



Adaptive Success Factors

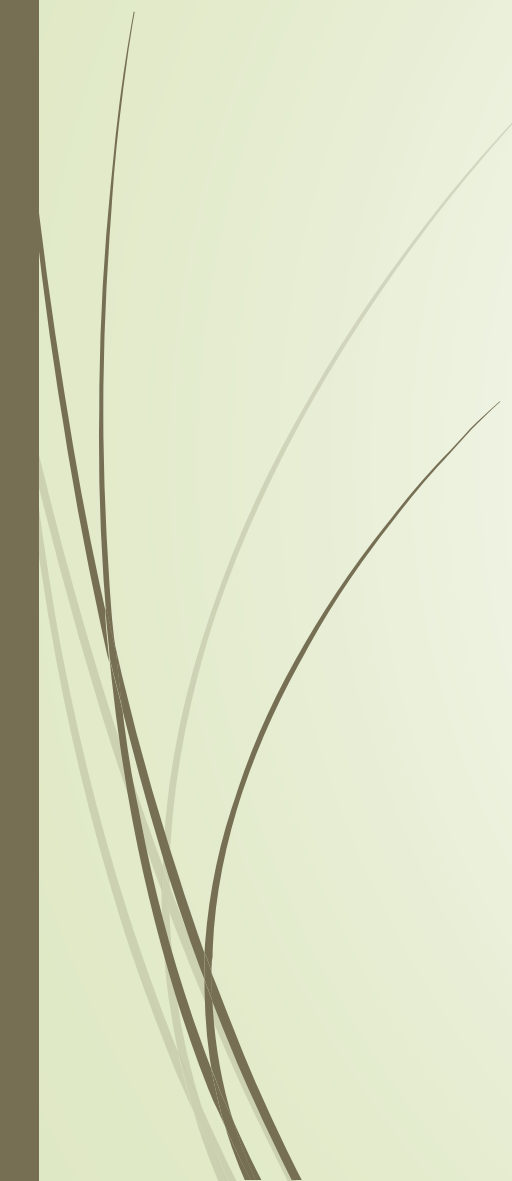
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Overview

- ICT in Education context
 - Singapore's ICT Masterplan Journey
 - Adaptive Success Factors
 - Concluding Remarks
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Changing ICT in Education Context

- ▶ Key changes
 - ▶ Early 1990: Appearance of Internet
 - ▶ Early 2000s: Web 2.0 tools
 - ▶ Late 2000s: Web 3.0 tools – data collection & analytics
- ▶ Use of ICT in education
 - ▶ Efficiency: Productivity gain, no real change in T&L
 - ▶ Transformative: Pedagogy-driven, potential for deepened learning
 - ▶ ‘Connectedness’: Social-, community-driven, uncertain learning outcomes



Impact of Changing Context

- From many students to one institution to many-to-many relationships
 - Sources of Values, Skills & Knowledge expanded considerably
- Teachers no longer in full (or nearly-full) control of learning outcomes
 - Particularly in connected era
- Certification
 - What constitute an education certificate?
- Need for attitudinal & pedagogical responses from educators
 - Eg. increasingly important to achieve 'balance of perspectives'



ICT Masterplan in Education

- ▶ Why?
 - ▶ Part of overall IT plans for Singapore
 - ▶ Strengthen human and physical infrastructure
- ▶ Key principles
 - ▶ Pedagogy-led developments
 - ▶ Whole-of-system transformation (policy-makers, school leaders, teachers & researchers)
 - ▶ Scaling of 'kernel', enhance local capacity
 - ▶ Alignment of policies (economics, manpower & education)



Singapore's ICT Masterplan Journey

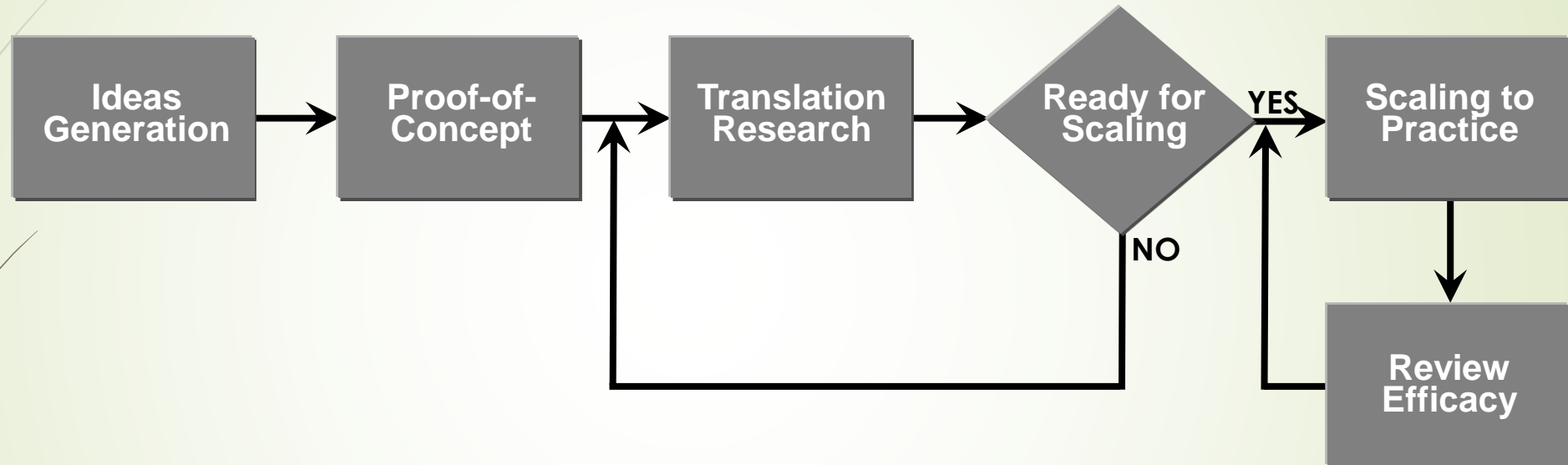
- ▶ mp1 – Building the foundation (1997 – 2002)
 - ▶ Uneven use of ICT
 - ▶ Build-up of physical and human infrastructure
 - ▶ mp2 – Seeding Innovation (2003 – 2008)
 - ▶ Start of greater school autonomy
 - ▶ Build-up of structures to push innovation (eg. Future schools)
 - ▶ mp3 – Strengthening and Scaling (2009 – 2014)
 - ▶ Emergence of good practices
 - ▶ Ideas-to-practice framework to scale practices
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A closer look at mp3

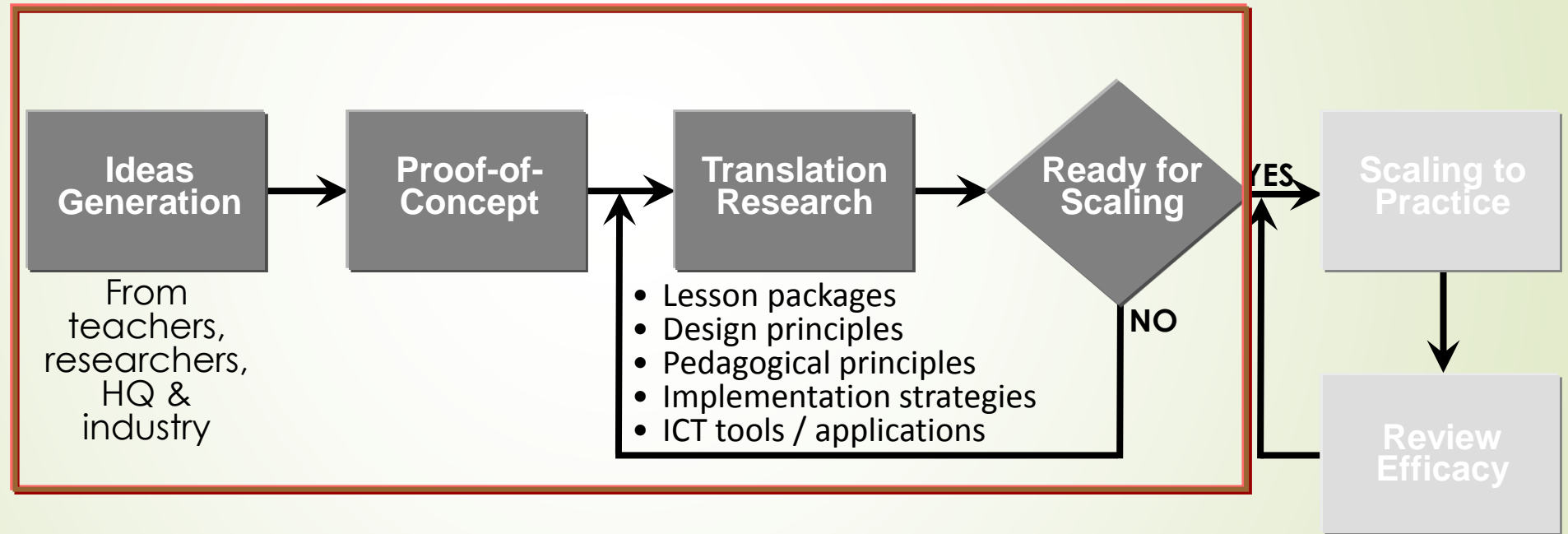
- Integrate within curriculum framework (C2015 – Strong Fundamentals, Future Learnings)
- ‘Culture-building’
 - Deepen ground understanding and expertise
 - Transform ‘way of thinking’
- Incorporate 21st Century Competencies
- Embrace ‘cyber wellness’
- Tracking of progress – evaluation studies

From Ideas to Practice

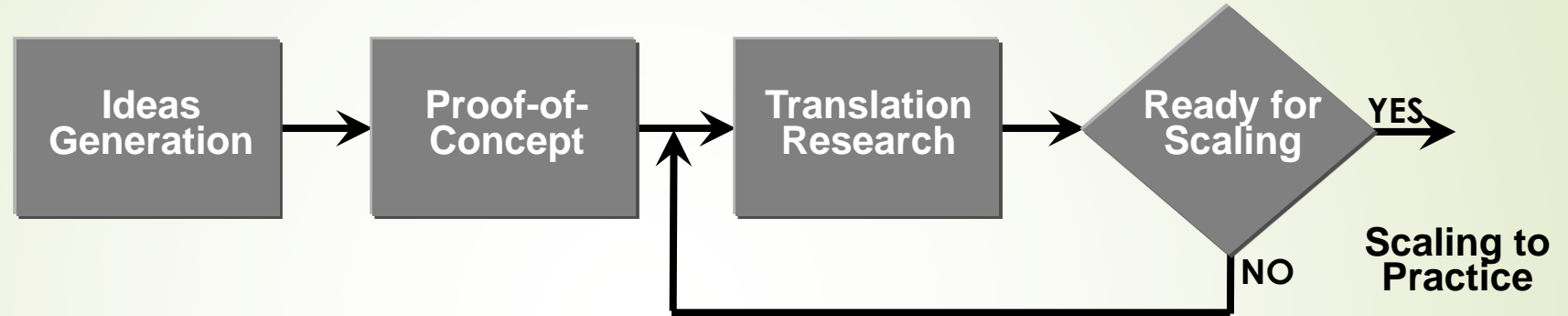


- ▶ mp3 is a focus on bringing about effective pedagogical practices on the ground.
 - ▶ What are the support, activities, resources, incentives etc needed?

From Ideas to Practice



Ideas Generation & Translation



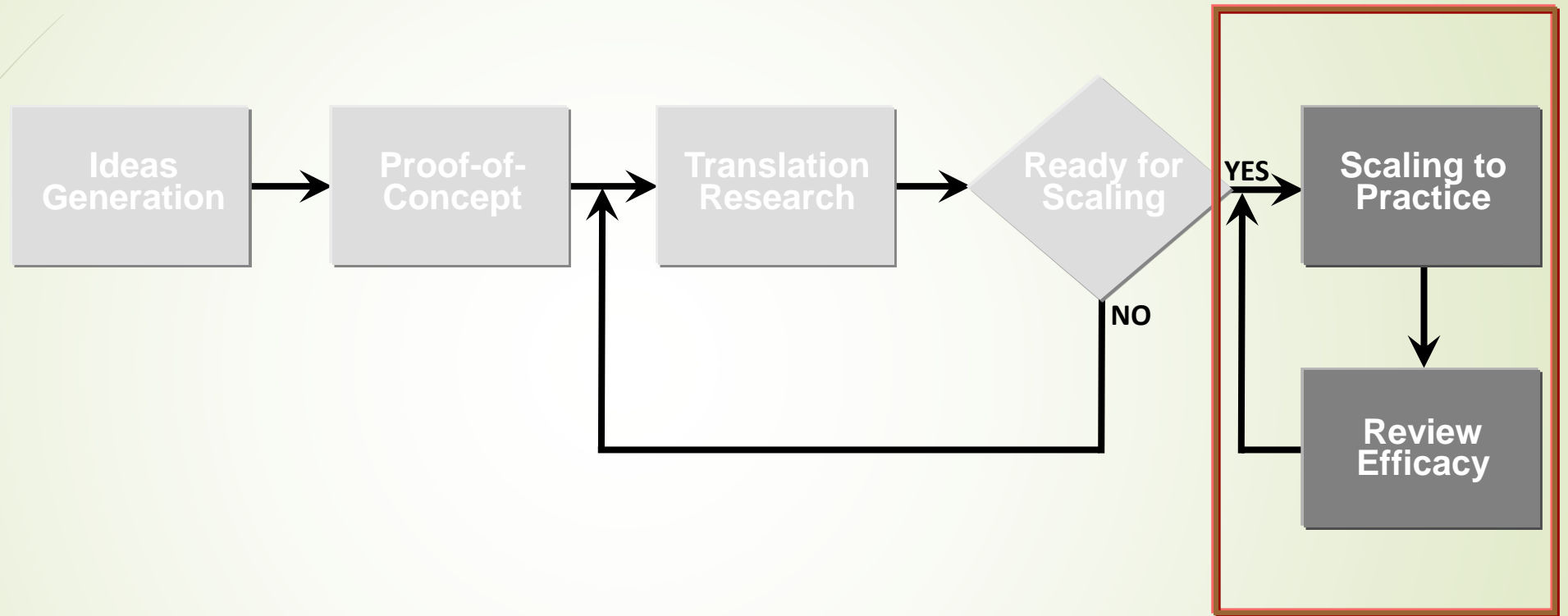
IHL Research

EduLab

FutureSchools

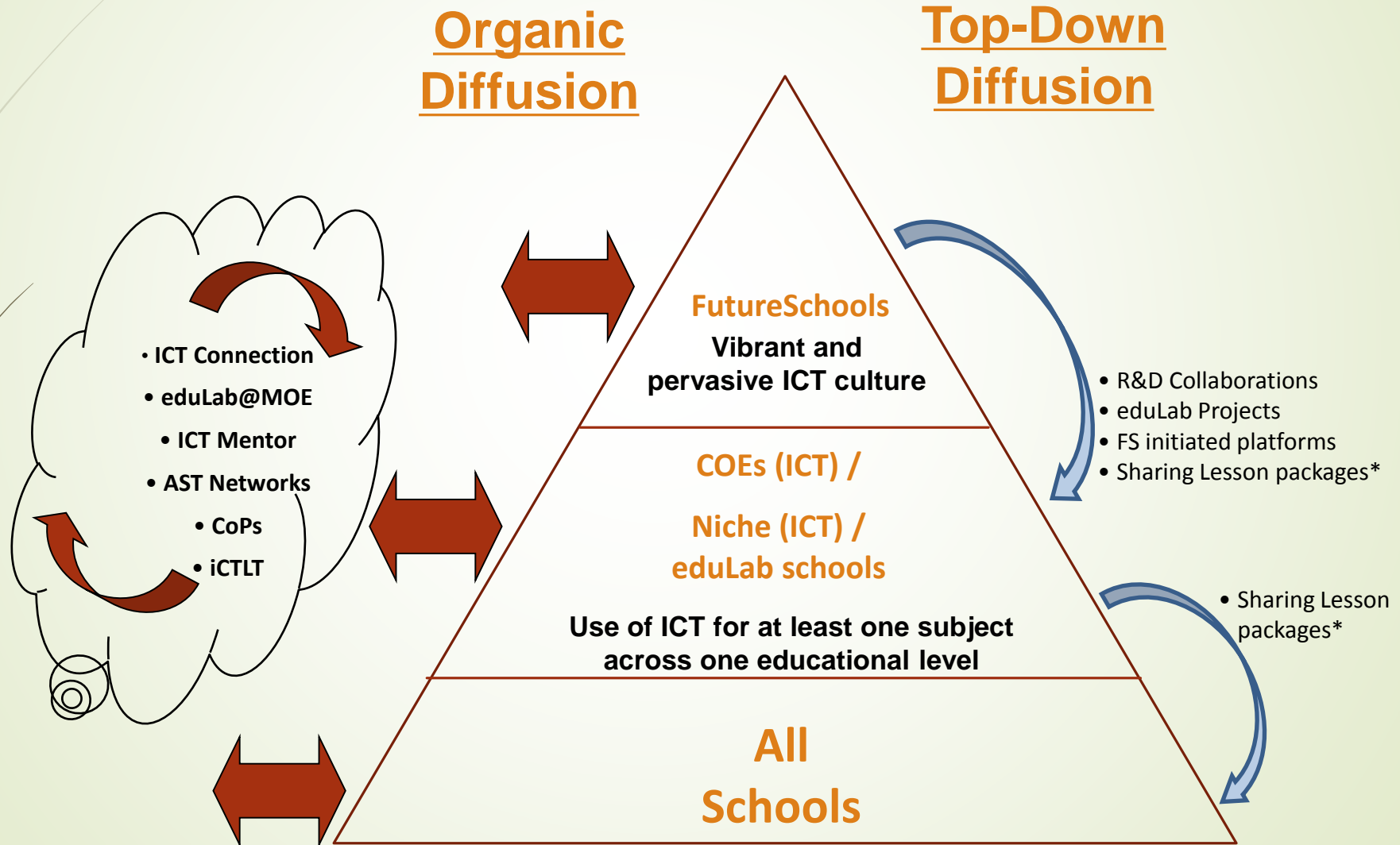
Propel-T

Spreading of Practice to System

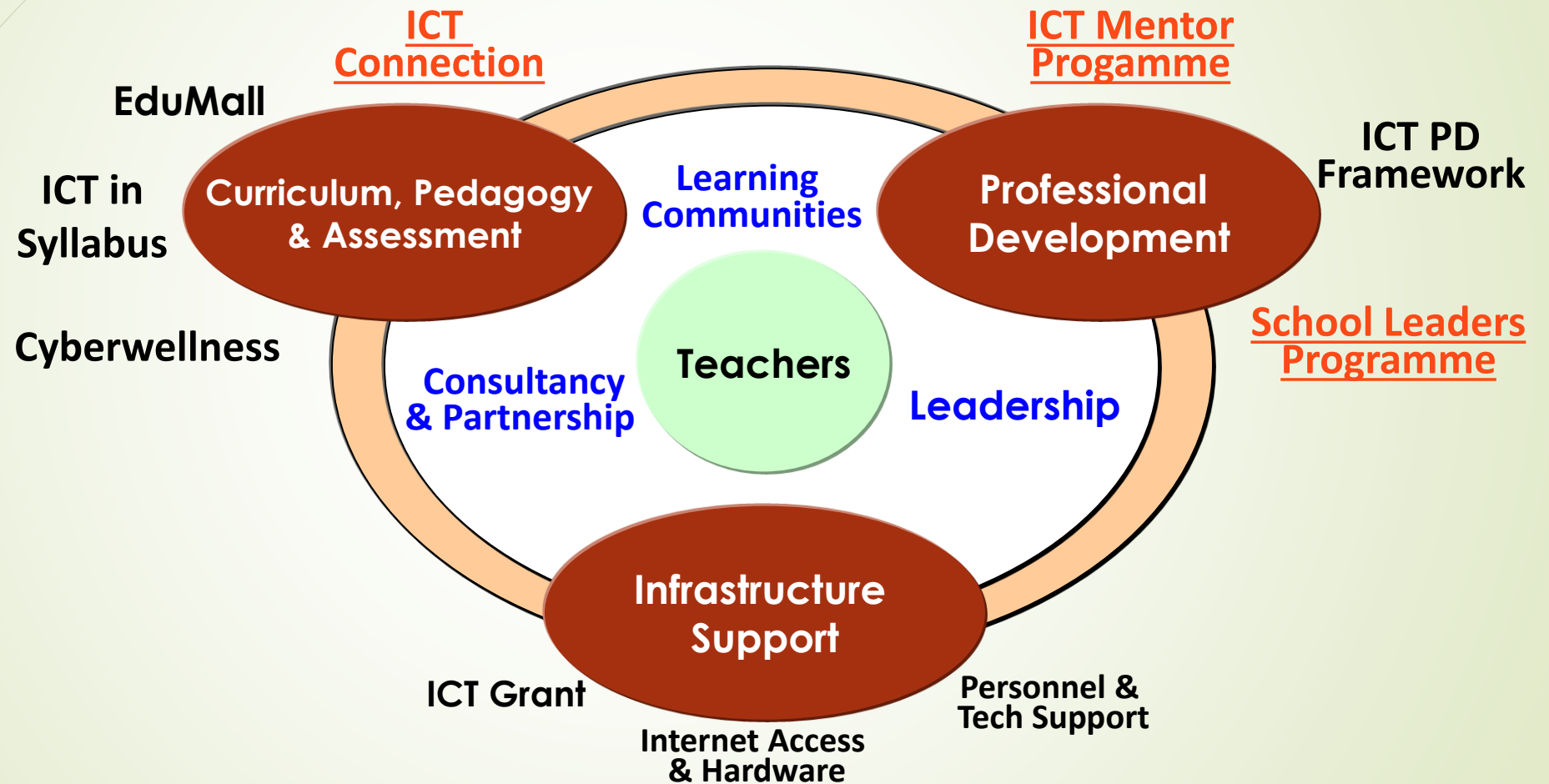


- Scaling – Not duplication
 - Practice can differ depending on context, but same 'kernel'.

Framework for Scaling



Support Structure for Scaling





Singapore: Adaptive Success Factors

- ▶ 3 points to bear in mind
 - ▶ 'Success' factors are intertwined – similar to interdependence of policies
 - ▶ Policies for each factor need to adapt to changing context
 - ▶ These factors permeate throughout the 3 ICT masterplans for Education
- ▶ Five key 'success' factors
 - ▶ 'Human' infrastructure
 - ▶ Ideas generation
 - ▶ Ideas interactions & translation
 - ▶ Support structures
 - ▶ Physical infrastructure

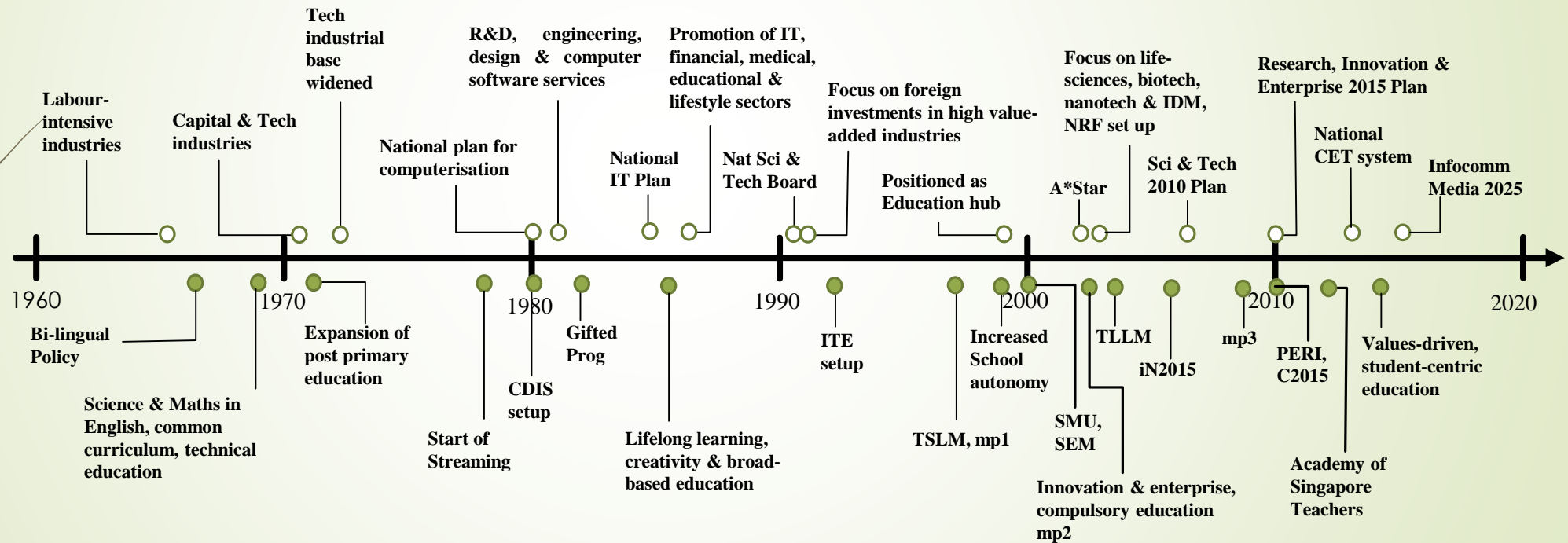


Concluding Remarks

- ▶ Centralised planning/support plus ground exercising of judgement
- ▶ Need to re-examine framing of learning pathways
 - ▶ Life-long engagements
 - ▶ Diverse sources of VSK
- ▶ Given 'connectedness' era
 - ▶ Develop mindset for evidence-based discourse
- ▶ ICT in education
 - ▶ 'transfer' vs 'deepening'
 - ▶ Gain some, lose some – need to know if we can afford the loss



Lock-step development in Education, Manpower and Economic Policies



21st Century Skills Framework



MOE's Cyber Wellness Framework



- Syllabus document:
<http://www.moe.gov.sg/education/syllabuses/character-citizenship-education/files/2014-cyber-wellness.pdf>



MOE's Cyber Wellness Framework

- ▶ 2 principles, 3 ideas & 4 themes
- ▶ Principles
 - ▶ Respect for self and others
 - ▶ Safe & responsible use
- ▶ Ideas & themes
 - ▶ Identity – (a) healthy self identity; and (b) balanced life & balanced use
 - ▶ Relationship – safe & meaningful
 - ▶ Choices – Positive presence





R&D in Institutes of Higher Learning

- ▶ Funding for universities and polytechnics aimed at promoting innovations in the use of ICT for Teaching & Learning.
 - ▶ Develop/Customise technologies
 - ▶ Pedagogically sound use of existing technologies
 - ▶ Test-bedding in schools
- ▶ Selected research areas:
 - ▶ Mobile learning
 - ▶ Augmented reality
 - ▶ Learning analytics
 - ▶ Knowledge-building





EduLab: Capturing Ground Practices

- ▶ Features
 - ▶ Start from tested ideas in small scale context, eg. one classroom
 - ▶ Provide pedagogical & resource support to extend ideas to larger context, eg. whole level/school or several schools
- ▶ Typical model
 - ▶ 2 yr, small scale
 - ▶ Involve up to 5 schools per idea
 - ▶ Collaborate with IHLs and Industries where applicable
- ▶ Expected Outcomes
 - ▶ Pedagogical principles
 - ▶ Lesson packages
 - ▶ Applications & tools where possible





FutureSchool Programme

- ▶ Space to explore cutting-edge use of ICT for Teaching & Learning
- ▶ Characteristics
 - ▶ Headquarter (HQ)-guided school-wide innovations
 - ▶ School-IHL-Industry collaboration supported by HQ
 - ▶ Typical duration – 5 years
- ▶ Outcomes
 - ▶ Automated essay-marking
 - ▶ Augmented learning trails
 - ▶ Key conduit for scaling





Propel-T

- ▶ Small, HQ-led experimentation based on emerging & anticipated trends
 - ▶ Complement school-based efforts
 - ▶ Setting direction at system level
- ▶ 3 focal areas:
 - ▶ 1:1 computing: social-constructivist approach to co-design lessons with 1:1 computing environment
 - ▶ AfL: Apply Assessment for Learning principles in using automated marking tools
 - ▶ CSCL: Use of Wiki & Knowledge Forum for T&L





ICT Mentor Programme

4 Mentors: 1 School

ICT Mentor Basic Course

- Design ICT facilitated SDL & CoL Lesson
- Coaching

ICT Mentor Subject Based Communities

- Deepen ICT-pedagogy in subject disciplines





School Leaders' Programme

- Strengthen capability to incorporate ICT in education
- Peer-led/facilitated seminars & workshops
 - Sharing of practices
 - Demonstration of practices
 - Experience actual T&L interactions using ICT
- Learning journeys
 - Deep engagement in actual practice
- Lectures & seminars by thought-leaders





ICT Connection

- ▶ Channel of communications for mp3
- ▶ Illustrate meaningful use of ICT for Self-Directed and Collaborative Learning
- ▶ Co-creation of 'lesson packages'
 - ▶ HQ works with school teachers
 - ▶ Greater ownership
 - ▶ Packages are used in actual teaching and learning
- ▶ Sharing & adaptation of 'lesson packages'





Success Factor – Human Infrastructure

- ▶ mp1
 - ▶ Focus on ICT skills
 - ▶ Trained via centralised ‘train-the-trainers’ model
 - ▶ Paid PD for teachers
- ▶ mp2
 - ▶ School-based ICT planning
 - ▶ Baseline ICT standards
 - ▶ ICT exposure for school leaders
- ▶ mp3
 - ▶ School leaders’ programme
 - ▶ Subject chapters for teachers
 - ▶ ICT Professional development framework





Success Factor – Ideas Generation

- mp1
 - Institutional R&D
 - Centralised purchase & development of resources
- mp2
 - 'Lead' ICT schools to encourage grounds-up practices
 - Increased funding for R&D
 - Industrial involvement in ideas generation/development
- mp3
 - EduLab, FutureSchools
 - School-based R&D
 - Propel-T





Success Factor - Ideas Interactions & Translation

- ▶ mp1
 - ▶ Basic sharing – large proportion centrally organised
- ▶ mp2
 - ▶ Sharing structures – WeShare, iShare
 - ▶ International conferences
- ▶ mp3
 - ▶ EduLab, FutureSchools, ICT Connection
 - ▶ Academy of Singapore Teachers network
 - ▶ Community of practice, school cluster sharing
 - ▶ Monographs, school-based publications





Success Factor – Support Structures

- ▶ mp1
 - ▶ EduMall – centrally procured/developed software & resources
 - ▶ Syllabus reduction (up to 30% for each discipline)
- ▶ mp2
 - ▶ School autonomy – devolved ICT funds
 - ▶ Cluster Educational Technology Officers to support schools
 - ▶ By(i)tes 2.0 – tool for self-evaluation
- ▶ mp3
 - ▶ 4 ICT mentors per school
 - ▶ ICT in curriculum; Frameworks – eg. 21st CC, cyberwellness





Success Factor – Physical Infrastructure

- ▶ mp1
 - ▶ Computer labs in schools
 - ▶ Basic broadband
- ▶ mp2
 - ▶ School choose Learning Management System
 - ▶ Wireless network
- ▶ mp3
 - ▶ Pedagogy-led development
 - ▶ ICT grant
 - ▶ Enhanced broadband – schools can add further bandwidth if justified





THANK
YOU!