

ITU-ACADEMIA PARTNERSHIP MEETING

Developing skills for the digital era

Budapest, Hungary
19-21 September 2017

FINAL REPORT



INTRODUCTION

1. The ITU-Academia Partnership Meeting took place in Budapest, Hungary, from 19 to 21 September 2017. It was organized by the International Telecommunication Union and hosted by the National Media and Infocommunications Authority of Hungary.
2. The theme of the Meeting was “Developing skills for the digital era”.
3. The Meeting attracted around 90 participants from 32 countries, primarily from academic institutions. Other participants included representatives from government, industry, ITU Centers of Excellence and international organizations.
4. The key objective of the meeting was to identify opportunities for strengthening collaboration between ITU and academic institutions in developing capacities and skills, and contribute towards the global goal of preparing a workforce that is fit for the digital future.
5. Further information, including the agenda, the presentation slides, summary conclusions, the list of participants, and photos are available at: <https://www.itu.int/en/ITU-D/Capacity-Building/Pages/events/academia2017.aspx>

Tuesday, 19 September 2017

Opening ceremony and keynote address

6. The ITU-Academia Partnership Meeting 2017 was opened by Dr Monika Karas, President, National Media and Infocommunications Authority of Hungary and, on behalf of ITU, Dr Susan Teltscher, Head, Human Capacity Building Division, ITU.
7. A keynote address was delivered by Mr Zaid Hamzah, CEO, Asia Law Exchange, and Adjunct Senior Fellow, S. Rajaratnam School of International Studies, Nanyang Technological University, Singapore.
8. In his keynote speech, Mr Hamzah shared his insights on what he characterized as the New Learning Construct (“NLC”) in the industrial revolution 4.0 era. The learning and development landscape, like the rest of the economy, is undergoing a major digital transformation, driven by big data and analytics, Internet of Things, machine learning, robotics and artificial intelligence. The following were some of the issues raised in the keynote:
 - The NLC is about the emergence of a new kind of “learning operating system” in a data-driven economy where algorithmic thinking, machine learning, deep learning and artificial intelligence in a networked knowledge environment are the main features.
 - The confluence of technology, strategy and pedagogy is changing the way we learn. Big data analytics and data innovation will impact learning and development strategies. Adaptive learning driven by learning analytics and algorithmic thinking will increasingly become the new normal.
 - Academic institutions will need to redefine their roles in the industrial revolution 4.0 era. Curriculum design and development will need to be more nimble and adaptive. New pedagogical strategies are needed and there must also be tighter alignment between academia and industry to ensure that the output of education is fit for purpose.

Session 1: Developing skills for the 21st century digital economy: the role of academic institutions

9. The session looked at the role of universities in shaping the digital transformation, how technological change is shaping the future of e-learning and how universities are changing their academic programmes to embrace these emerging topics and technology trends.
10. Panelists highlighted that the digital transformation and the related data revolution is changing profoundly our societies and economies. The future digital ecosystem is characterized by emerging technological changes related to the Internet of Things (IoT), Artificial Intelligence (AI), machine learning and big data, among others. In particular, IoT and AI are new and transformative technologies.
11. Panelists agreed that data is increasingly seen as a strategic asset and technologies like big data analytics, machine learning and artificial intelligence should be seen as aid to thinking.
12. A number of new skill sets were identified that will be required in the future, such as IoT developers, skills in data analytics techniques, distributed and networked systems and cybersecurity. In the future, routine work will be more and more automated and humans need to focus on their core competencies. There is a need to take a systemic approach in the learning and development of new skills for the digital era.

13. There was recognition that academic institutions will need to be adaptive in the design of course contents in the industrial revolution 4.0 era and universities are already adapting their academic programmes and curricula in order to shape such changes and prepare students for the 21st century digital world. These include new Master's programmes in the field of IoT, AI, robotics, data science, business analytics and big data.
14. In addition to technical or hard skills, there is also a need for business and entrepreneurial skills (e.g. vision, perseverance, creative problem-solving) and other soft skills (e.g. collaboration/team working, curiosity, communication, storytelling). Especially important in our emerging data-intensive economy are skills necessary to verify data ("how to trust data").
15. A key challenge that needs to be part of the curriculum relates to risks and ethical questions; therefore, ethical and societal values need to be included in the design of new products and technologies and at the core of learning. Panelist highlighted that values remain at the core of new technologies such as AI. The design of AI must incorporate the design "for values" or "responsible AI". In particular, the importance of ART (accountability, responsibility and transparency) in the design and development of AI tools and processes was stressed.
16. During the discussions involving participants from the floor, the following issues were raised:
 - How to ensure that non-ICT faculties such as those in humanities and social sciences, including philosophy, do not get side-lined or marginalized. There is a clear need for a multidisciplinary approach when it comes to developing new academic programmes related to emerging technologies.
 - The need for taking an inclusive approach in developing skills for the digital era that includes those with no technical skills – for example, one can ask philosophical issues in the context of the design of AI-driven technologies.
 - The need to ensure that all universities - and not just the "elite" universities - participate in the process of reskilling and relearning in the industrial revolution 4.0.
 - How lifelong learning fits into the entire educational system provided by academic institutions.
 - The need to ensure that as we discuss industrial revolution 4.0, other critical issues such as climate change and sustainability are also discussed without diminishing its importance as we get overwhelmed by emerging new technologies.

Session 2: Enhancing capacity in Internet governance through academic programmes

17. The session discussed the role of academic institutions in building skills in the field of Internet governance, and examined the work undertaken in this area. Panelists shared their experience in developing and implementing academic programmes related to Internet governance. A number of new programmes and institutes related to Internet governance have been launched over the past few years, most of which have an interdisciplinary focus.
18. The session highlighted that the rapid evolution of ICTs also led to an increase in the scope and level of complexity in the field of Internet governance. Internet governance now encompasses not only matters related to the technical administration of the network, but also to an ever growing myriad of issues related to policy and regulatory realms affecting individuals, organizations, and nations, such as cybersecurity, privacy, data protection, among others. The need for capacity development, a precondition for meaningful involvement in the decisions about the future of technology, is therefore paramount.
19. The Internet governance ecosystem covers a wide spectrum of topics (from technical infrastructure to cybersecurity and policy issues) and a variety of stakeholders. These include governments, private

sector, the technical community, civil society, academics, international organizations etc. Designing new governance institutions is an ambitious task and still under development. Currently, private organizations and their terms of services exercise significant power over the use of the Internet.

20. Universities are key agents when it comes to building capacities in Internet governance, to address the future challenges related to the digital era. Core issues to be considered relate to accountability, responsibility and transparency of the governing system and structures. Academics need to create the evidence for policy making and ensure that the research undertaken is based on principles related to human rights and justice.
21. The session highlighted that academic institutions need to embrace Internet governance as a key area of academic discipline. Given the multidisciplinary nature of Internet governance, an interdisciplinary academic approach involving different faculties is required.
22. Panelists highlighted that a number of different skills are required for effective governance, including translational skills (translating research into mediums for policy makers) and skills required for building networks and navigating complex power relationships and policy structures.
23. Participants also mentioned the various stakeholders that provide capacity building in the field of Internet governance. They stressed that ITU should strengthen its collaboration with universities and other Internet governance stakeholders in building capacity in this important discipline. ITU could also play an important role in fostering partnerships at the international level by bringing together stakeholders from all countries, in particular the developing world.

Session 3: New paradigms for teaching and learning in academic institutions

24. The session discussed changes in the teaching and learning environment and recognized that these changes are a result of emerging technologies such as the Internet of Things, big data and artificial intelligence. The discussions also covered the importance of evaluating the skills and capabilities that universities need to prepare for the future.
25. The session recognized that new skills that are needed in the digital era include communication skills, independent learning skills, ethics and responsibility, thinking skills, and digital skills. The session also observed that the digital era learner is diverse and demands training objectives that are relevant to work and real life application.
26. Panelists observed that due to these changes, universities are adopting new methods of teachings such as hackathons and flipped classroom, even though it is difficult to measure working hours of the teacher and ensure the quality of e-learning sessions.
27. Panelists shared their experiences in implementing these new methods of learning, demonstrating how the world of academia is re-inventing itself to accommodate current teaching and learning demands, such as through curriculum re-design and focus on philosophies that promote digital learning.
28. Panelists observed that a change in academic mindset has to be encouraged to accommodate new methods that are now being used in learning, such as studio-based learning and online coding. The need for universities to focus on adapting curricula to accommodate these new teaching and learning methodologies was emphasized.

29. The session recognized that universities should consider investing in technology-enabled learning spaces to support the current learning demands and methods. The introduction of digital learning spaces will also require that professors/trainers be retrained to manage and use these digital learning spaces effectively.

Wednesday, 20 September 2017

Session 4: Re-defining the role of academia in the digital economy: universities as incubators of ICT innovation

30. The session discussed the role of universities in driving ICT innovation through incubation and how universities have contributed to producing ICT sector disruptors. The discussions recognized that universities are continuing to produce a number of small businesses through incubation processes and promote ground-breaking innovations.
31. Panelists shared case studies of their projects and the achievements realized from these projects. These achievements include programmes which aim at producing graduates who have both the ability to operate across disciplines and the depth of knowledge in specific fields of study; hosting virtual incubator platforms; coordination of multinational entrepreneurial trainings; and organizing creative coding workshops, among others.
32. The session recognized that fast and focused learning, which can be achieved through incubation, enhances the learners' competencies and attractiveness to the labour market. This understanding was emphasized by the observation that education in the digital era should be action-oriented and aimed at meeting the needs of the employer.
33. The session observed that in the digital era, developments are driven by ICT innovation resulting in the demand for innovation and incubation, which is growing as rapidly as the technology it serves. Panelists suggested that universities should expand their innovation labs into departments to accommodate this growing demand, and use experienced employees to contribute to incubation programmes.
34. The session highlighted that industry could increase its involvement in the work of academia through participation in activities such as curriculum development, increasing funding for research, hosting internships and providing access to its laboratories for use by the academic community.

Session 5: Developing a workforce fit for purpose: A dialogue between academia and industry

35. This session discussed the skills shortages brought about by emerging technologies and the changing ICT environment, observing that academia and industry need to work together to identify and agree on the most critical skills required by industry, now and in the future.
36. Panelists stated that there is need for active labour market policies to allow for employee mobility, which should be supported by training and opportunities for lifelong learning to ensure that workers remain productive.

37. Panelists highlighted the need for academia to focus on creating communities of interdisciplinary research and innovation, and promote challenge-driven learning.
38. The panelists stated that 80% of research impact is from research undertaken in collaboration with other stakeholders. The session emphasized the importance of industry–academia collaboration in converting innovative research findings into new products and industrial processes.
39. The session recognized that there is need for flexible policies relating to intellectual property rights and patents to allow for transfer of research from universities to industry to promote the use of research findings in practice. This requires the involvement of a third party, which is the policy maker or Government.
40. The session recognized that collaboration between industry and academia is no longer only for research, but includes new requirements like incubation of emerging businesses, setting up industry certification and accreditation as well as collaborations to plan for skill changes and new skills demand.

Session 6: Fostering collaboration between universities and ITU Centres of Excellence

41. The session discussed the impact of collaboration of ITU CoEs with academia, and how these collaborations benefit each stakeholder. The collaboration includes delivery of specialized ICT courses for university students, access to CoE equipment for practical exercises required by university, joint research and consultation for public market.
42. Panelists shared their experiences as ITU CoEs, noting that ITU CoEs are not in competition with universities but rather complementary. This was demonstrated by the types of participants that follow CoE courses such as employees of national regulatory authorities, Government ministries, network service providers, university professors and students.
43. The session highlighted that successful CoE courses use updated curricula, multiple delivery channels, design courses within the limits of the ITU focus area, provide consistency in course delivery and adapt training to follow practices that participants can easily understand.
44. Panelists stated that collaboration of CoEs with universities enables CoEs to benefit from the high level of expertise hosted in universities, while universities can benefit from technical know-how and laboratory equipment of the CoEs. One of the key elements of success that academia can bring to CoEs is the application of academic standards to e-learning courses.
45. The session observed that CoEs can leverage on the academic reputation of universities and recognition of qualifications conferred by universities, access to technical databases and bibliographic references as well as thesis reports not available to the public, if required. Universities could access the market for professional courses and summer schools through partnerships with CoEs, technological surveillance reports as well as access to ITU documents that CoE have access to by virtue of being an ITU CoE.

Session 7: ITU Academy partnerships between CoEs, industry and universities: a practical example of the work on spectrum management

46. This session focused on case studies of different ITU partnerships with a focus on partnerships established to develop and deliver the ITU Spectrum Management Training Programme (SMTP). The SMTP was developed under the auspices of the ITU Academy, with the support of the academic community. ITU is collaborating with universities and other training providers to deliver this programme and concrete examples were highlighted in the session.
47. Panelists stated that partnerships to contribute to ITU work depend on the commitment of individuals within the partnering institutions. The panelists highlighted the contribution of modules to the SMTP development by Universidad ICESI, Tes America, the National Agency for Spectrum (ANE) of Colombia, and the Czech Technical University.
48. Panelists noted that bureaucracy in universities can be a challenge in getting quick decisions on collaboration with other bodies. Furthermore, the process of obtaining approval to introduce a new degree programme is lengthy and by the time a programme is approved, it may no longer be as relevant.
49. The session highlighted that the training material developed by ITU is thoroughly peer reviewed to ensure that it meets both quality and neutrality standards.
50. Panelists commended ITU for development of very rich training materials, and observed that contributions by the academic community is important in this process to ensure high quality of the materials and alignment to pedagogical requirements.
51. Panelists recognized that programmes such as the SMTP can be used to help students acquire cutting-edge technical skills even before new technologies are incorporated into their university syllabus. It was stated that there are different options to deliver ITU training programmes which include delivery of single modules, incorporating selected modules to already existing university programmes, or delivery of the complete programme toward the award of a Masters degree.
52. The session called upon universities to consider partnering with ITU to deliver the SMTP and other ITU training programmes.

Thursday, 21 September 2017

Session 8: Strengthening ITU-academia partnerships for capacity development

53. Based on the discussions held on the previous days, this session discussed ways and means of how ITU and the academic community could strengthen their collaboration to develop capacities and skills for the digital future. Panelists presented examples of successful collaboration and made proposals for future partnership opportunities. The discussion was opened to the entire audience and a number of suggestions were made.

54. Delegates recognized the scope for cross-sectoral collaboration in capacity building in ICT involving academic institutions, private sector, government, and ITU. The scope for collaboration in capacity building is wide, ranging from joint development of training materials, delivery of training, provision of subject matter experts to act as peer reviewers of training materials, among others.
55. The ITU Centers of Excellence, many of which are also academic institutions, are good examples of successful collaboration between ITU and ICT training institutions. The meeting encouraged greater collaboration between universities, ITU and CoEs. In the future, ITU should consider establishing CoEs that will focus on emerging issues such as Big Data, Internet of Things, and Artificial Intelligence.
56. The ITU Academy was highlighted as an excellent tool for the delivery of training. The ITU Academy should be used to further promote collaboration with academic institutions, share content, and deliver training courses; it was also mentioned that the ITU Academy platform should be adapted for use via smart phones.
57. Delegates agreed that ITU and academic institutions could cooperate in the joint development of training materials and the delivery of training programmes in areas of priority to ITU membership and in which the academic institution has unique competencies.
58. Many delegates highlighted the important role of ITU in capacity building as it is seen as a neutral, honest broker. Academia can partner with ITU without the fear or risk of capture that is normally associated with special interests of corporate organizations. ITU was adequately placed to bring together supply and demand for ICT training and should accelerate its work to achieving this.
59. One of the great advantages of ITU was thought to be its global reach and large worldwide membership. ITU should take the role of convener, facilitator, matchmaker and broker to formalize relationships between different partners. There was a high demand for events such as this one, which should be organized regularly to facilitate partnerships and knowledge networks.
60. Delegates also made suggestions concerning ITU's future work on Internet governance. Here, ITU should consider becoming a clearing house for information and knowledge on capacity development in Internet governance. For example, a database including people and resources related to Internet governance capacity development would be very useful and does currently not exist.
61. The ITU annual online publication "Capacity Building in a Changing ICT Environment" was mentioned as an excellent example for academics to collaborate with ITU and contribute relevant research papers and articles. In particular, researchers in their early stages of career could benefit greatly from disseminating their work globally through this publication. Call for papers are now open for the 2018 edition which focuses on building capacity for the 21st century digital economy, with emphasis on how major digital transformations such as artificial intelligence, machine learning, the Internet of Things and big data analytics, change skills requirements and in turn impact capacity building and skills development.
62. The ITU Global ICT Capacity Building Symposium (CBS) was considered as providing another concrete opportunity for bringing together different partners to showcase and discuss collaboration in the field of ICT skills development. All delegates were invited to participate in CBS 2018.
63. The ITU Journal "ICT Discovery" was presented and participants encouraged to submit articles. The first issue of the journal will focus on the impact of Artificial Intelligence on communication networks and services. The Journal could also be useful for building capacities among students and used as a reference document.

Final conclusions

64. On behalf of NHMM, Dr Péter Vári, Deputy Director General, National Media and Infocommunications Authority of Hungary, presented the summary report of the Meeting. The report is available at <https://www.itu.int/en/ITU-D/Capacity-Building/Pages/events/academia2017.aspx>.

Closing Ceremony

65. The meeting closed with closing remarks by ITU and the host.