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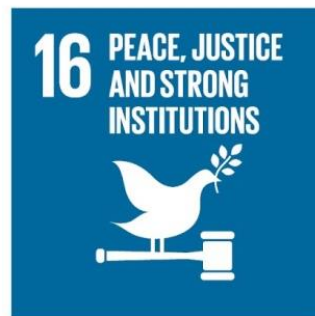
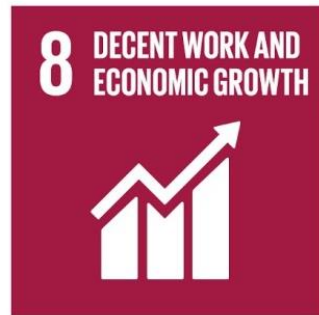
Accelerating Achievement of Sustainable Development Goals through ICTs: a UNESCO perspective

Jonathan Baker

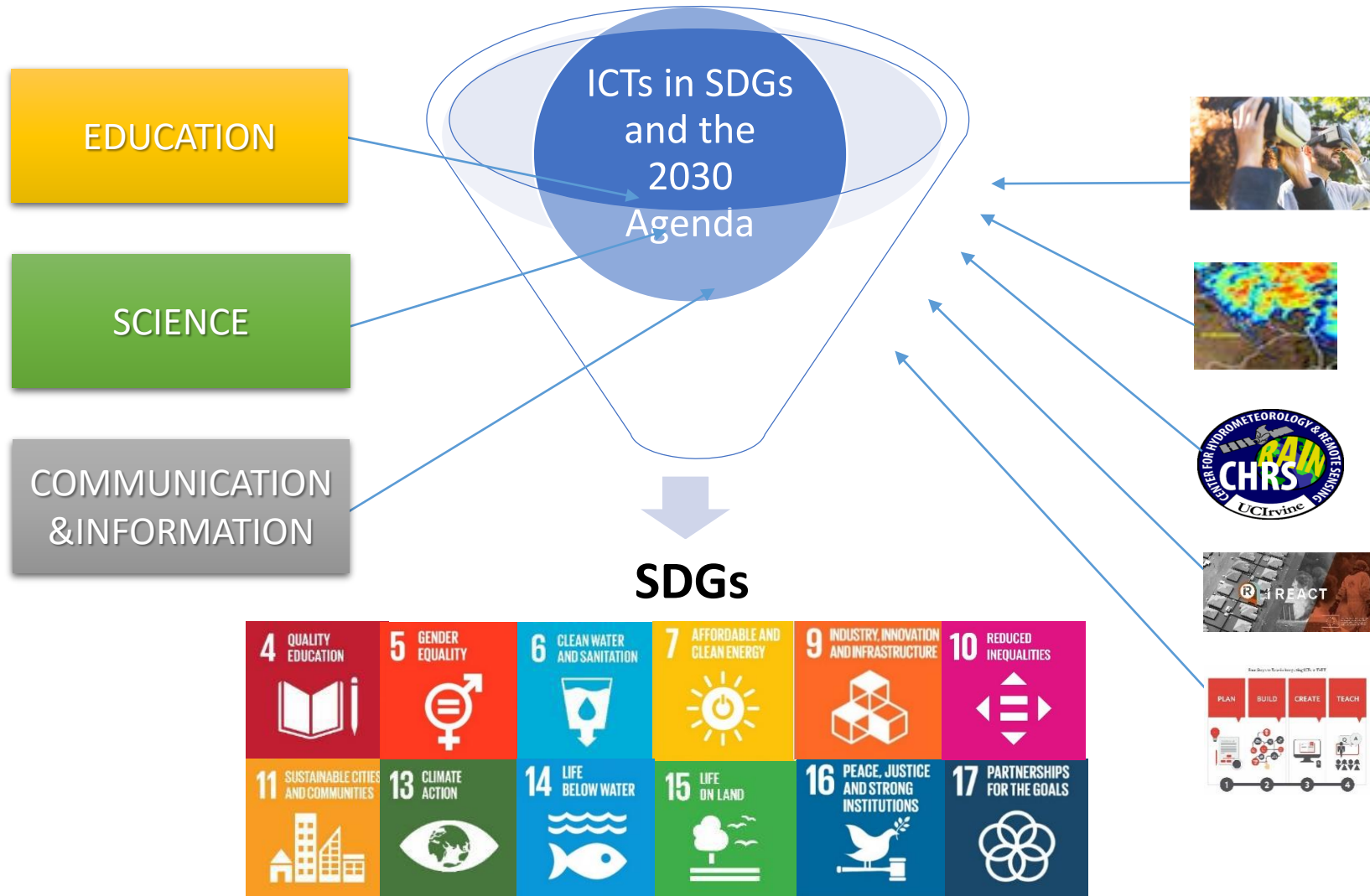
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The 2030 Agenda for Sustainable Development



UNESCO works with ICTs to contribute to SDGs



Customized programmes or routes and education packages based on AI-driven data mining and analysis of visitor behaviour

IHP-supported G-WADI's Precipitation Estimates in their Daily Flood Bulletin

Rainmapper A New Mobile Device Application for Real-time Global Precipitation Monitoring

EU funded I-REACT project using a kit of new technological tools to reduce risks linked to natural disasters

Developing digital skills from K-12 students to TVET education



ICTs for Education

UNESCO, together with other partners, will have the duty to provide support in building local capacities in developing and deploying relevant ICT solutions, planning national ICT in education policies and strategies, and monitoring and evaluating the impact of ICT for **achieving SDG 4**.



ICTs in SDG4

Target 4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and **information and communications technology**, technical, engineering and scientific programmes, in developed countries and other developing countries.

Indicator 4.4.1 Proportion of youth and adults with **information and communications technology (ICT)** skills, by type of skill.



QINGDAO STATEMENT 2017

- ✓ It is the main document regarding leveraging ICTs to achieve education 2030.
- ✓ It reaffirms the importance of national strategies for the inclusion of disadvantaged people in the use of ICTs towards SDG 4.
- ✓ The plans should be school based: teacher training and professional development are the first step, since, within few years, they will include ICTs in their pedagogy.
- ✓ To make sustainable use of ICT for SDG 4, governments and institutions are called on to shift from relying on a device-shipment approach to fostering the evolution of locally sustained ICT solutions through giving local communities agency in the process of developing technologies and digital content that meets their needs.



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Leveraging ICT to Achieve Education 2030

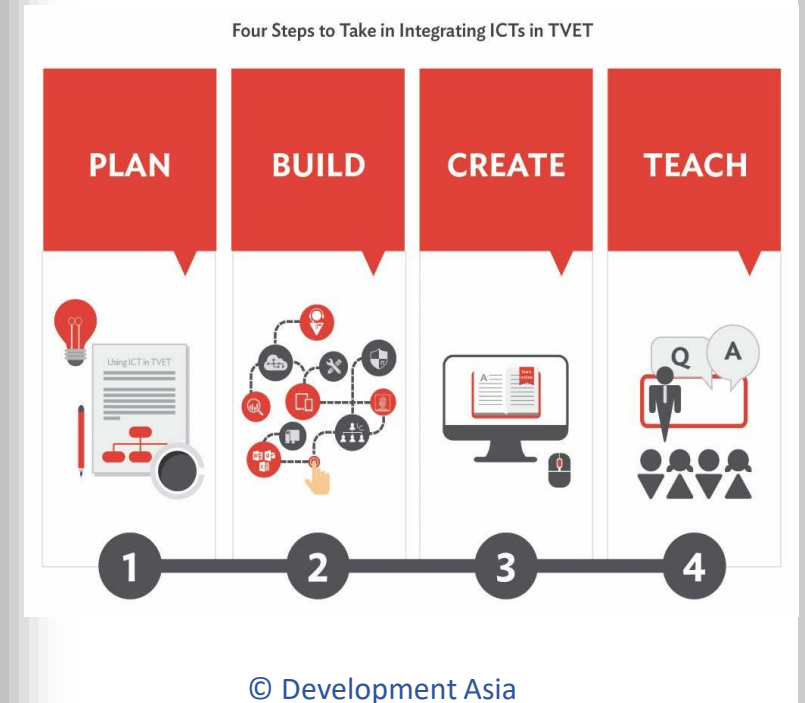
Leveraging ICT to Achieve Education 2030, the **UNESCO-Weidong Group Funds-in-Trust Project**, is a 4-year project that helps Member States harness the potentials of ICT to achieve SDG 4 by 2030.

The project aims to:

- ✓ *Convene global debate and enhance knowledge sharing among policy makers about the ways ICT can be leveraged at scale to support the implementation of SDG 4;*
- ✓ *Help Member States develop national policies, master plans and strategies on ICT in education;*
- ✓ *Formulate partnerships and support national flagship projects on leveraging ICT for SDG 4;*
- ✓ *Strengthen teachers' capacity-building on ICT in education, and empower women and girls through joint activities with other UNESCO Fund-in-Trust projects;*
- ✓ *Document and disseminate best practices to harness ICT for education with a particular focus on digital innovations.*

Developing digital skills from K-12 students to TVET education

- ✓ In Norway, the national framework for digital skills has been developed to improve students' digital competence.
- ✓ The Norwegian approach is to integrate digital skills within subjects rather than teaching them as isolated skills.
- ✓ ICT in TVET education has been seen as a tool for learning, a specialized field of experiences, and a tool to improve access and quality to bridge schools and workplaces.
- ✓ Several ICT innovations, such as virtual reality (VR) and augmented reality (AR) simulation, e-portfolio, and flipped learning with OER, have good potential to transform TVET education for the future.



ICTs for Science

Progress has been fostered in ICTs and their implications for UNESCO's programmes in **natural sciences** in most areas of ecological and biodiversity research, together with environmental and ecosystem management



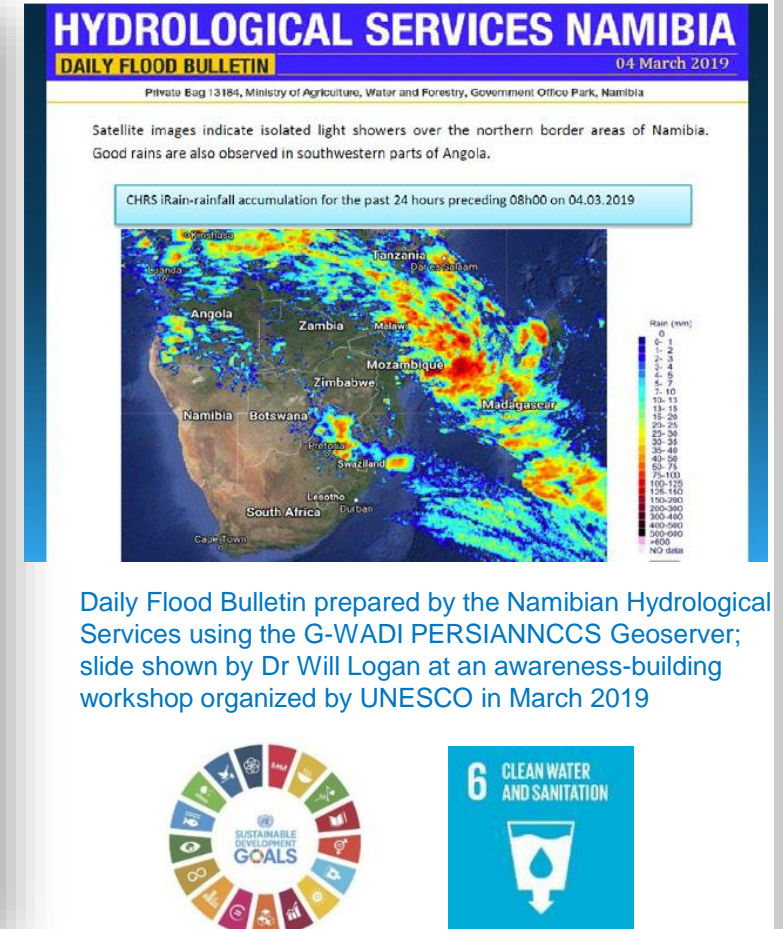
ICTs for freshwater management

- ✓ **UNESCO's own International Hydrological Programme** began developing an application of artificial intelligence in 2005, in partnership with the University of California, Irvine (USA), to inform emergency planning and management of hydrological risks, such as floods, droughts and storms.
- ✓ **Machine learning algorithms and statistical modelling** are increasingly being used in water science (e.g. Serbia) to control the quality of time-series data in structural and environmental monitoring.
- ✓ Scientists working with UNESCO are using the Internet of Things for instance, to improve **urban water management** (smart water systems) and, in biosphere reserves, to monitor biodiversity with drones and motion sensors.



ICTs for freshwater management

- ✓ **UNESCO's G-WADI Geoserver application** uses an artificial neural network (ANN) algorithm to estimate real-time precipitation worldwide.
- ✓ The system is now available through the iRain mobile application, devoted to facilitating citizen involvement in collecting local data for global precipitation monitoring.
- ✓ The use of a crowdsourcing functionality in iRain to supplement the data opens up opportunities for engaging citizen scientists.



ICTs for scientific research and experimental development

- ✓ The data generated and shared through **UNESCO online platforms** including the Global Observatory of Science, Technology and Innovation Policy Instruments (GO-SPIN), the Water Information Network System, and the indicators and statistics in science and education platform.
- ✓ As early as 2010, UNESCO's Abdus Salam International Centre for Theoretical Physics (ICTP) identified AI and data science as critical areas for its new strategic plan.
- ✓ UNESCO has been advocating the use of the Internet of Things for development. Between 2010 and 2018, ICTP organized 26 training activities on the Internet of Things in 20 developing countries stretching from Nepal to Benin.



ICTs for disaster risk reduction

UNESCO is a part of a consortium participating in a EU funded **I-REACT** project using a kit of new technological tools to reduce risks linked to natural disasters.

It includes drones to improve mapping, wearables to improve geographical positioning and glasses with augmented reality to facilitate reporting and information visualization by first responders.



ICTs for ecosystem and environmental management

The Man and the Biosphere (MAB) programme has some experience of using drones in the Biosphere Reserves for land use planning and monitoring.

Using field data acquired by drones, 3D models of Biosphere Reserve had been developed.

Motion-sensor cameras are already being used in the World Network of Biosphere Reserves to gather vast quantities of data on biodiversity inexpensively and unobtrusively



Elephants in the United Republic of Tanzania; drones and motion-sensors can help to monitor biodiversity but could also fall into the hands of poachers.



ICTs for geosciences



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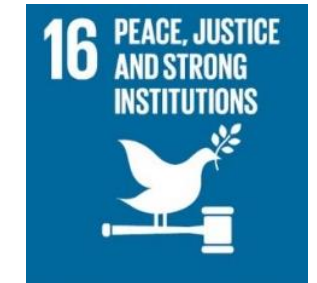
UNESCO Global Geoparks have used augmented and virtual reality to add to the visitor's experience by enabling them to visualize geological and/or environmental change more easily.

Through AI-driven data mining and analysis of visitor behaviour, customized programmes or routes and education packages matching the individual preferences can be developed.

ICTs for Communication and Information

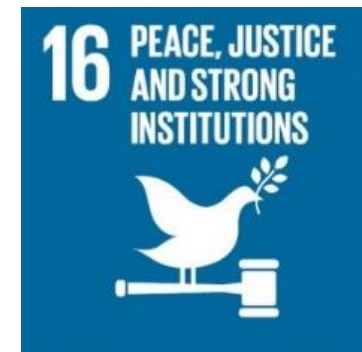
UNESCO supports Member States to build **inclusive information and Knowledge Societies**.

UNESCO has explored the impact of emerging issues, such as AI, the Internet of Things, big data and blockchain on freedom of expression and privacy and developed the policies and mechanisms needed for harnessing AI to advance knowledge societies and achieve the SDGs.



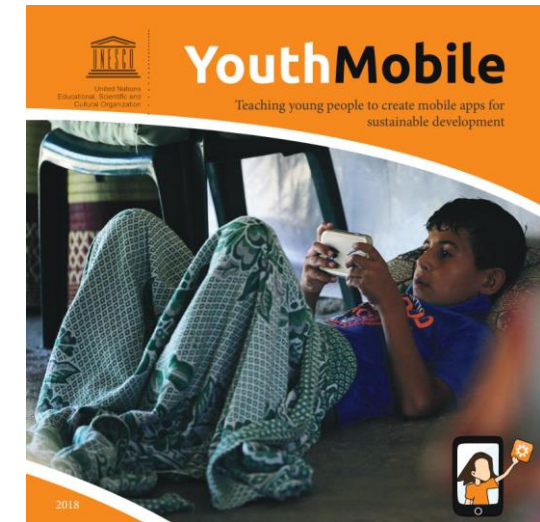
ICTs for open access to information

- ✓ In 2018, **International Day for Universal Access to Information** (IDUAI) critically evaluated the context of access to information and the growing relevance of advanced digital technologies like Artificial Intelligence now shaping how knowledge is accessed, processed and utilized.
- ✓ With regard to **Software Heritage**, in November 2018, UNESCO organized in collaboration with the Organization's **Memory of the World (MoW) Programme**, an expert meeting around the theme of preservation of Software Source Code as Heritage for Sustainable Development.



Youth involvement in ICTs

- ✓ **UNESCO YouthMobile programme** leverages computer literacy among young people for sustainable development.
- ✓ The session organized by UNESCO at the 2018 WSIS Forum on “**Youth, Access to Knowledge, and the SDGs: Strategies for Building Youth Skills in Digital Technologies**” highlighted policies and programmes that encourage youth involvement in ICTs.
- ✓ The activities demonstrate the efforts of UNESCO’s YouthMobile Programme to reduce digital inequalities, as well as spread the use of Open Source Software and Open Data for the development of knowledge societies.

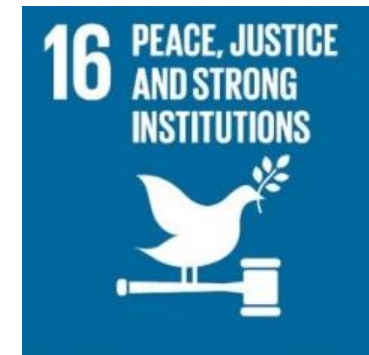


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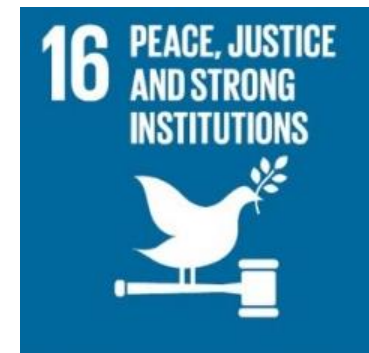
ICTs for freedom of expression and media development

- ✓ In 2018, UNESCO has actively advocated for and ensured multi-stakeholder consultation on the **Internet Universality Indicators framework** as a comprehensive tool for achieving the SDGs.
- ✓ UNESCO launched the **Observatory of Killed Journalists**, an online database providing information on the status of judicial enquiries into each killing of a journalist or media worker recorded by UNESCO since 1993.



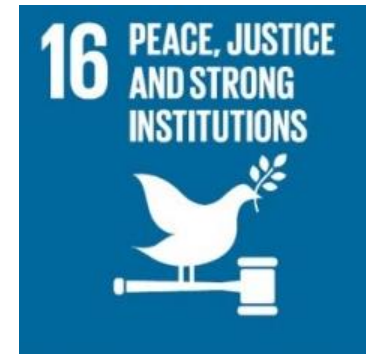
ICTs for freedom of expression and media development

- ✓ UNESCO's IPDC continues to support an extensive range of **media development activities** through 41 projects in 35 countries, including six regional ventures in 2018.
- ✓ UNESCO IPDC has also supported UNESCO's work in monitoring SDG 16.10.2 on access to information.
- ✓ The project "**Empowering Local Radio Stations with ICTs**" has continued to consolidate the capacities of local radio stations to provide low-income populations, especially women and girls, access to information and foster their active participation in the local development issues.



Ethical dimensions of the Information Society

- ✓ UNESCO continued to focus its work on the **ethical dimensions of disruptive technologies** in particular robotics and artificial intelligence.
- ✓ UNESCO also sought to play in 2018 a leading role in shaping a global debate on artificial intelligence (AI) by organizing Open discussions on AI on November 15th in Paris and a Forum on AI in Africa from 12 to 13 December in Morocco.
- ✓ UNESCO engaged with a group of media organizations and hosted a side event of IGF on Symposium on Media Development and Internet Governance which aimed to develop media development strategies to **shape global Internet governance**.



Thank you !



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