香港教育大學
The Education University of Hong Kong

Research and Development and its Role for Digital Learning to Address Education Quality, Equity and Efficiency

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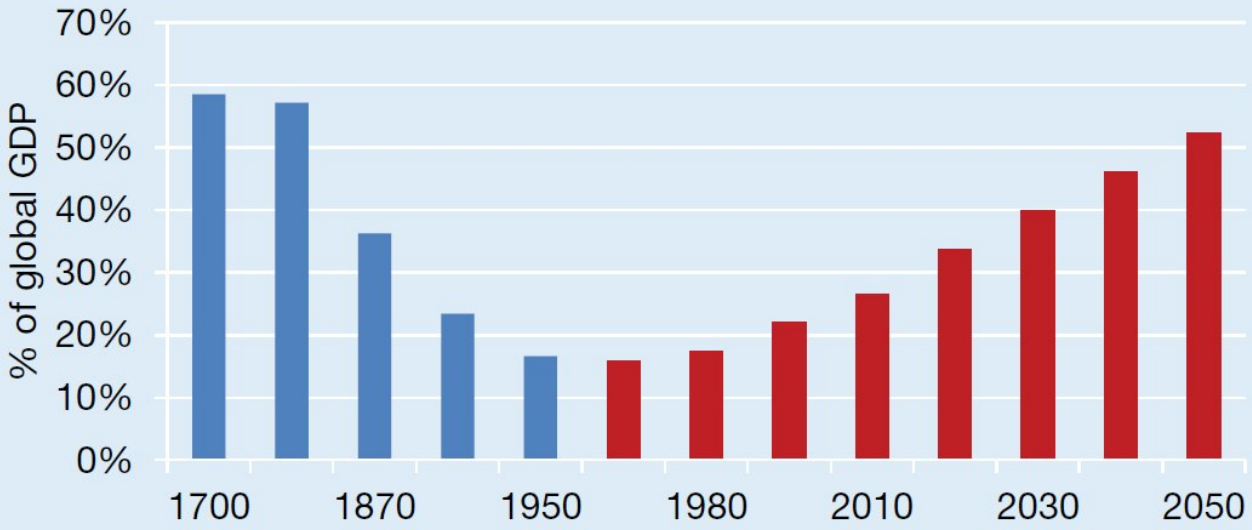
The Education University of Hong Kong ranked 2nd in Asia and 12th in the world in Education (QS World University Rankings by Subject 2016)

Introduction: The Asian Century

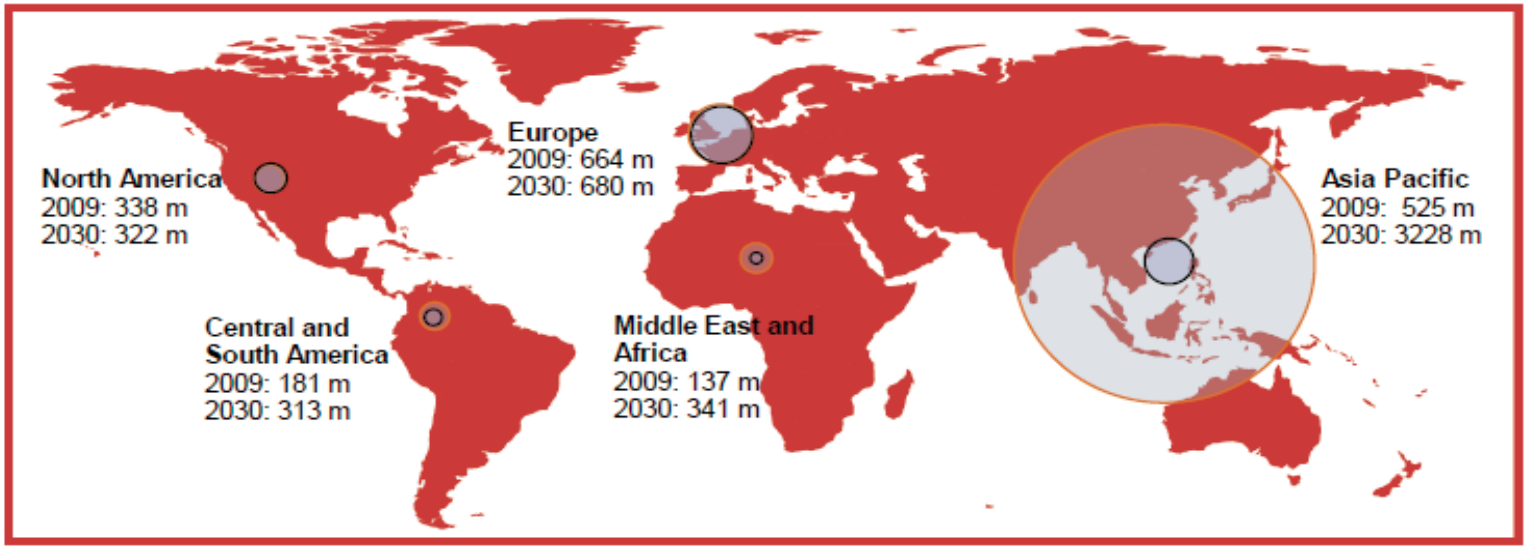
Figure 1 **Asia's share of global GDP, 1700–2050**



Source: Maddison (1700–1950) (2007); Centennial Group International estimates (1951–2050) (2011). Data for 1750–1790 are PPP and data for 1991–2050 are in market prices.

In the ADB's publication Asia 2050, it predicts that another 3 billion Asians will enjoy similar living standards to those in Europe today, with Asia accounting for more than half of the global output by 2050.

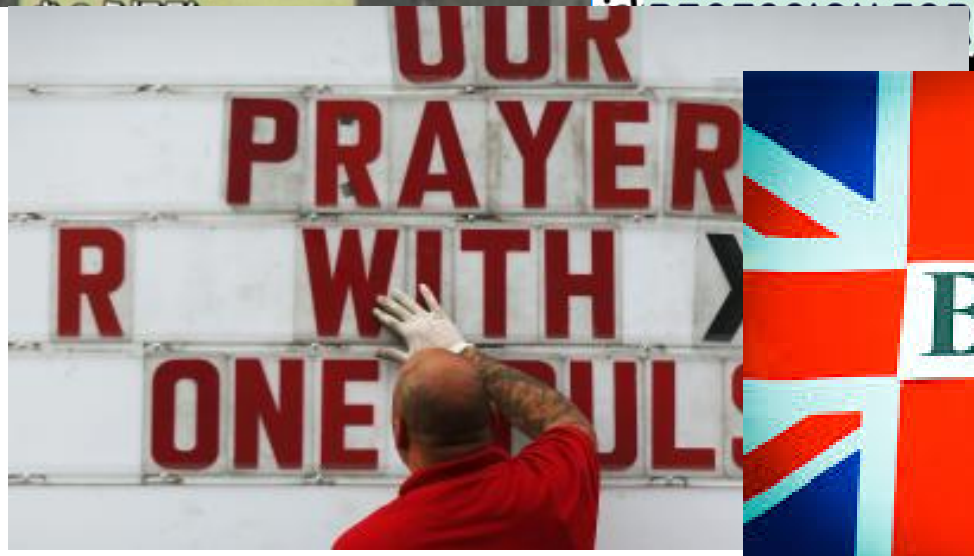
Introduction: The Asian Century



Note: 'Middle class' is defined as those households with daily expenditures of between US$10 and US$100 per person. The black border circles and orange border circles depict the size of the middle-class population in 2009 and 2030 respectively.
Source: Kharas & Gertz (2010).

Asia is becoming and will be the world's largest producer of goods and services, and will be the world's largest consumer. It is already the most populous region in the world and will most probably form the majority of the world's middle class by 2050.

Introduction: The Asian Century?



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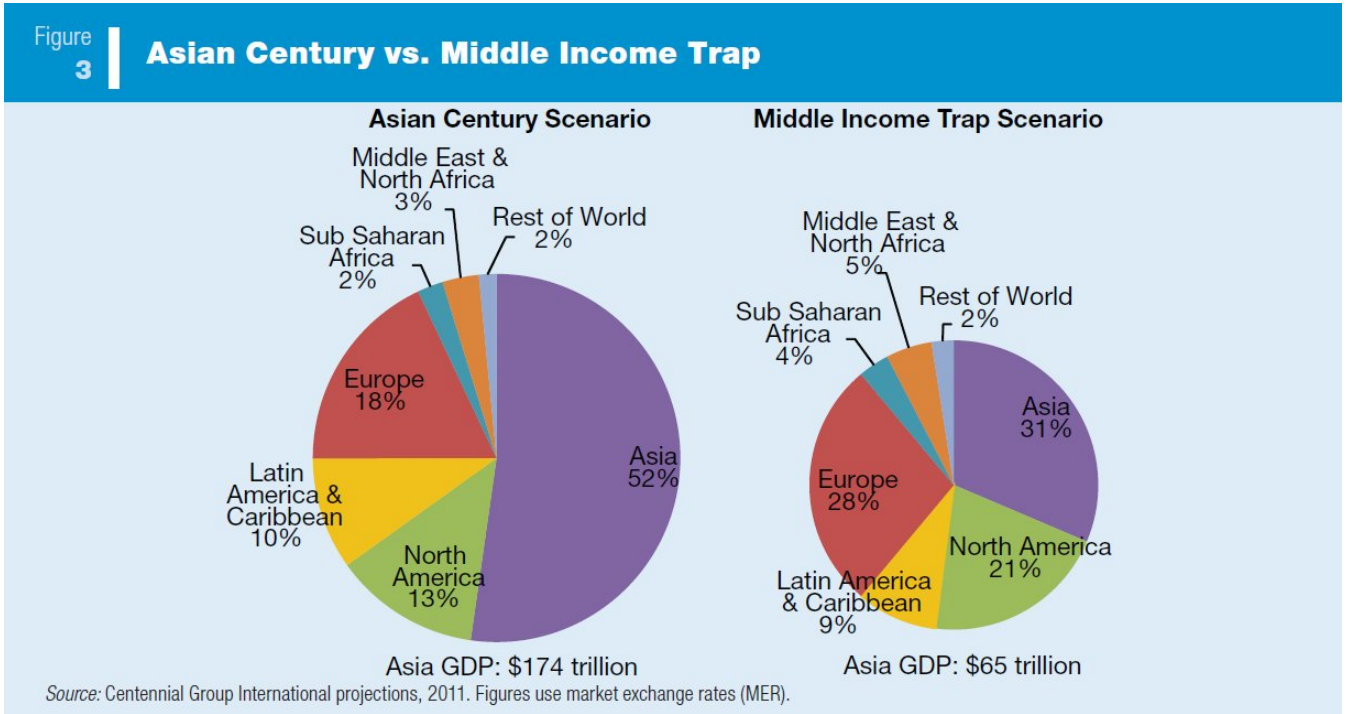


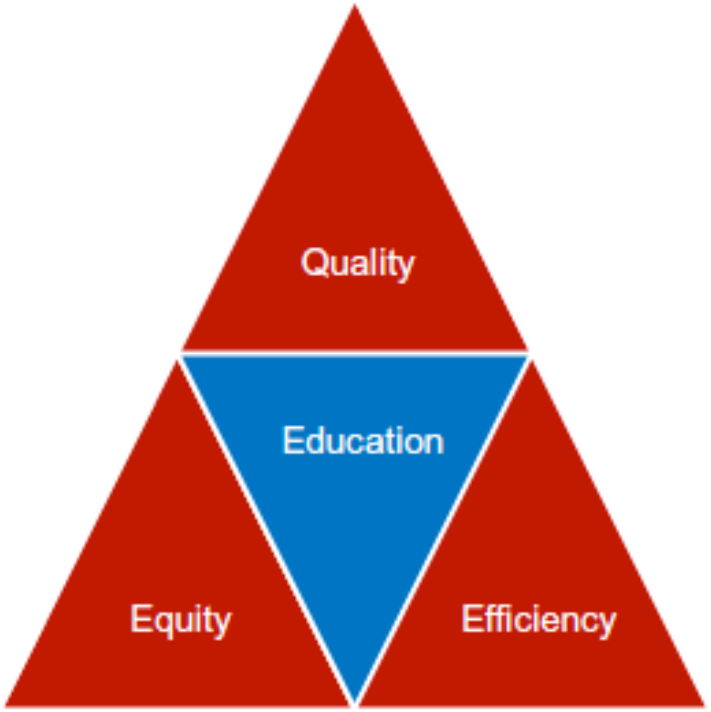
For Asia to sustain its growth and make the Asian Century a reality, it has to harness on the potential of the rapid advancement of technology, and makes sense and manage the global level of economic, ecological, social, political and cultural integration across countries that are part of globalisation.

Introduction: The Asian Century

- In such a new world order, young people in Asia have to be prepared to be agents of change rather than just passive observers of world events; and at the same time, to live together in an increasingly diverse and complex society and to reflect on and interpret fast changing information.
- Young people need to critically examine local and global issues across boundaries (country-country or rural-urban) and act upon them.

Equity, Quality and Efficiency

Education in developing Asian countries faces three key, inter-related challenges – **equity, quality, and efficiency.**



(Ra, Chin, & Lim, 2016)

Equity, Quality and Efficiency

- Quality: Capacity of governments and institutions to meet the particular learning needs of particular learners in particular settings. This is most important with the wide ranging and diverse educational contexts within and across countries.
- Equity: Pertains not only to access and participation but also to educational survival, transition, completion, and achievement.
- Efficiency: Efficiency is an economic measure of education systems performance. Internal efficiency involves the optimization of inputs (teachers, administrators, facilities, instructional methods, teacher professional development, etc.) to produce the desired outputs (learning gains). On the other hand, external efficiency relates to the outcomes of an education system.

Digital Technologies for Enhancing EQE

Research studies in education have shown that **digital technologies coupled with appropriate pedagogical strategies** engage students in teaching and learning activities and have positive impact on cognitive outcomes (e.g. literacy and numeracy), meta-cognitive outcomes (e.g. task management and self-regulation), and affective and social outcomes (e.g. confidence, social interaction, & communication).

Digital Technologies for Enhancing EQE

- However, the integration of digital technologies in education in Asia has by and large been more substantial, both in terms of scale and sophistication, in developed countries than in developing ones.
- These challenges in digital learning uptake may be attributed to differences in infrastructural, technological, and socio-economic conditions; strategic thinking; curriculum design and overall education planning; and levels of investment in both technology build-up and research and development (R&D).

Role of Research in DL4D

- R&D has been a critical pillar of the digital learning development master plans of countries such as China, Japan, Singapore, and South Korea.
- It serves three pivotal functions in the country's overall education planning:

1. system-wide scaling up of innovations in technology-enhanced learning environments;
2. evidence-based practices and policies for digital technologies in education; and
3. adaption and customization of promising practices and models of digital technologies in education from one context to another.

Role of Research in DL4D

- The absence of a robust body of evidence for or against adoption of particular innovations across a range of diverse developing country contexts suggests that a more prudent approach by these countries to accelerating adoption may be warranted.
- Sustaining and scaling up a new innovation that does not work may mean diverting scarce resources from a traditional one that does.
- It is clear therefore that for developing countries in Asia to effectively take up the affordances of digital learning, R&D in developing country contexts must be strengthened.

DL4D | DIGITAL LEARNING FOR DEVELOPMENT

IDRC | CRDI
International Development Research Centre
Centre de recherches pour le développement international

UKaid
from the British people

FIT-ED
Foundation for Information Technology Education and Development, Inc.

Partners

ALL CHILDREN READING:
A GRAND CHALLENGE FOR DEVELOPMENT

USAID
FROM THE AMERICAN PEOPLE

World Vision

Australian Aid

Aim and Specific Objectives of DL4D

To examine how digital learning may be used to address issues of equity, quality, and efficiency at all educational levels in developing Asian countries:

- To contribute to the body of knowledge on digital learning in developing countries in Asia
- To promote two-way knowledge transfer, professional learning, and capacity building on digital learning among researchers, practitioners, and other stakeholders in developing countries in Asia
- To foster international collaboration and partnerships on digital learning research and development in developing country contexts in Asia and the rest of the world
- To promote evidence-based and data-driven policy-making and action at national and sub-national levels in developing countries in Asia

DL4D | DIGITAL LEARNING FOR DEVELOPMENT

Formulating Guidelines for Research in DL4D by:

- Review the current and existing digital learning for development research agendas or programmes that focus specifically on promoting equity, quality and efficiency in education as spelt out in the SDGs especially the SDG 4 (“inclusive and equitable quality education and promote lifelong learning opportunities for all”).
- Identify the major themes of the research programmes/agendas; and
- Identify potential gaps that need to be considered in order for research in DL4D to be more impactful.

And by doing so, it will :

- Enable an informed conversation among key players and stakeholders of DL4D research, funding, policy and practice communities; and
- Deepen existing research agendas and programmes on digital learning innovations through fostering international collaboration and partnerships on DL4D research.
- Formulate a set of guidelines to inform DL4D research.

Research Questions

Research Questions

MAIN QUESTION:

What is the nature of the DL4D research agendas and programmes with reference to equity, quality and efficiency in education since 2006?

Research Questions

SUB-QUESTIONS:

1. What are the research aims?
2. What are the research methodologies that have been applied?
3. What are the outcomes that have emerged from the research?
4. Who are the target audience (beneficiaries) of this research?
5. Who have supported and funded the research?
6. What are the DL4D research gaps that may exist?

Methodology

Methodology

Eligibility Criteria:

- Scholarly papers were restricted to peer reviewed journal papers published within the last decade in English language journals between the years 2006 to February 2016 that were written on themes related to equity, quality and efficiency in education and their intersection with DL4D.
- White papers: restricted to DL4D and education equity, quality and efficiency published between 2006 and February 2016.
- Policy papers: restricted to DL4D and education equity, quality and efficiency produced in draft or official form between 2006 and February 2016.

Methodology

Databases Searched

- ACM (Association for Computing Machinery)
- ASSIA (Applied Social Sciences Index and Abstracts)
- Cambridge Journals Online
- Springer
- JSTOR
- Oxford University Press (journals)
- Science Direct
- EBSCO (consisting of Psychology and Behavioural Science, PsycINFO, SocINDEX, Library, Information Science and Technology Abstracts, CINAHL)
- ERIC (Education Resources Information Center)
- IngentaConnect
- Emerald
- IEEE (Institute of Electrical and Electronics Engineers)
- Computer Society Digital Library (CSDL)

Methodology

Selection of Papers for Inclusion

- It focuses on the themes of equity, quality and efficiency in education specifically supported by digital learning and digital technologies;
- It focuses mainly on DL4D agendas and guidelines that structure, support, guide and direct national policy and practice to achieve education equity, quality and efficiency; and
- It is published between the years 2006 to 2016.

Key Findings and Discussions

Findings: DL4D Agendas/Programmes

Name of Country	Agendas
France	5
Australia	5
Canada	3
NA/Global	3
USA	2
UK	2
India	2
USA and others	2
The Netherlands	1
Italy	1
Germany	1
Switzerland	1
Philippines	1
Malaysia	1

Findings: DL4D Projects

Key purposes	Paper Number
Provide a **guidelines** and **analysis** related to implement technology for **educational improvement**	#30 #14 #13, #8, #5
Examine the **impact** of emerging technologies for **teaching and learning** at **higher education**	#21 #22 #29
Understand the concept of mobile learning and its significant roles to improve access in education in both **developing** and **developed countries.**	#28 #27
Assess the **e-readiness** of ICT integration in education system.	#18
Provide overview of **Computer and Literacy (CIL)** education at **international level**	#24, #25
Understand the **key concept, potentials and challenges** of providing **universal access** to **high-quality digital learning**	#23 #15
Explore the ways in which **education technology** can contribute to the development of **child-focused development goals**.	#19
Explore how ICT can be applied to **empower children** and **adolescents** of their rights.	#6
Identify the **gaps** and develop a **recommendation** how to implement ICT for education in **conflicts** and **crisis**.	#17 #16
Develop a **recommendation** for **policy framework and guidelines** on ICT for Education to advance **gender equality** and **women's empowerment**.	#1, #3
Explore the **potentials** and **challenges** of **Massive Open Online Course (MOOC)**.	#2
Understand how **technology** can support **teaching and learning** of students with **refugee background.**	#20
Explore the **critical issues**, **potentials** and **challenges** of **ICT** to enhance **Science Technology Engineering and Math (STEM) education**.	#10, #11, #12
Explore the use of **potentials and challenges** of using the **technology** for **Vocational Education and Training (VET)**.	#26

Findings: DL4D Projects

Themes

1. ICT in Education Overview and Trends
2. ICT in Education Policy and Framework
3. ICT in Education for Developing Countries
4. Access to ICT in Education

Discussion and Analysis

Equity

- Broadening Access through Digital Learning
  - How, to what extent, and in what contexts do digital learning innovations broaden access to education in developing countries? For whom and under what conditions?
- Gender and Digital Learning Innovation
  - Are there any differences in participation in digital learning innovations based on gender? Are benefits and risks the same for males and females? What factors contribute to any gender-based differences?
- Strategy for Greater Inclusion
  - What strategies can be employed to achieve greater inclusion?

Discussion and Analysis

Quality

- Learner Engagement
  - How, to what extent, and in what contexts do digital learning innovations enhance learner engagement in developing countries?
- Learning Outcomes
  - How, to what extent, and in what contexts do digital learning innovations improve learning outcomes in developing countries? What particular learning outcomes and under what conditions?

Discussion and Analysis

Quality

- Differential Effects
  - Are there differential effects across learning domains, levels, settings, types of learners, level of technology integration, etc.? If so, what factors account for these differences?
- Teacher Professional Development
  - What are the parameters and requirements for teacher professional development and professional learning in relation to digital learning innovations? What strategies may be employed to meet these requirements?

Discussion and Analysis

Efficiency

- Cost Effectiveness
  - Are digital learning innovations in developing countries more cost-effective than comparable traditional interventions? What are the trade-offs? Given these trade-offs, under what conditions are digital learning innovations desirable?
- Alignment to Societal Needs and Aspirations
  - How and to what extent do digital learning innovations improve the fit between education and societal needs and aspirations in developing countries?

Gaps

Gaps

1. Lack of guidelines for how to improve the collaboration between developed and developing countries.
2. Lack of focus on the minority and disabled groups; while they are considered as key target groups in broadening access through digital learning, there is a lack of research of how digital learning enhances the quality and equity of this target group.
3. Lack of focus on how gender equality could be improved with digital learning, especially in Asian developing countries.
4. Lack of guidelines for how governments, international organisations and donor communities could support the scaling up of digital learning for digital learning for development prototypes.

Gaps

5. Lack of guidelines for setting up and sustainment of partnerships (public-private, government-school, university-school and school-school)
6. Lack of focus on enhancing the quality of learning experience of the learners that includes the relationship between the learners and their instructors and learning engagement.
7. Lack of focus on cost-effectiveness and the types of data necessary to engage in cost-effectiveness studies.
8. Lack of focus on clear indicators for the effectiveness of digital learning for development.

Conclusion

Conclusion

Research agendas/programmes for digital learning for development have to be aligned to Education 2030 and the Qingdao Declaration. Although most of these agendas/programmes are aligned, there are various gaps that have to be addressed in order to enhance equity and quality, and improve efficiency. Guidelines then have to be formulated for the development of such agendas/programmes. When these identified gaps are addressed, it is then more likely that digital learning for development research fulfils its pivotal roles in sustaining and scaling up digital innovations, informing digital learning practices and policies, and ensuring knowledge transfer and sharing.

Thank You

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