



Digital Ethics and Data Privacy

Topic 7: Digital Divide, Equity, Accessibility and Inclusion



Topic Objectives

- Understand the concepts of ***digital divide, equity, accessibility, and inclusion***.
- Discuss the ***societal implications*** of the digital divide and the ***role of technology*** in addressing it.
- Explore ***strategies*** for promoting equity, accessibility, and inclusion in the field of computing.
- Identify ways to shape an ethical, diverse, inclusive and equitable form of education through more meaningful and engaging ***social experiences*** within digital environments or in hybrid online/offline spaces

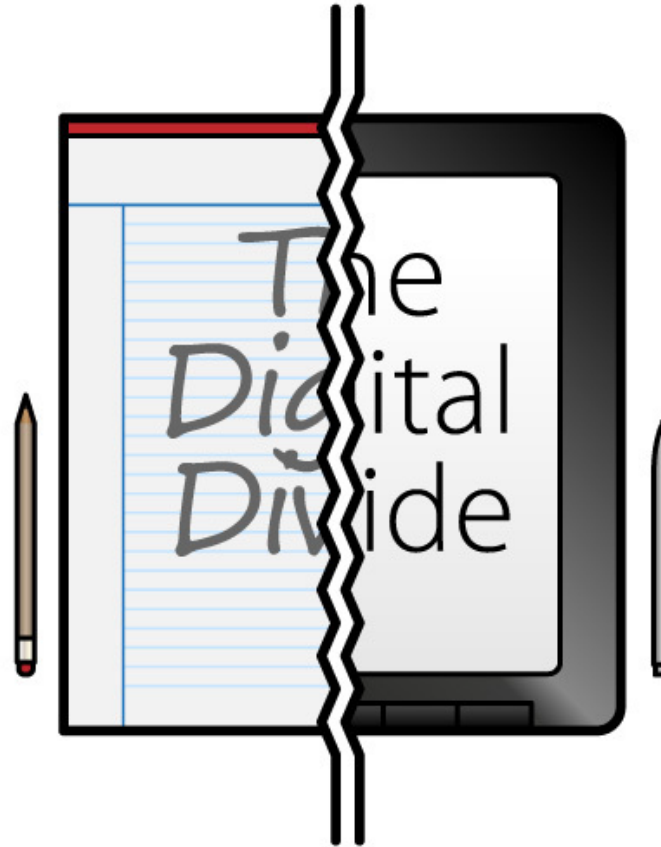
Digital Divide

Growing Gap Between

**No or little access to
computers or the
internet**

Underprivileged
Poor
Rural
Elderly
Handicapped

**Lack of digital skills
and knowledge**



**Have access to
computers or the
internet**

Wealthy
Middle-class
Young
Urban
Suburban

**Proficient digital
skills and knowledge**

JAN
2024

ESSENTIAL DIGITAL HEADLINES

OVERVIEW OF THE ADOPTION AND USE OF CONNECTED DEVICES AND SERVICES



TOTAL
POPULATION



8.08
BILLION

URBANISATION

57.7%

we
are
social

UNIQUE MOBILE
PHONE SUBSCRIBERS



5.61
BILLION

vs. POPULATION

69.4%

Meltwater

INDIVIDUALS USING
THE INTERNET



5.35
BILLION

vs. POPULATION

66.2%

KEPIOS

SOCIAL MEDIA
USER IDENTITIES



5.04
BILLION

vs. POPULATION

62.3%

Why Do We Go Online?

DIGITAL 2024: GLOBAL OVERVIEW REPORT

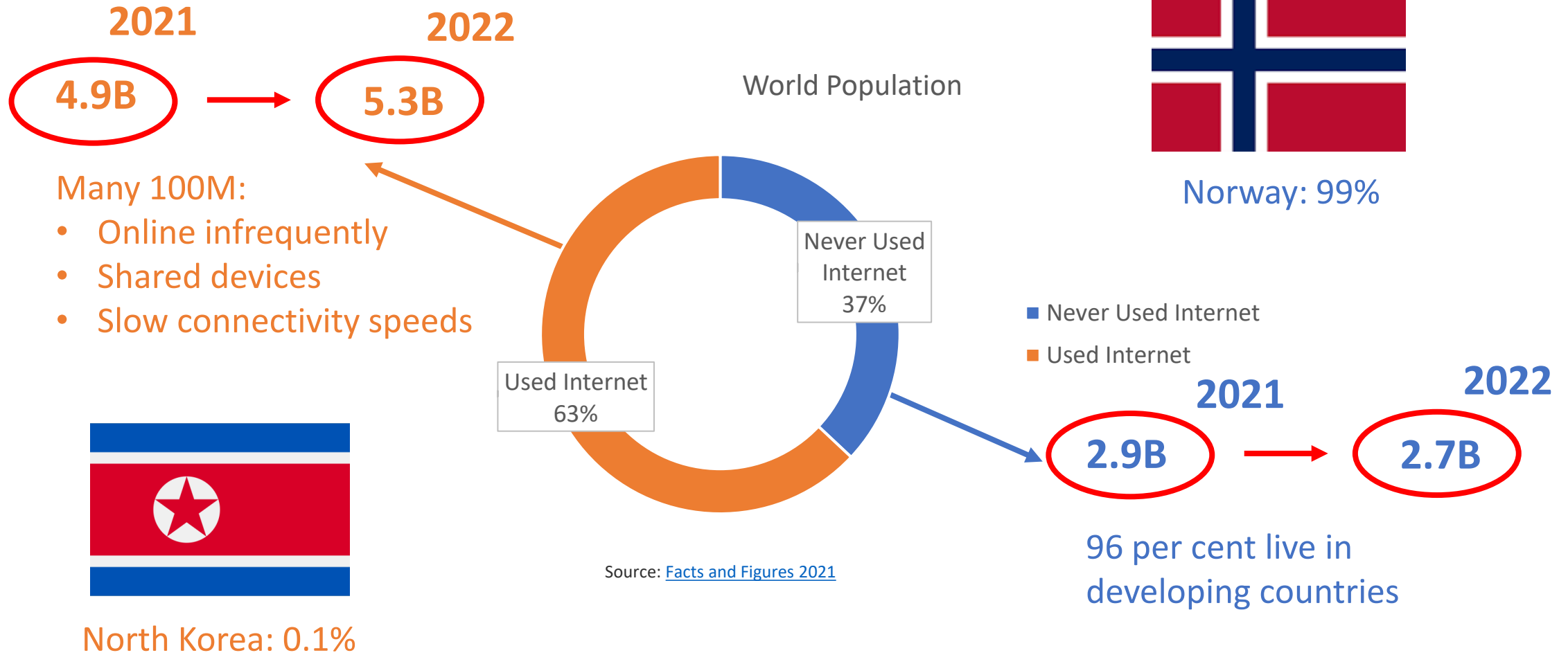
- Top Reasons for Using The Internet:
 - Finding Information [60.9%]
 - Staying in touch with Friends and Family [56.6%]
 - Watching Videos, TV Shows or Movies [52.3%]
 - Keeping Up to Date With News and Events [51.9%]
 - Researching How to Do Things [49.4%]
- Top Reasons for Using Social Media:
 - Keeping in touch with Friends and Family [49.5%]
 - Filling Spare Time [38.5%]
 - Reading News Stories [34.2%]
 - Finding Content (e.g. articles, videos) [30.2%]
 - Seeing What's Being Talked About [28.7%]

[Digital 2024: Global Overview Report — DataReportal — Global Digital Insights](#)

“Content isn’t king. If I sent you to a desert island and gave you the choice of taking your friends or your movies, you’d choose your friends – if you chose the movies, we’d call you a sociopath. Conversation is king. Content is just something to talk about.”

Cory Doctorow

2.7 billion people still offline (end 2022)



A satellite night image of North Korea and surrounding regions. The image shows the Korean Peninsula with North Korea appearing very dark due to limited electricity, while South Korea is brightly lit. Labels include China, North Korea, Pyongyang, Seoul, South Korea, Gunsan, Yellow Sea, and Bo Hai Gulf. The title 'Internet Black Hole' is overlaid on the left side.

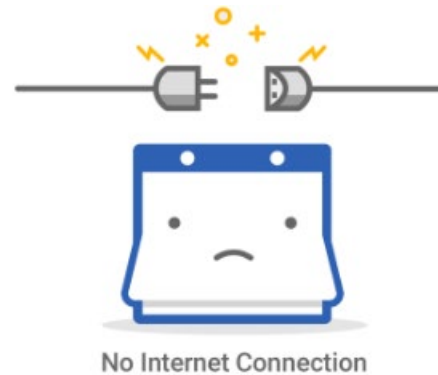
Internet Black Hole

A satellite image of North Korea in 2014. The country is barely visible at night due to its limited electricity. *Image source:* [NASA](#)

Why the Digital Divide is Detrimental



Job Opportunities



Internet Connection



Education

What is Digital Equity?

- The condition wherein all individuals – regardless of their ethnicity, race, socio-economic class, gender, or disability status – have equal access and opportunity to use digital tools, services, and resources to increase their digital awareness, knowledge, and skills.
 - The International Society for Technology in Education



EMPLOYMENT



**LIFELONG
LEARNING**

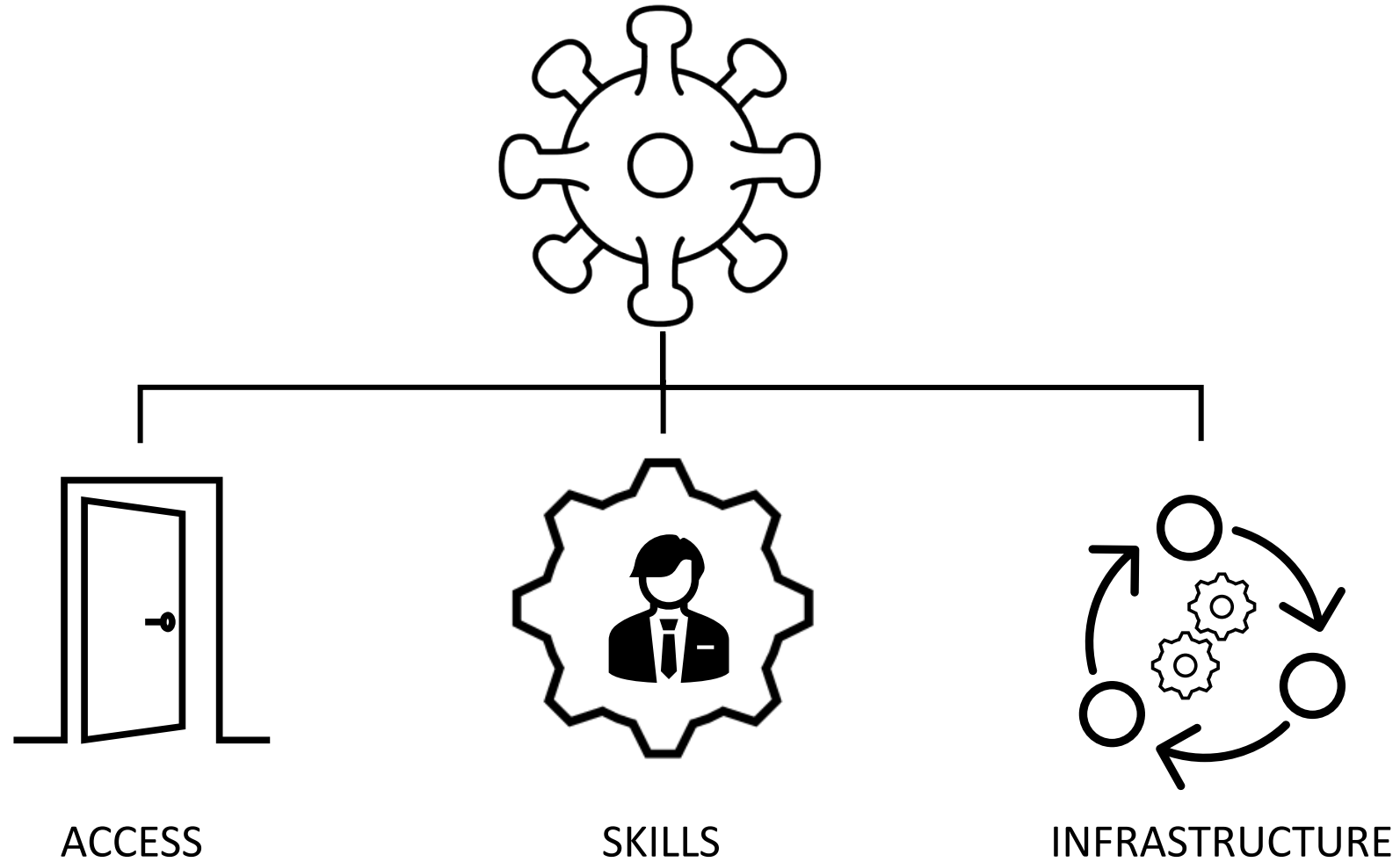


**ACCESS TO
ESSENTIAL
SERVICES**



**GOVERNANCE &
CIVIC
PARTICIPATION**

Inequity Amplification By COVID



Digital Gaps in Singapore

Covid-19 affects poor families disproportionately



Physical Environment



Parental Skills



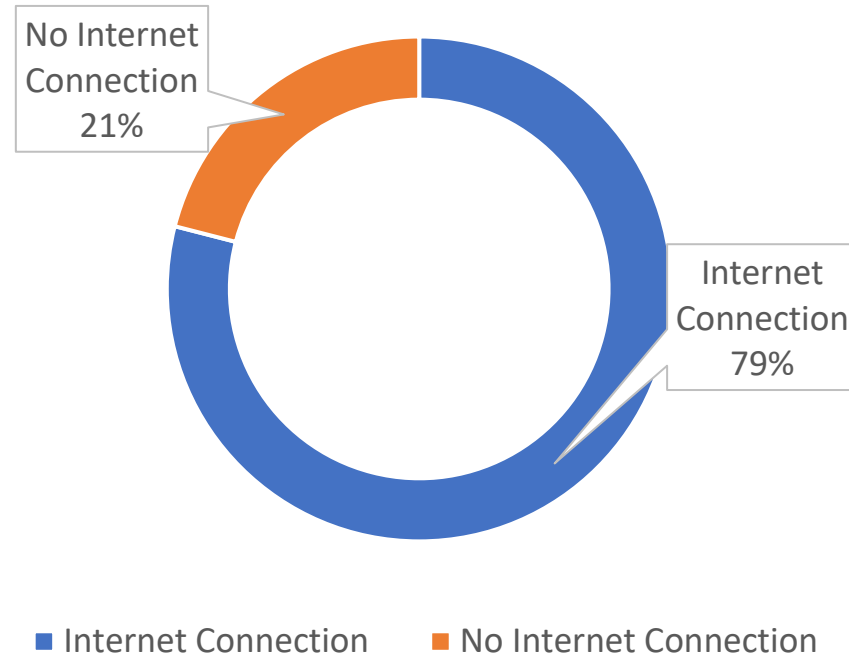
Connectivity Issues



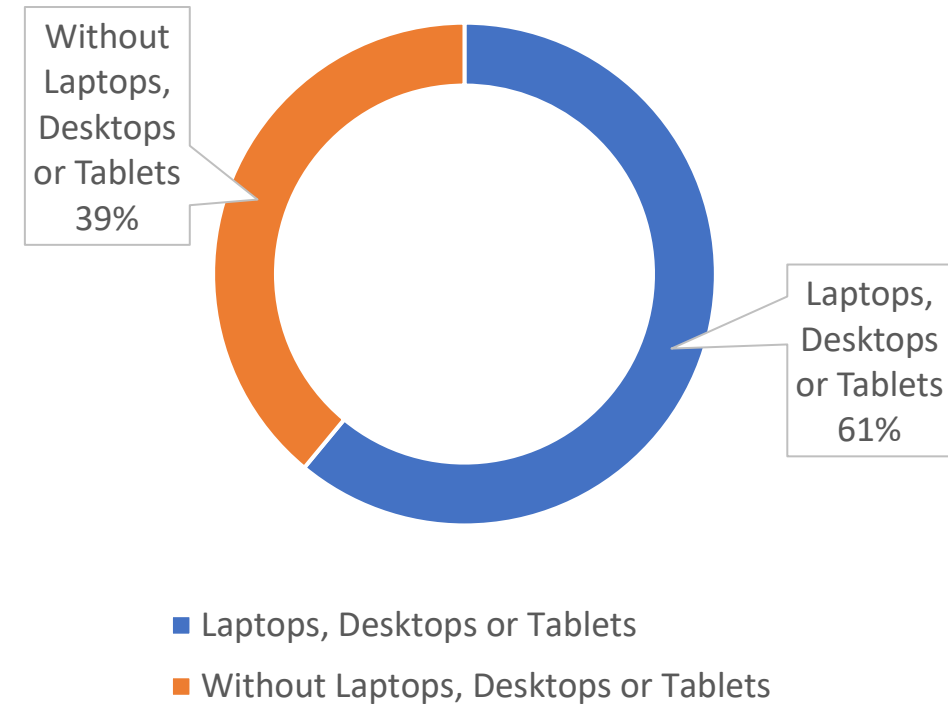
Availability of devices

Profiling Survey of 573 Households

Internet Connection in Low-income Households



Devices in Low-income Households



Source: Straits Times Article: [Why digital poverty deserves greater attention](#)

National Programmes

- IMDA Digital Access Programme

SG:D | GET READY!
NEU PC PLUS



SG:D | GET READY!
HOME ACCESS

Benefitted
83,000
individuals

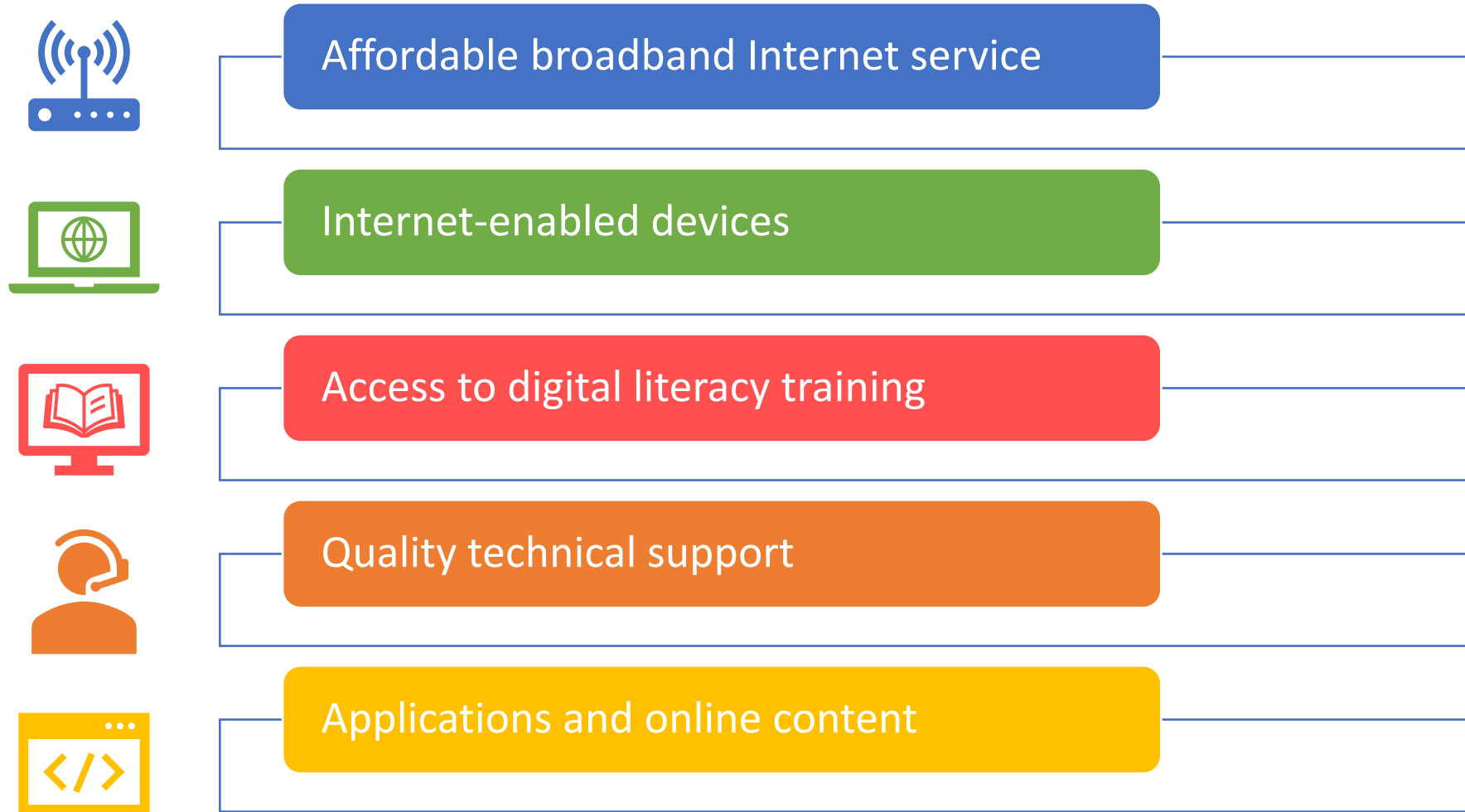
Low Take-up Due To:

1. Unaware of these digital support programmes
2. Does not meet criteria of 1 laptop per household
3. Deterred by stringent conditions and paperwork / stigma
4. Chicken-and-egg problem
 1. People who do not own PCs do not see need
 2. People who do not see the need do not own PCs

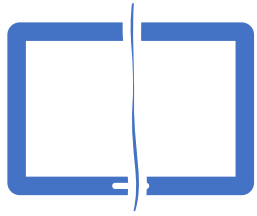
2 New Initiatives



Digital Inclusion



Promoting Digital Equity



**Acknowledge the
Digital Divide**



**Provide Digital
Skills Training to
Low-Income
Population**



**Improve Online
Accessibility of
Social Services for
the Disadvantaged**



**Empower Low-
Income Households
with Digital Tools
and Internet Access**

WWW.SG: Active and Engaged Citizenry



Persons with Disabilities

Sometimes the government does too much for the people. Singaporeans are spoilt as the government always thinks for them, and they don't need to worry. But if there are problems, they get unhappy and complain. I think we should challenge ourselves to be people who solve problems.



Family Violence

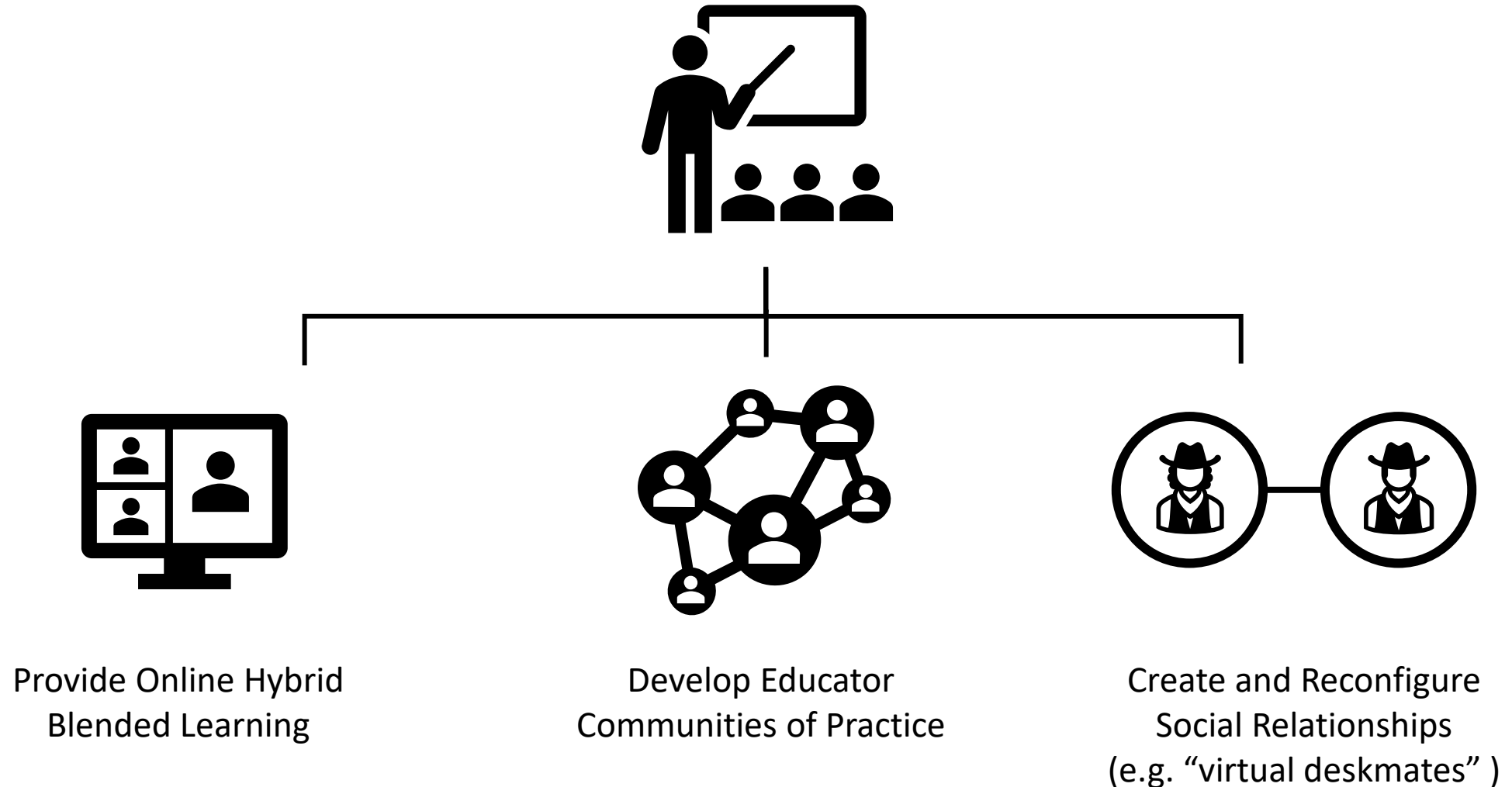
If we compare our government with others, ours has done a really good job. As Singaporeans, we also need to ask ourselves what can we do to help the country, instead of asking the government for everything? We always hear that the government should do this and that, then when something goes wrong, we blame it on the government.



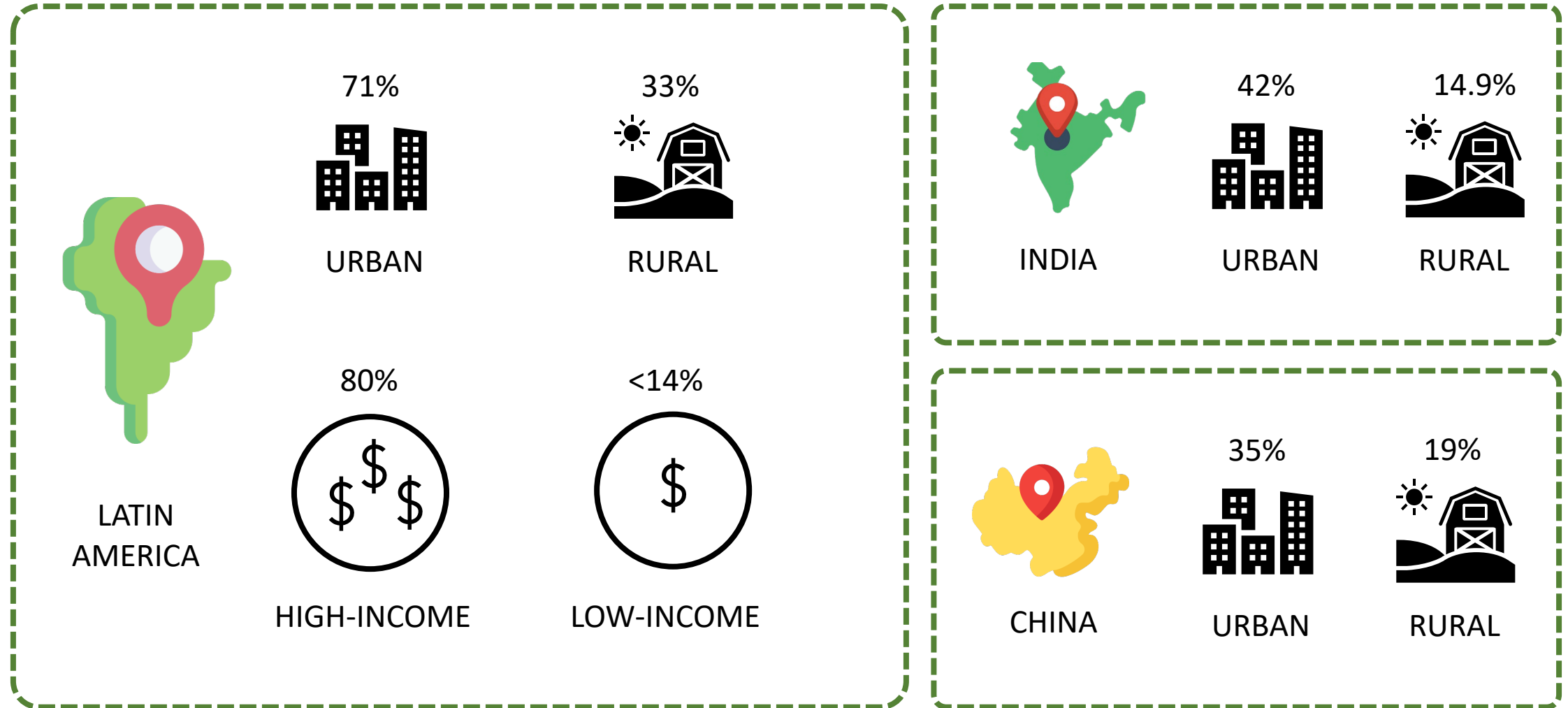
Youth Mental Well-Being Network

The government needs to explain trade-offs and different approaches to the solution. People will accept that it is a judgment call, but want to know what was considered.

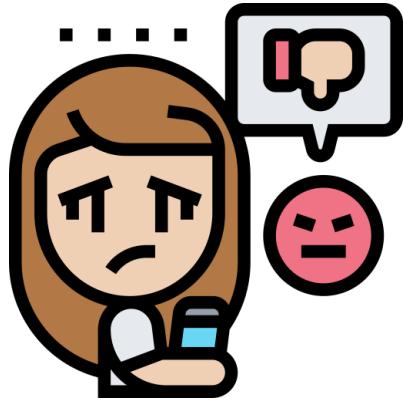
Redesigning Online Education



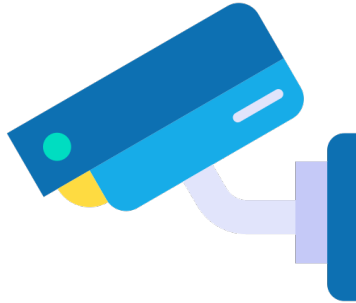
Accessibility Disparities



Risks from Increased Online Time



Cyberbullying

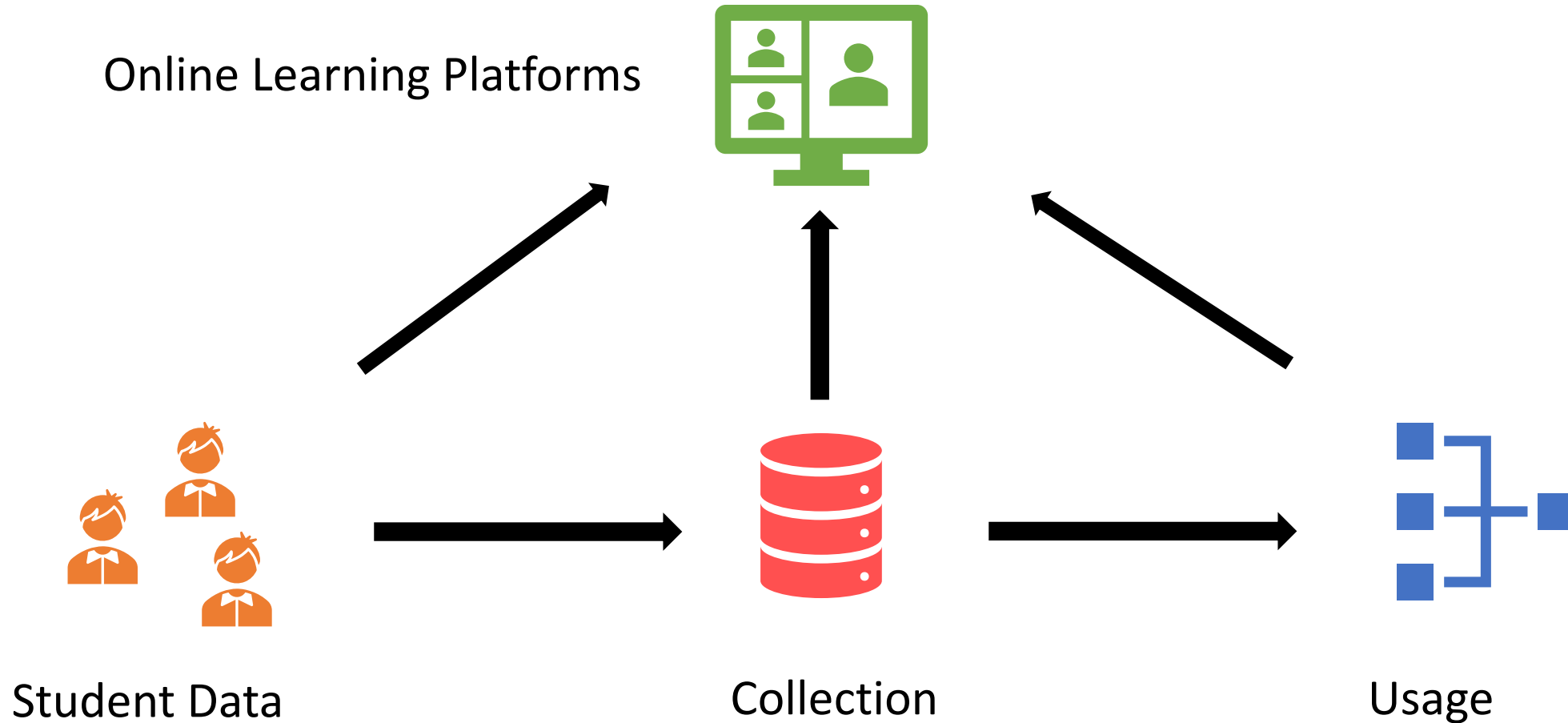


Surveillance



Opaque Decision-Making

Security and Privacy Issues



Supervision or Surveillance?

SUPERVISION:

Watching over for the purpose of guidance, which includes a component of care

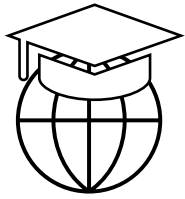


Image Source: online.usm.edu

SURVEILLANCE:

Connotes continual or continuous watching, usually involving close observation and scrutinization of behavior.

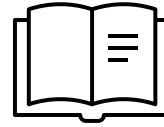
Blended Collaborative Digital E-Learning



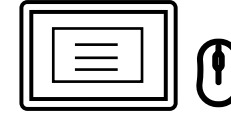
Global
Education



Video
Lesson



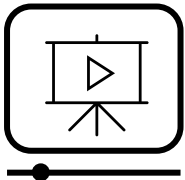
Online
Reading



E-Learning



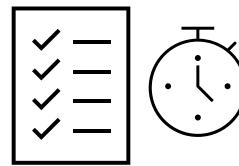
Online
Class



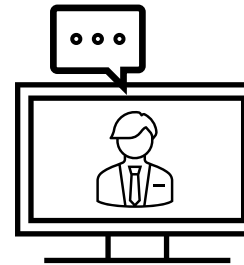
Online
Tutorials



Webinar



Quiz



Online
Consultation



Award

Usability Gap

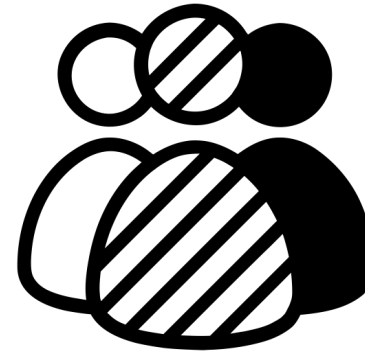
- Marginalized Communities



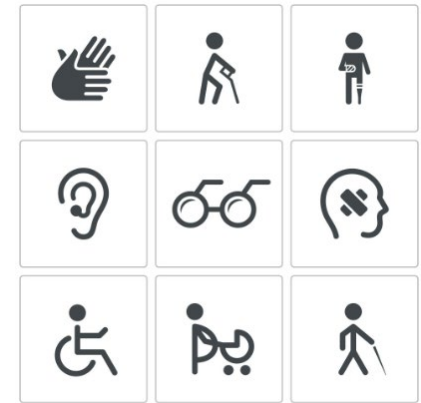
Rural Population



Older Population



Ethnicity



Disability

E-Inclusion – Bridging The Gap In Businesses



Diverse and Inclusive Team



Design for Everyone



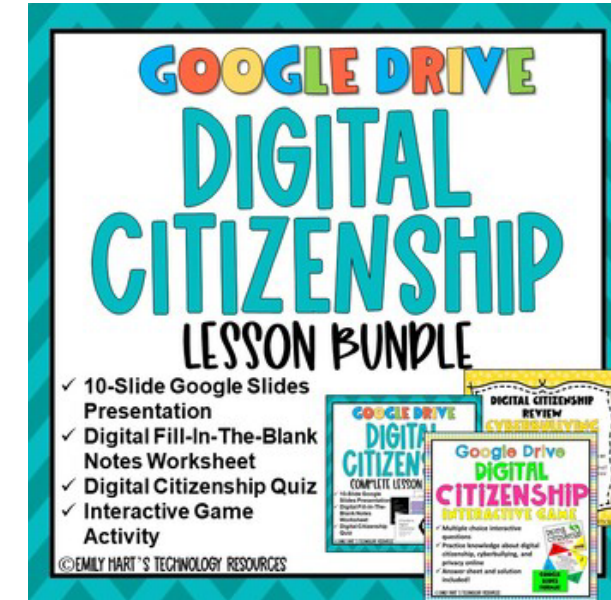
Diverse Focus Groups

How Tech Companies Help Bridge The Gap

- Google's 'Be Internet Awesome' initiative (2017)



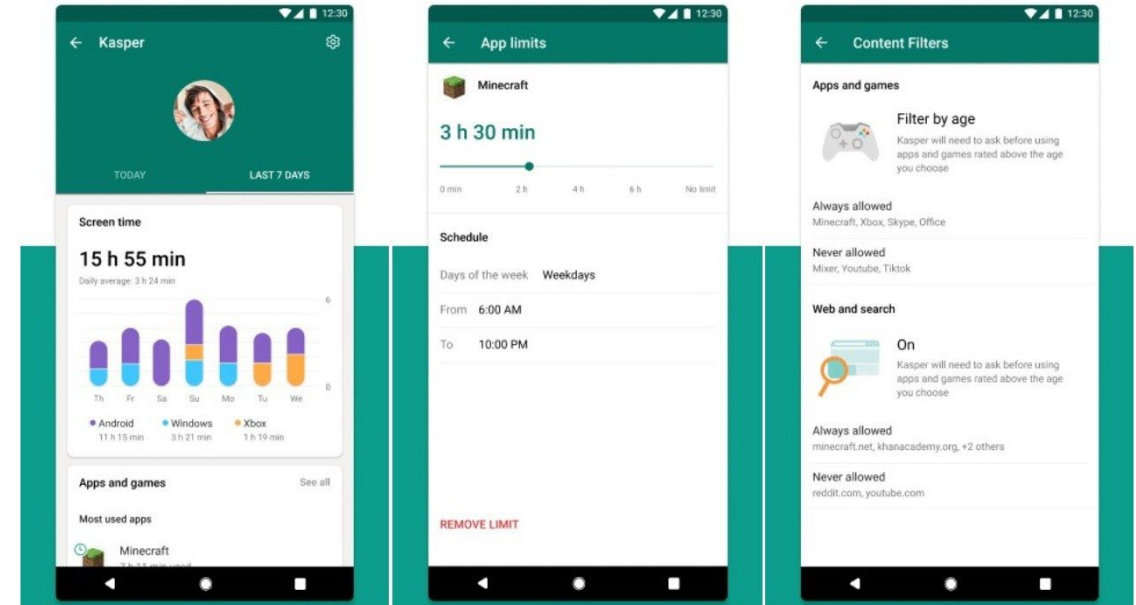
Interland, a game-based learning platform that teaches children how to manage privacy, recognize online threats, and act responsibly in digital environments.



Digital citizenship lessons and family guides that promote safe internet practices at home.

How Tech Companies Help Bridge The Gap

- **Microsoft's Family Safety App (2020)**



Microsoft's Family Safety app offers parents a range of tools to manage their children's screen time, monitor their online activities, and keep them safe in today's digital environment.

The app allows you to view family members' activity, limit screen time, and take advantage of content controls.

AI Solutions – Assistive Technologies

speech-to-text
transcription
services



navigation aids



smart wheelchairs



AI Solutions – Personalized Learning

AI Voice Technologies



Learning Opportunities



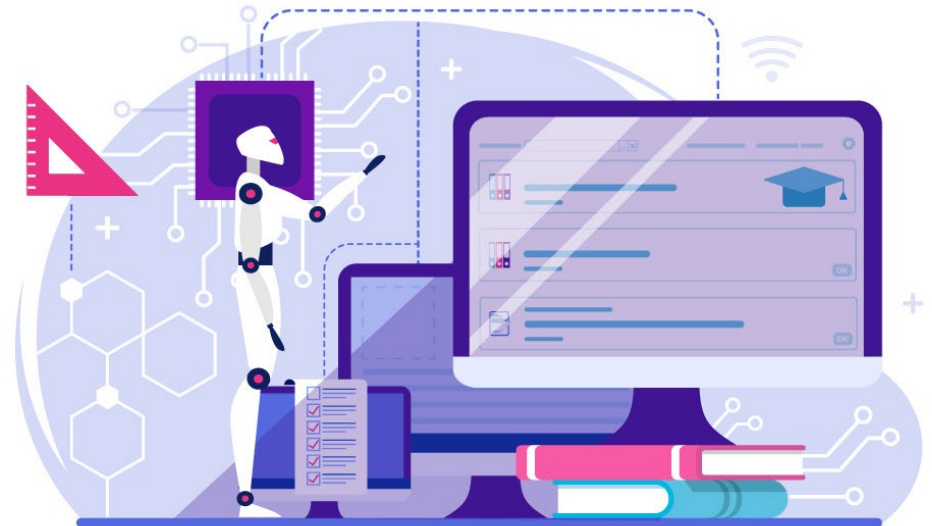
ObjectiveEd's Braille AI Tutor



SPECIAL EDUCATION

AI Solutions – Educational Technologies

- Personalized and smart teaching content.
- Differentiated learning catering to the needs of the students' abilities on a wide spectrum.
- Help teachers focus more on the teaching process, rather than spending time on administrative tasks.
- Efficient school management.
- Better evaluation of students.



AI Solutions – Employment Opportunities



Match disabled individuals with
suitable job opportunities



Create more inclusive
workplaces

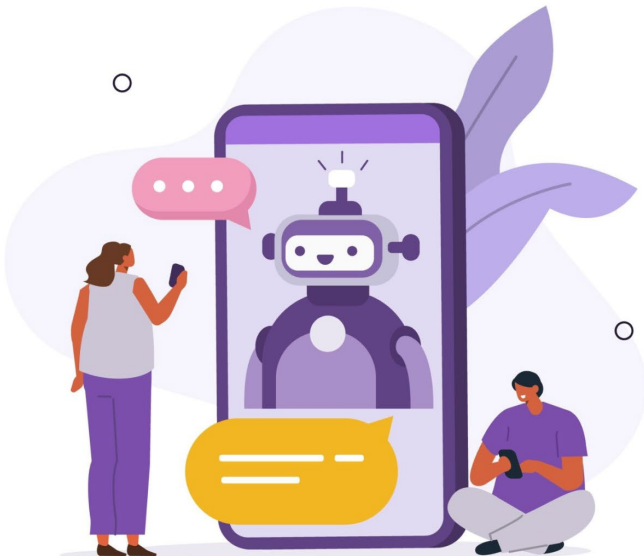
Ethical Concerns with AI-Based Tech

Challenges

1. Bias and Discrimination
2. Privacy Concerns
3. Job Displacement
4. Lack of Accountability

Mitigations

1. Diversity in AI development teams + transparent AI processes
2. Anonymize and encrypt data + strict access controls
3. Reskilling and upskilling programs
4. Robust policies and procedures + regular data usage audits





Q & A





NUS
National University
of Singapore

School of
Computing