffice to be a "digital native"; they need to be trained to attain digital literacy to be equipped with the tools they need to navigate the complexities of global learning. In this context, digital literacy may allow students to conduct research on international challenges, participate in virtual exchange programmes, and engage with peer networks from around the world. It also enables them to critically assess information sources, discerning credible data from misinformation, which is crucial when addressing global issues that are often subject to debate and controversy. The synergy between global learning and digital literacy is essential for higher education students, as it prepares them for an interconnected world where digital tools are indispensable for understanding and tackling global issues. It should thus become an integral part of the higher education curriculum.

This can be connected to the current discussions about artificial intelligence (AI) in higher education. A systematic review article by Crompton and Burke (2023) found that most studies on the topic concentrate on undergraduate students, with a predominant focus on language learning and applications including assessment, prediction, AI assistants, intelligent tutoring systems, and student learning management. They come to conclude that the rapid evolution of AI technologies, such as ChatGPT, highlights the need for continuous exploration of their implications within the educational landscape, emphasising that certain geographic areas remain

underrepresented and warrant further investigation to fully realise potential benefits (Crompton & Burke, 2023). We would not be surprised that again, as mentioned above, there might be an over-reliance on the perceived potentials of AI in higher education, neglecting financial and human resources needed to adequately implement and operate it.

Overall, the strategic orientation of digitalisation as a comprehensive institutional project has a positive impact. At various HEIs, digitalisation is pursued as a broad initiative, influencing all aspects of administration and, to some extent, science communication and teaching. This is evident in references to resource availability and allocation, the potential for internal collaboration and synergies, and a unified framework with coordinated use of tools and platforms. In line with the concept of Comprehensive Internationalisation (Hudzik, 2011), our findings corroborate with the view that comprehensive digitalisation is a sustainable method for digitalising higher education, including VI (Bruhn-Zass, 2021). However, digitalisation should be a means to an end. Challenging the notion of digital techno-determinism and the status of technology as a 'virtually autonomous agent of change' (Elish & boyd, 2018), INDISTRA interviewees emphasised that digitalisation should not be seen as a panacea. Instead of being an end in itself, VI needs to have added value by catering for specific needs and translating into improved human experiences.

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