DAAD Deutscher Akademischer Austauschdienst
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d·i·e Deutsches Institut für Entwicklungspolitik
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# Digital Transformation:
# Higher Education and Research for Sustainable Development
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# Experts' Position Paper

Bonn,
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**Acknowledgements**

This paper compiles the results of an experts' workshop in Bonn on 8 and 9 November 2018. The workshop was jointly organised by the DAAD and DIE, bringing together the spheres of education and research on sustainability with experts from around the globe. Four input papers have instructed our discussions, specifically input by:

-Shreyasi Singh on Indian experiences (as an example of a southern power),
-Johan van Niekerk on African experiences,
-Dominic Orr on industrialised countries, and
-Barbara Moser-Mercer on digitalisation in fragile contexts.

This paper – compiled by Sven Grimm (DIE) with Michael Hörig and Tobias Wolf (both DAAD) – thus explores some key aspects of digital transformation in the areas of knowledge for sustainable development, research, and higher education, and includes a view on international cooperation. It is based on these input papers, for which we are grateful, and deliberations during our seminar. It was circulated among all participants; all inaccurate or incomplete statements, however, remain the sole responsibility of the authors of this paper.

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*Please also refer to:*

*The DIE Special Website: https://www.die-gdi.de/en/digitalisierung/*

*The DIES website: https://www.daad.de/dies/en/*

## Digitalisation and sustainable development

Digitalisation impacts all spheres of our lives – privately, at work and our relations with one another, also through institutions. It is figuratively making the world "spin faster". Digital transformation means profound changes in "all sectors of our economy, government and society based on the large-scale adoption of existing and emerging digital technologies"[i]. Digitalisation opens rich opportunities for higher education and research – albeit with various challenges across the globe. The future is often already here, but not everywhere. New opportunities arise as well as new risks, and these trigger some scepticism.

Sustaining the basis for human life on our planet requires fundamental changes in the way we live, engaging with each other and respecting ecological limits. The Agenda 2030 covers social, economic and environmental dimensions of development. Digitalisation could help in managing this process.

The Agenda's comprehensiveness and the interlinking of the different Sustainable Development Goals (SDGs) require new knowledge and more intensive cooperation and exchange among the many traditional academic disciplines. The 2030 Agenda for Sustainable Development refers to ICTs as having the potential to accelerate the progress of development, bridge digital gaps and construct knowledge communities.[ii] Education, including higher education, plays a special role in enabling these benefits. SDG 4 in particular sets forth a framework with key principles for education: inclusiveness, equity, quality and lifelong learning.

Future growth is expected to rely on increasing the value added through additional services. This will shift previously human-based work to computers, which are more reliable in routine and large-scale data processing. It will also lead to people's jobs consisting of a higher proportion of non-routine, creative and communicative tasks, with the human skill for empathy being an important factor. Moreover, the continuous and ever faster cycle of innovation and change will lead to bumpy career pathways and personal uncertainties for the population, requiring frequent periods of reorientation and retraining.

Academia's mission is to contribute to society for the common good. Higher education and research play a role in both, ensuring access to higher quality learning for all and providing new knowledge and promoting new forms of exchange on the grand challenges affecting our interconnected world. They also play a role in their respective societies as incubators for innovation. Knowledge needs to be processed and communicated to target groups to ensure its dissemination in society. Learners in higher education, for their part, are "prosumers" - i.e. both producers and consumers[iii] – of knowledge and need to be enabled to this role.

## 1. Knowledge for sustainable development

The perspective of "grand challenges" is itself a challenge to science, which is typically organised along disciplinary lines. The Internet and digital networks are the means of connecting disparate information and are changing how society is organised and operates. Therefore, it is not so much the technology but the nature of the communities involved that allows processes to be organised differently[iv].

Four innovation trends made possible through digitalisation can be identified: business activities, faster and cheaper business experimentation, widespread and easier sharing of ideas, and the ability to replicate innovations with greater speed.[v] Knowledge-based processes in science can also be improved through these opportunities, which make the sharing of knowledge and the sharing of

experienced, personalised services and support feasible on this scale[vi]. Additionally, through digital storage, knowledge becomes available to society.

All of these changes, including regulation of access and use, require societies' discussion and agreement. These points also require that the research community consider ethical issues so as not to undermine civic freedom and self-determination. The goal should be to foster the common good and work against manipulation (of data itself and its skewed interpretation).

For researchers, the wealth of potentially available information is increasing at a tremendous pace. The quality of knowledge can be improved through the availability of resources, including access to data and academic papers. Nonetheless, problems remain. Many papers and much data are available to limited audiences or are costly for researchers. Yet the access and processing of this information does not happen automatically. It requires the right questions and political action. The main question is social and global equity: how to ensure that all people and all nations of the globe benefit from digitalisation.

## 2. International cooperation

Digitalisation changes the way we interact – as researchers, higher education institutions and societies as a whole. Innovation and progress are found across the globe. The topic of digitalisation itself – the opportunities it opens and the challenges it poses for societies and individuals – is a topic for exchange on equal footing, as all societies face this transformation.

This opens new opportunities for international cooperation among institutions from different countries and their faculties. Indeed, we find indicators for this type of interaction increasing: authorship of publications can become more global and thus knowledge can be created and disseminated across previously limited national and epistemic (disciplinary) communities. Also, researchers and learners around the world can gain access to and participate in global debates.

Digitalisation allows for exposure to more diversity. New networks are formed that use and drive the process of knowledge sharing. Use of technology can thus foster interdisciplinary work that allows us to integrate ideas and knowledge across intellectual silos – and across borders.

Digitalisation offers more and/or better platforms for engagement. However, these are not sufficient in and of themselves. Technology has integrated us into our own small "cultural zones" – even cross-border – where people with similar interests come together, but we may find it difficult to get along with people from different backgrounds or with different perspectives. Digitalisation cannot be a substitute for direct communication among people. It could, however, make a significant contribution to lessening the need for physical mobility through digital platforms that allow for virtual preparatory meetings, supportive blended-learning elements and digital follow-up phases.

## 3. Higher education and digital learning

Technology has changed our societies. It has become the core of people's reading, writing, computing and thinking, which is the main challenge for our education system. Digitalisation is a reality for higher education and research, driven by the expectations of learners and opportunities for cooperation.

Learning is always an individual process. Digitalisation offers the possibility of expanding its scope and acquiring new audiences, and it can add safe spaces of freedom to some communities. Yet, digital scope and new ways of learning will not necessarily reduce costs, as substantial investments in

infrastructure and a skilled teaching staff are also necessary components. In some contexts, digital learning through measures such as Massive Online Open Courses (MOOCs) might be an improvement over existing standards; but this requires funding to train personnel, invest in didactics, design courses, and measure outcomes (learners' success).

Higher education's role is not job training but job enablement. In addition to focusing on the use of technology, higher education plays a key role in ensuring digital literacy. As information becomes available in international networks, rote learning loses importance. The focus is transferred to teaching people how to find information, how to recognise when more information is needed, and how to evaluate the quality of the information that they have found. Life-long learning, as the ability to embrace technological change, should be at the heart of all education irrespective of the context for which it is designed.

The real opportunity and challenge are about increasing the reach of education while ensuring quality. Digitalisation allows for more flexibility and self-responsibility in choosing learning content, which opens the possibility of creating personalised learning paths. Learning content is available 24/7, which adds flexibility to learning. In order to live up to this potential, new tools require a new outlook on didactics. The computer environment can adapt to the individual student's level of ability and help all students succeed. Technology-supported learning can also increase reach in a variety of settlements, including refugee camps and refugee-hosting communities, which would not otherwise have access to higher education. Higher education and research need to embrace these opportunities proactively, and international cooperation in and on research needs to address the challenges of digitalisation in order "to leave no one behind".

In order to ensure understanding and critical engagement with learning content, quality digital programmes must provide comprehensive academic support as well as psychosocial support. They should always include a face-to-face component, which can be implemented offline (blended learning) or online (digital classrooms).

## 4. Recommendations

***Policymakers and decision makers in higher education institutions need to embrace and shape digitalisation.*** Policies, plans and strategies are needed to shape digitalisation for the common good. New challenges and risks must be managed through active policy engagement. Policymakers are encouraged to invest in higher education globally. Only a very limited share of funding is currently earmarked for strengthening higher education systems, which face many challenges – including digitalisation. Sharing infrastructure, physical space, and personnel to the greatest extent possible allows for cost-effective cooperation, but people-centred digitalisation requires investment. The investment needs to include capacity building in refugee-hosting countries to strengthen higher education systems, as this can better ensure quality education for their populations and enable them to be drivers of development.

## International research networks and cooperation should…

Invest in the communication of research results, their implications and limitations. The complexity of these challenges to humankind and the need for transformation require intensive communication. New technological reach in communication is not solely limited to evidence-based communication. On the contrary, personal uncertainty and (the sense of) exclusion within society and globally provide a

fertile ground for manipulation with ulterior motives. Academia must live up to its role and contribute to improving the digital maturity of individuals and society.

***Make publications and learning material open access.*** Publishing incurs costs that have to be retained through other means, which results in additional costs in the financing of a project when "the last mile" – bringing the results to the addressees – is included in the funding scheme. However, privatisation of data and exclusion of less affluent researchers are high risks for the research community – and for global innovation overall – as research depends on "the best minds" being applied to problem solving. Similarly, the openness of learning material is important in order to update and/or adequately embed content in the respective context.

***Seize the opportunity of cooperation.*** Digitalisation substantially fosters an interconnected world; research and development must be intensified across national borders in this context. The more complex the connection between countries, the more opportunities for countries, firms and researchers to learn from each other and improve their own products, processes and practices.

***Strengthen diversity of perspectives to ensure impact.*** The current status quo of research collaboration is still dominated by high-income countries. However, it is clear that the grand challenges require international collaboration, which is not limited to researchers from countries with similar economic and technological infrastructures. This might require additional funding for research; it certainly requires international access to the exchanges of ideas, including joint research.

## Higher education institutions should…

***Reflect on and react to developments in society in their study programmes.*** Higher education institutions should be a place to consider and even practise future social reform, which can truly harness the benefits of digitalisation for all. Support from leadership is crucial in this endeavour. Higher education institutions must define the role they want to play in lifelong learning. Furthermore, both formal and informal modes of learning will become more fluid; academic teaching needs to position itself in this new context.

***Invest in infrastructure for digitalisation***. Required are investments in equipment in university libraries to ensure sufficient bandwidth, working stations and free access for students and staff. In addition, resources must be allocated and this includes resources for the management of these infrastructures, e.g. with regard to cyber security and data security.

***Focus (again) on the cultivation of the human spirit and foster global citizenship***. Some key skills remain the same – or become even more important, as they distinguish humans from machines: responsibility, awareness and innovation. Analytical and critical thinking are key in order to not only be able to use, but also to *make use* of technology for the common good and address major challenges. Machines are better suited to conducting repetitive tasks and processing large quantities of data, but ethical considerations are unique to humans.

***Harness the potential of digitalisation for creating new learning spaces in order to improve the accessibility and quality of education***. Online education potentially provides everyone with access to the best teachers and the best content through technology. However, fostering comprehension requires didactics – even in digital learning. This in turn requires teaching skills and training. The

creation and use of digital learning content makes the further training of university lecturers more important than ever, but it also requires designers who specialise in online teaching content.

***Include local experts and knowledge to contextualise digital content.*** Digitalisation and ubiquitously available information have not changed the fact that information becomes knowledge only when applicable in the respective context. This includes, but is not limited to, the learner's language.

***Ensure trust in digital education products through quality management.*** Measures to ensure the quality of digital education products are needed[vii]. Some of the standards require trustworthy accreditation procedures so that learning that has taken place elsewhere (including in digital spaces) is recognised. Trust that the learning formats on offer foster comprehension and that the acquired knowledge is applicable is needed. This is a requirement of both learners and future employers.

***Support pioneers in digitalisation***. A cost-effective way would be to support pioneers and provide training for trainers in new high-quality learning formats. A challenge is funding for high quality online teaching when it comes on a project basis only, as knowledge needs to be institutionalised in order to retain it.

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