數碼公民素養的研究為疫後家·校教育帶來什麼啟示?

What insights have digital citizenship research brought to families and schools after the epidemic?

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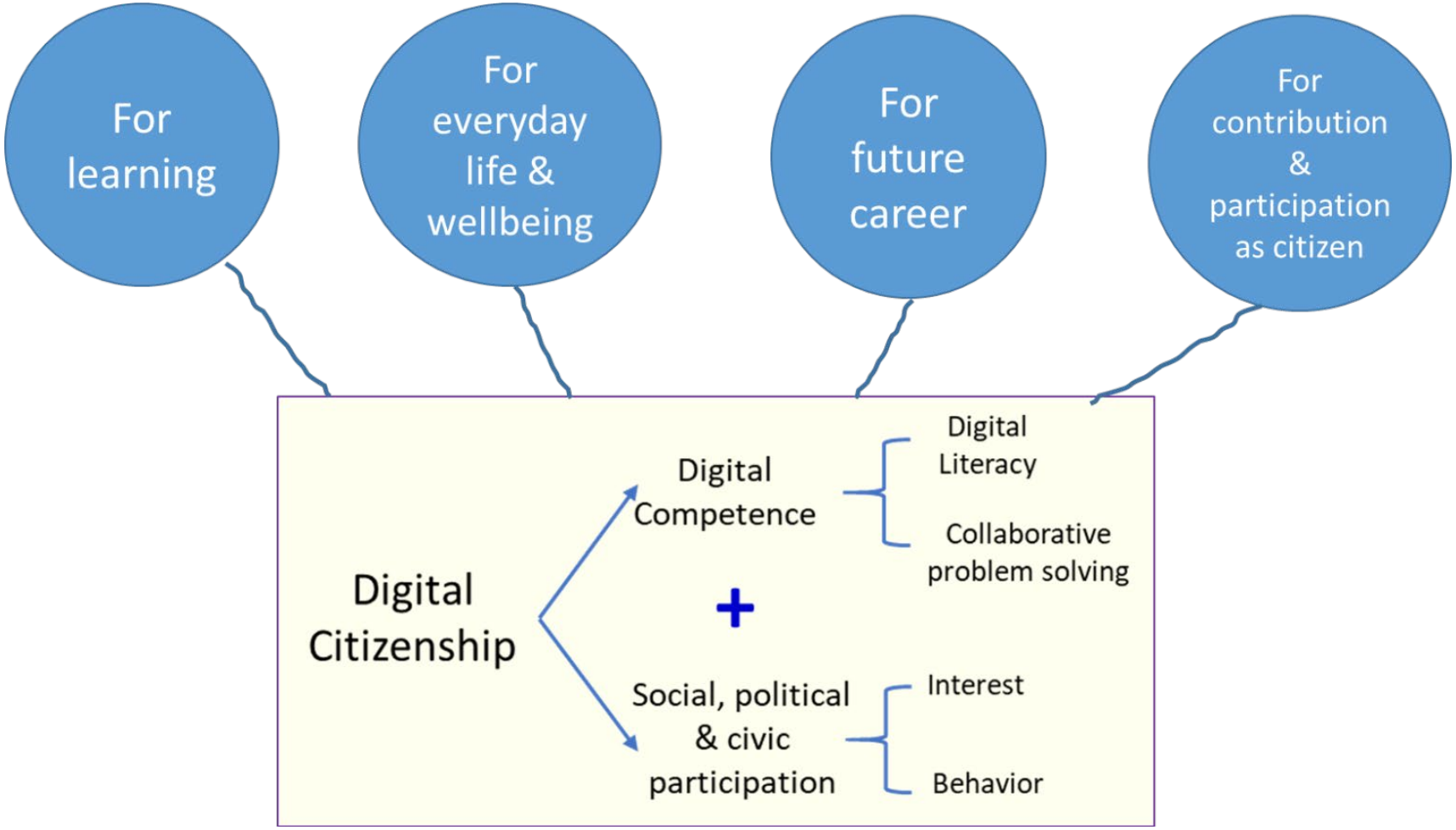
Digital citizenship: what & why?



Genesis of a Sequence of Four Studies

wave-1

(Jan-Jun 2019)

Findings:

- **Students in general only have basic digital literacy (DL)**
- **Huge DL divide within schools and between schools**
- **Access to Large Screen Devices (LSDs) at home vital to DL development**
- **DL predicts students' digital wellbeing (internet addiction, cyberbullying exp)**
- **SES influences students' DL achievement**

wave-2

(Apr – Jul 2021)

Wave-2 is a longitudinal follow-up to track students' growth in digital competence & factors that influence them, as well as how these affect students' wellbeing.

Dates indicated are the time period for data collection

Genesis of a Sequence of Four Studies

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(Jan-Jun 2019)

1st/2nd wave COVID

e360 (2020)

(8 Jun – 12 Jul 2020)

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In view of the serious digital divides revealed in wave-1 findings, an "**emergency action-focused study**" to understand how students, teachers, schools & families are affected by the sudden school suspension.

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Genesis of a Sequence of Four Studies

Learning and Assessment for DIGITAL CITIZENSHIP wave-1

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Learning and Assessment for DIGITAL CITIZENSHIP wave-2

(Apr – Jul 2021)

Wave-2 is a longitudinal follow-up to track students' growth in digital competence & factors that influence them, as well as how these affect students' wellbeing.

5th Wave COVID

e360 (2022)

(Jul – Sep 2022)

How has 3 years of waves of school suspension impacted students' learning, and what are effective strategies to help address the learning gap?

Dates indicated are the time period for data collection

Learning and Assessment for DIGITAL CITIZENSHIP

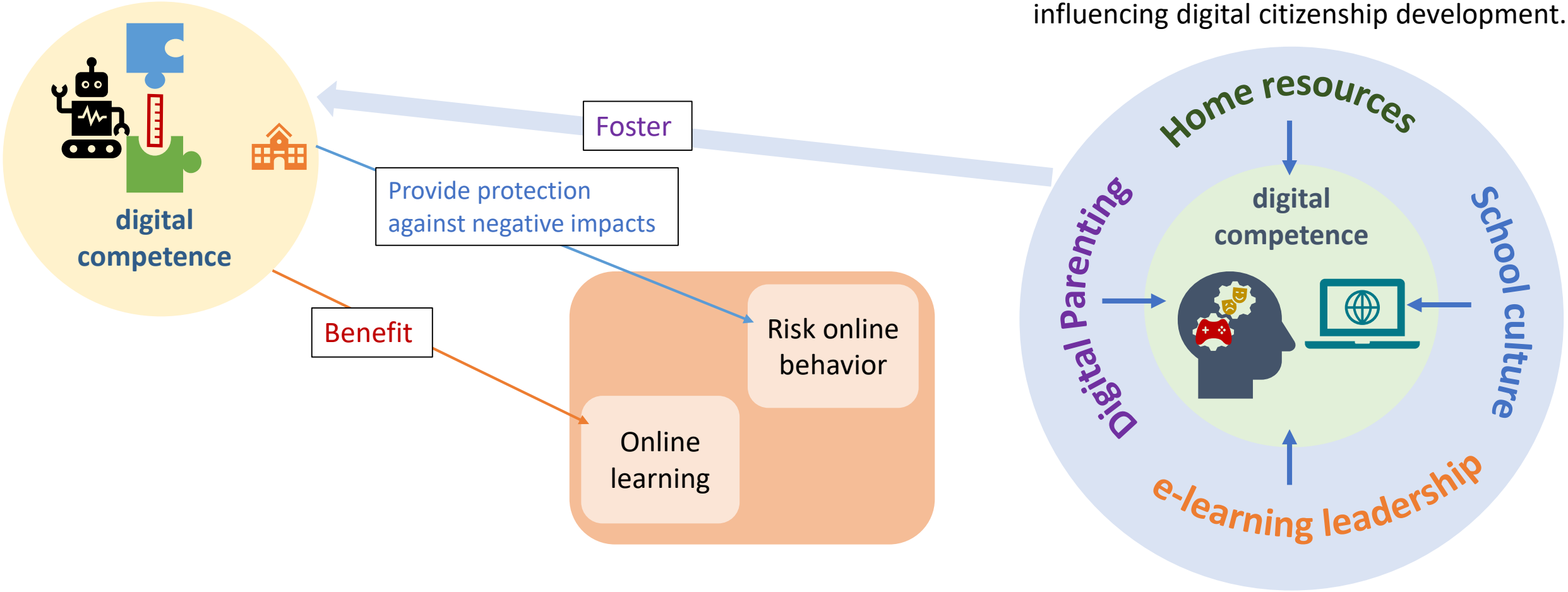
Research Findings

eCitizen Education 數碼素養 360 2022

Finding 1: Serious and increasing digital competence divides within and across schools over time.

Finding 2: Digital competence contributes positively to online learning and protects against online risks.

Finding 3: Home resources, digital parenting, school culture, and e-learning leadership are significant factors influencing digital citizenship development.



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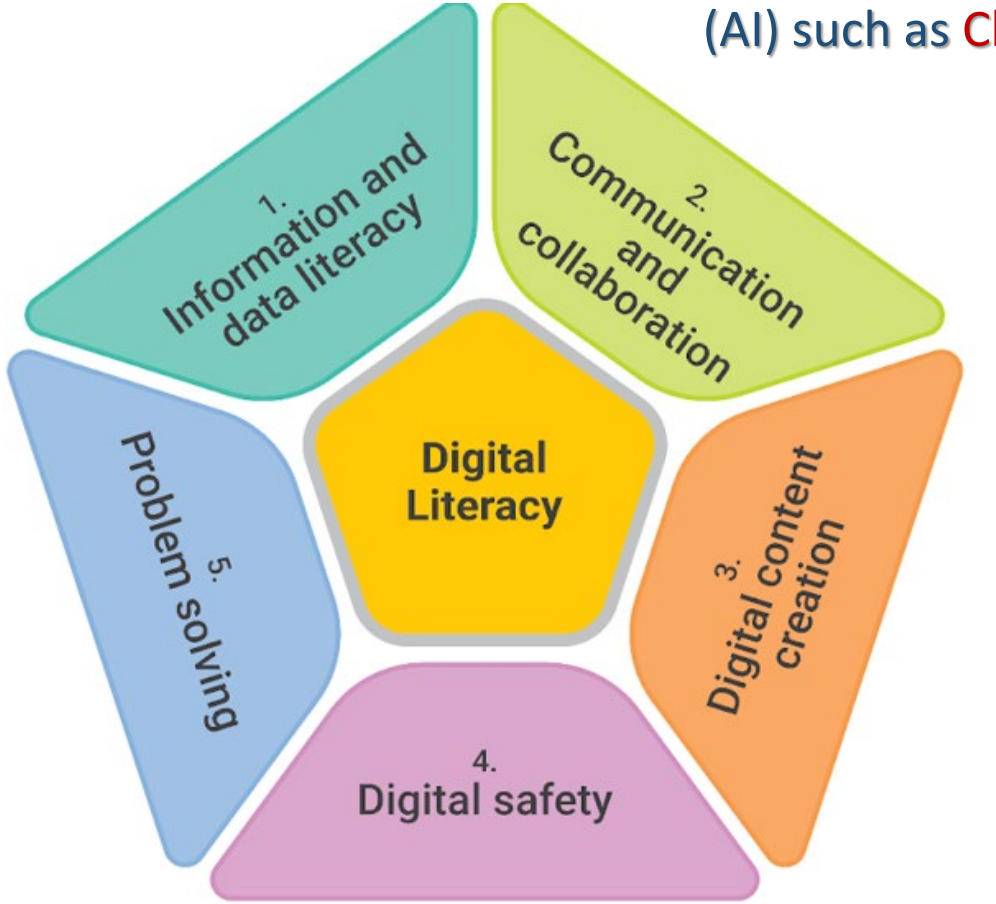
What is Digital Literacy?

Is digital literacy relevant to how to deal with the rapid development of artificial intelligence (AI) such as ChatGPT?



Learning and Assessment for DIGITAL CITIZENSHIP

Digital Literacy and Artificial Intelligence

eCitizen Education 數碼素養 360 2022

How can ChatGPT improve the efficacy of searching?
How to prevent being misled by false information provided by AI?

How can ChatGPT help us use different media to communicate and collaborate for different targets and groups?
How to ensure that the information provided by AI is accurate?

What are the strengths of ChatGPT? Will specialized AI tools improve our work efficiency?
Is the solution provided by AI feasible?
How practical it is?

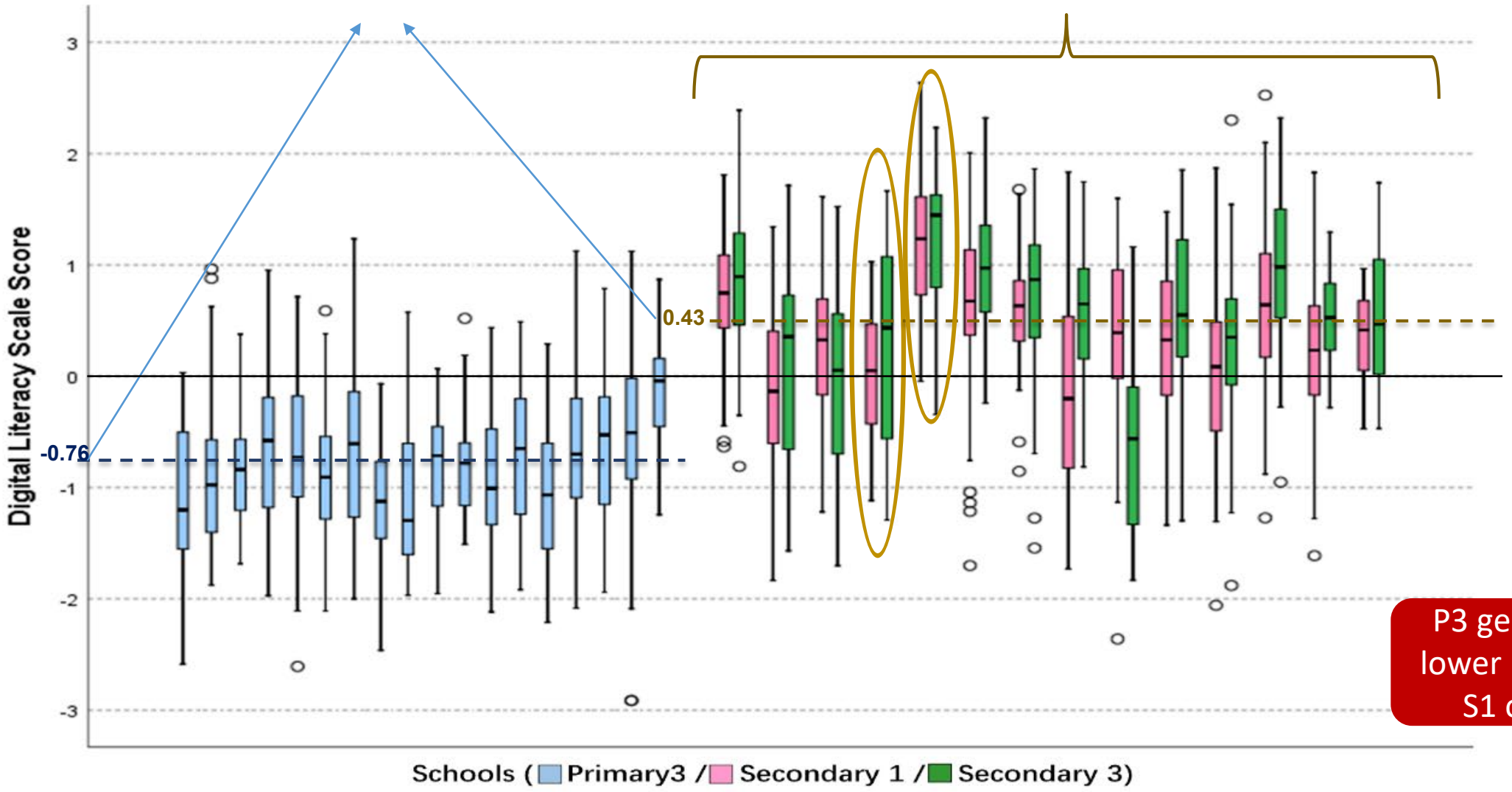
How can ChatGPT improve the quality of our writing? (e.g., rhetoric)
Is the revision of the AI appropriate? Is there any plagiarism?

Who will see conversations between ChatGPT and us?
Where does the database it supports come from?
Is the revision of the AI appropriate? Is there plagiarism?

Digital literacy: 2019 (Wave 1) findings

Secondary students perform significantly better than primary students

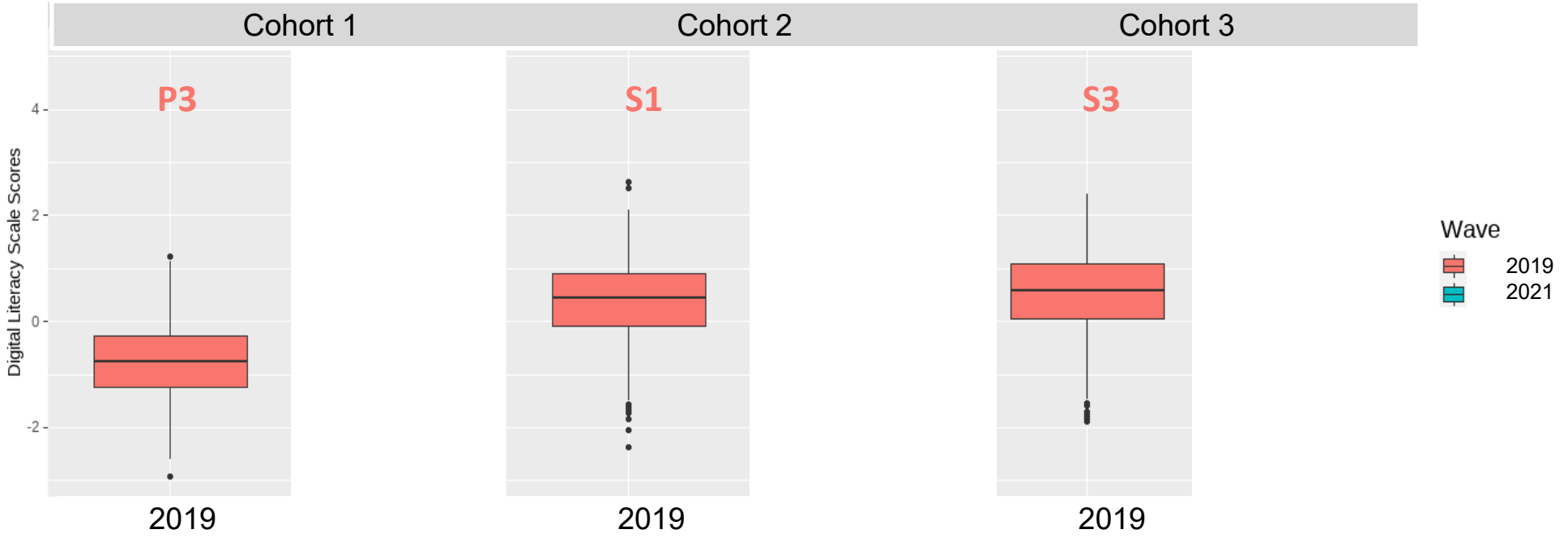
Overall, S3 students perform only slightly better than S1 students



P3 generally lower DL than S1 or S3

Digital literacy: 2019 (Wave 1) Findings

Boxplots of Students' Digital Literacy Scale Scores by Cohort across Two Waves

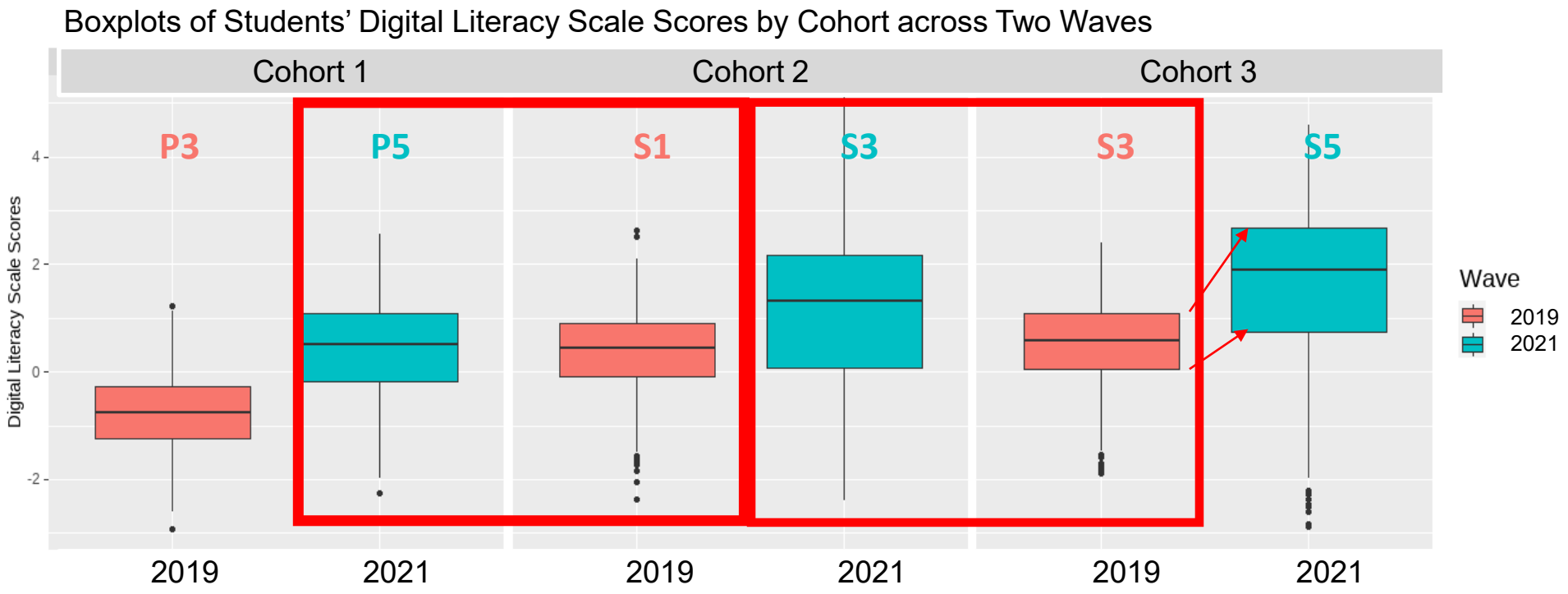


Note: 0 is equivalent to mean DL of full sample in 2019

Learning and Assessment for DIGITAL CITIZENSHIP

Digital literacy: 2021 (Wave 2) Findings

eCitizen Education 數碼素養 360 2022



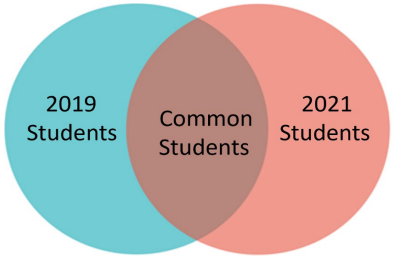
Note: 0 is equivalent to mean DL of full sample in 2019

- The mean DL scores of all three cohorts improved significantly.
- P5 students in 2021 performed as well as S1 students in 2019.
- S3 students in 2021 performed significantly better than S3 students in 2019
- The DL achievement gap has increased, and much more prominently for higher grade levels.

Learning and Assessment for DIGITAL CITIZENSHIP

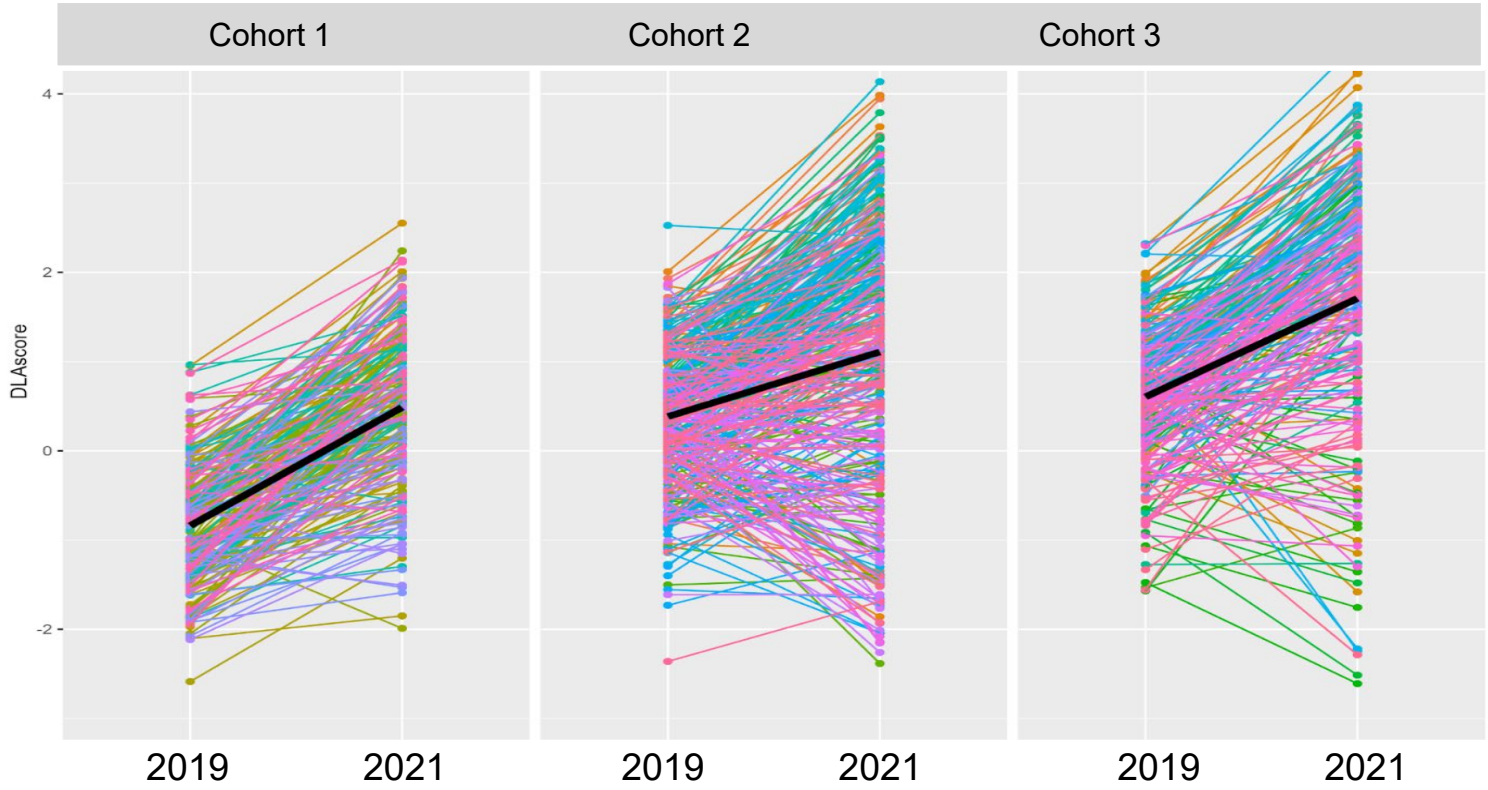
Wave-2 (Common students) Key Findings

eCitizen Education 數碼素養 360 2022



Cohorts	Schools		Classes		Students		
	2019	2021	2019	2021	2019	2021	Common
1	18	12	39	48	750	507	234
2	14	11	27	39	715	839	389
3			29	38	581	625	264

Spaghetti Plots of Individual Digital Literacy Growth Trajectories by Cohort



1. Most students have improved in their DL scores from 2019 to 2021.
2. For each cohort, there is a minority of students who have in fact regressed in their DL scores
3. The performance divide has increased over time across all three cohorts.
4. The divide gap increase is bigger for the older age cohorts.

What we don't know:
How has the DL divide affected students' overall academic performance in other subject areas, and in their wellbeing in 2022

Learning and Assessment for DIGITAL CITIZENSHIP

Within and between school digital literacy performance divides

eCitizen Education 數碼素養 360 2022

Primary school: Cohort 1

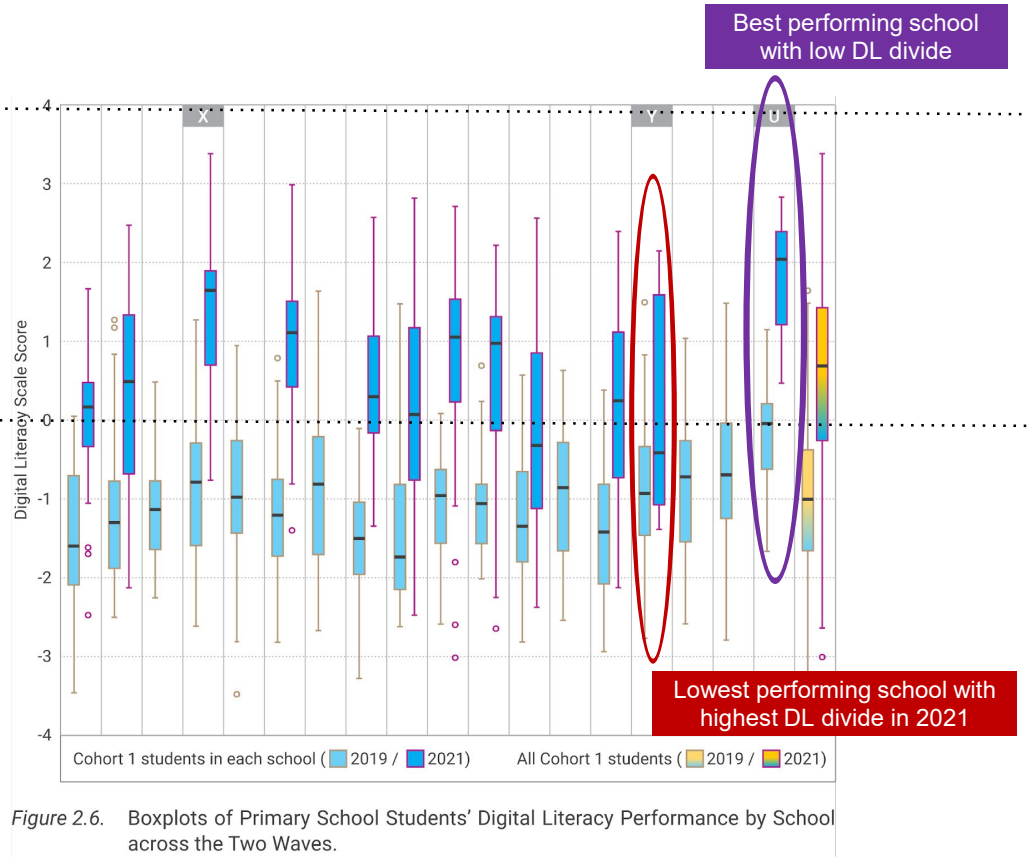


Figure 2.6. Boxplots of Primary School Students' Digital Literacy Performance by School across the Two Waves.

Mean digital literacy (DL) score for all students in 2019

Learning and Assessment for DIGITAL CITIZENSHIP

Within and between school digital literacy performance divides

eCitizen Education 數碼素養 360 2022

Secondary school: Cohort 2

Best performing school with low DL divide

Mean digital literacy (DL) score for all students in 2019

Largest DL divide in 2021

Lowest performing cohort 2 school in 2021

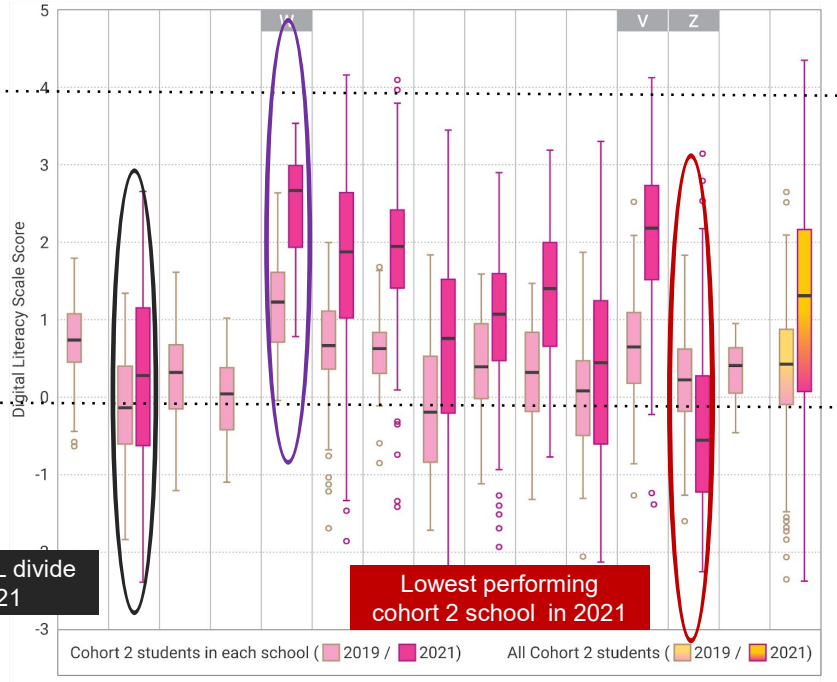


Figure 2.7. Boxplots of Cohort 2 Students' Digital Literacy Performance by School across the Two Waves.

Secondary school: Cohort 3

Best performing school with low DL divide

Largest DL divide in 2021

Lowest performing cohort 3 school in 2021

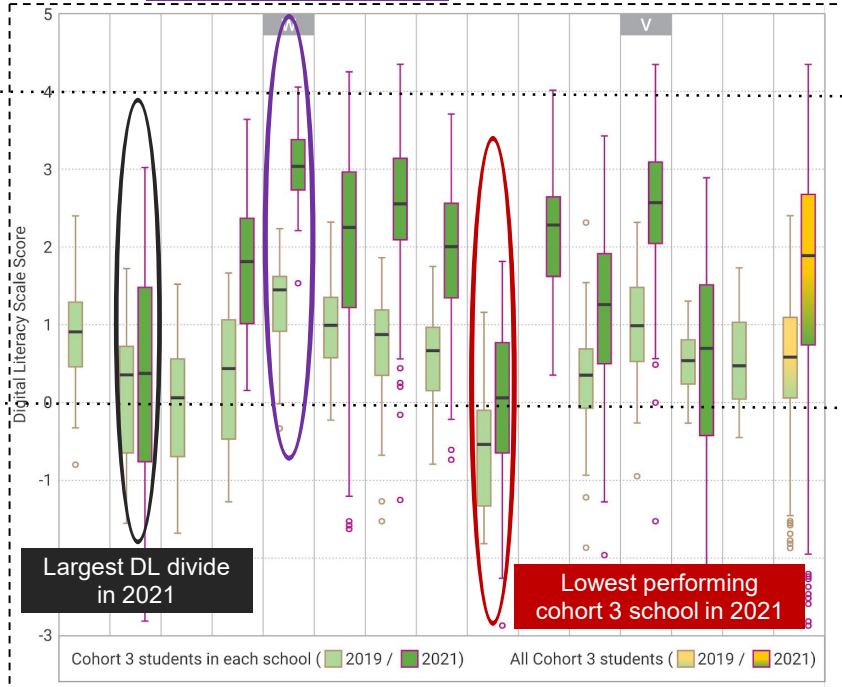
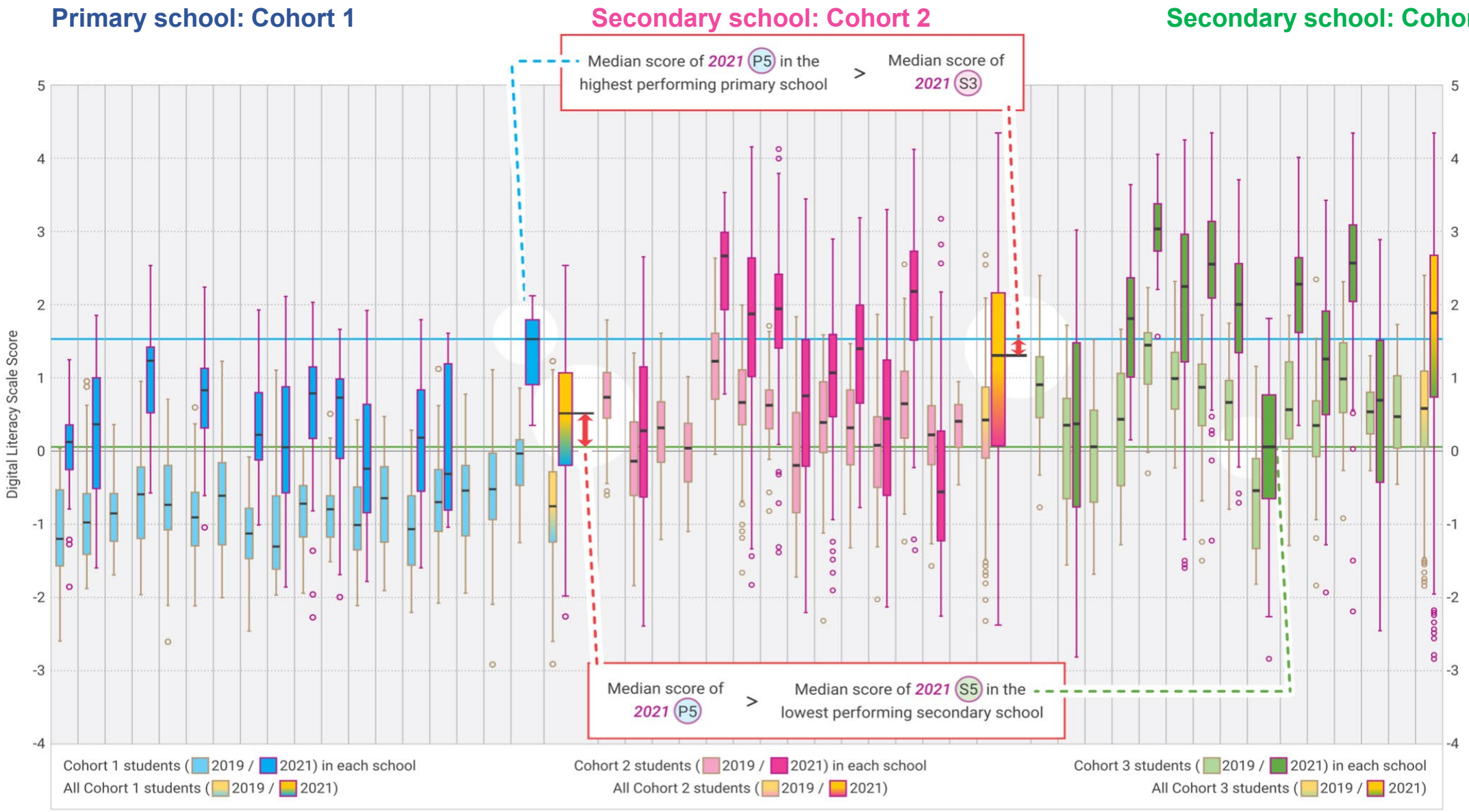


Figure 2.8. Boxplots of Cohort 3 Students' Digital Literacy Performance by School across the Two Waves.

Learning and Assessment for DIGITAL CITIZENSHIP

eCitizen Education 數碼素養 360 2022

Within and between school digital literacy performance divides



Key Findings and Recommendations

- From 2019-2021, the mean Digital Literacy (DL) scores of all three cohorts improved significantly, but the DL achievement gap has increased, and much more prominently for higher grade levels. Serious and increasing digital competence divides appeared within and across schools over time.
- With the advancement of digital technology, how individuals and organizations will not be replaced by machines and technology, but enjoy higher wellbeing. The improvement of digital literacy is essential.

- We recommend that DL as a core curriculum component should be integrated across the different Key Learning Areas throughout the K-12 curriculum. Measures, including the provision of professional learning and curriculum innovation support should be provided to schools and families for the development of appropriate learning environments and school-based curriculum opportunities to foster students' DL.
- DL competence can only be achieved if the curriculum and learning activities change in tandem with scientific and technological advances and the actual context of students, through school-based interdisciplinary collaboration to carry out curriculum innovation, and to improve the independent learning ability of teachers and students.

Finding 1: Serious and increasing digital competence divides within and across schools over time.

Finding 2: Digital competence contributes positively to online learning and protects against online risks.

Finding 3: Home resources, digital parenting, school culture, and e-learning leadership are significant factors influencing digital citizenship development.

Conceptual Framework of the relations between DL and cyber-wellness

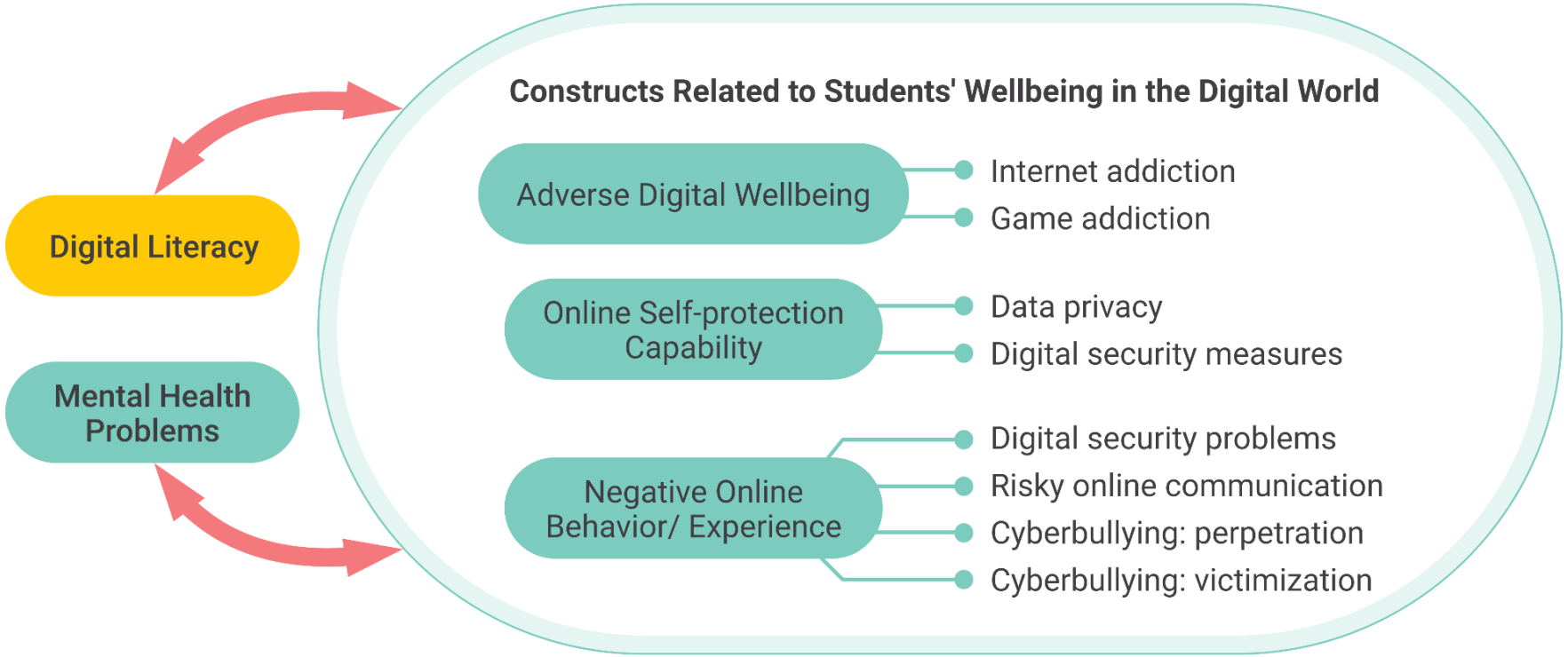
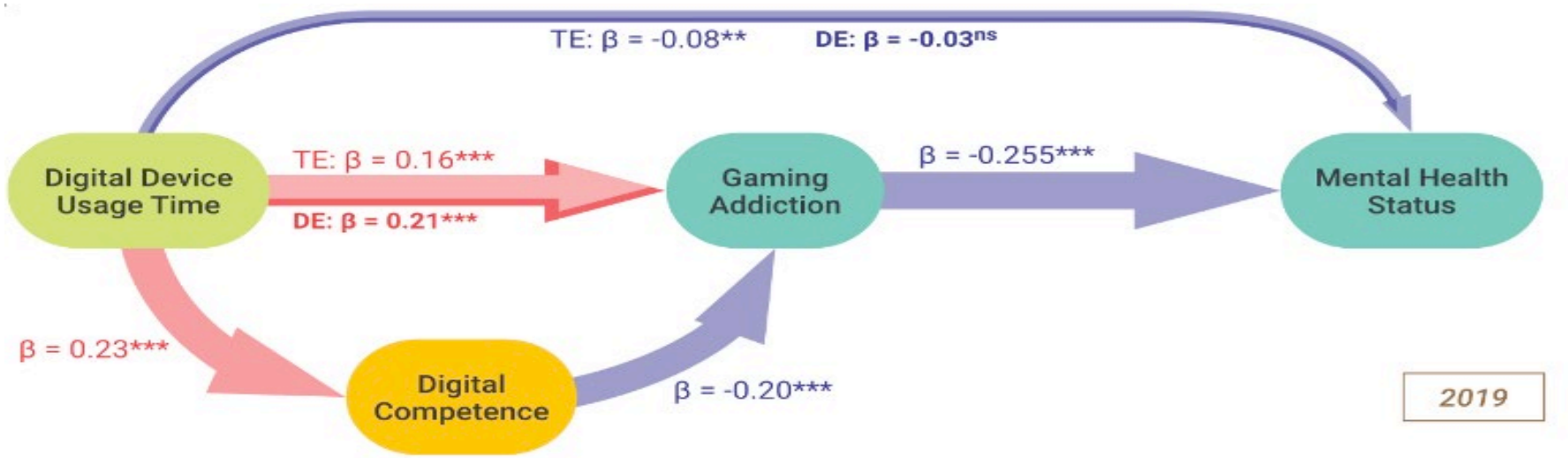


Figure 5.1. Conceptual Framework of the Relationships between DL, Mental Health Problems, and Constructs Associated with Wellbeing in the Digital World.

Study I
Digital competence protective against mental health issues related to digital technology use

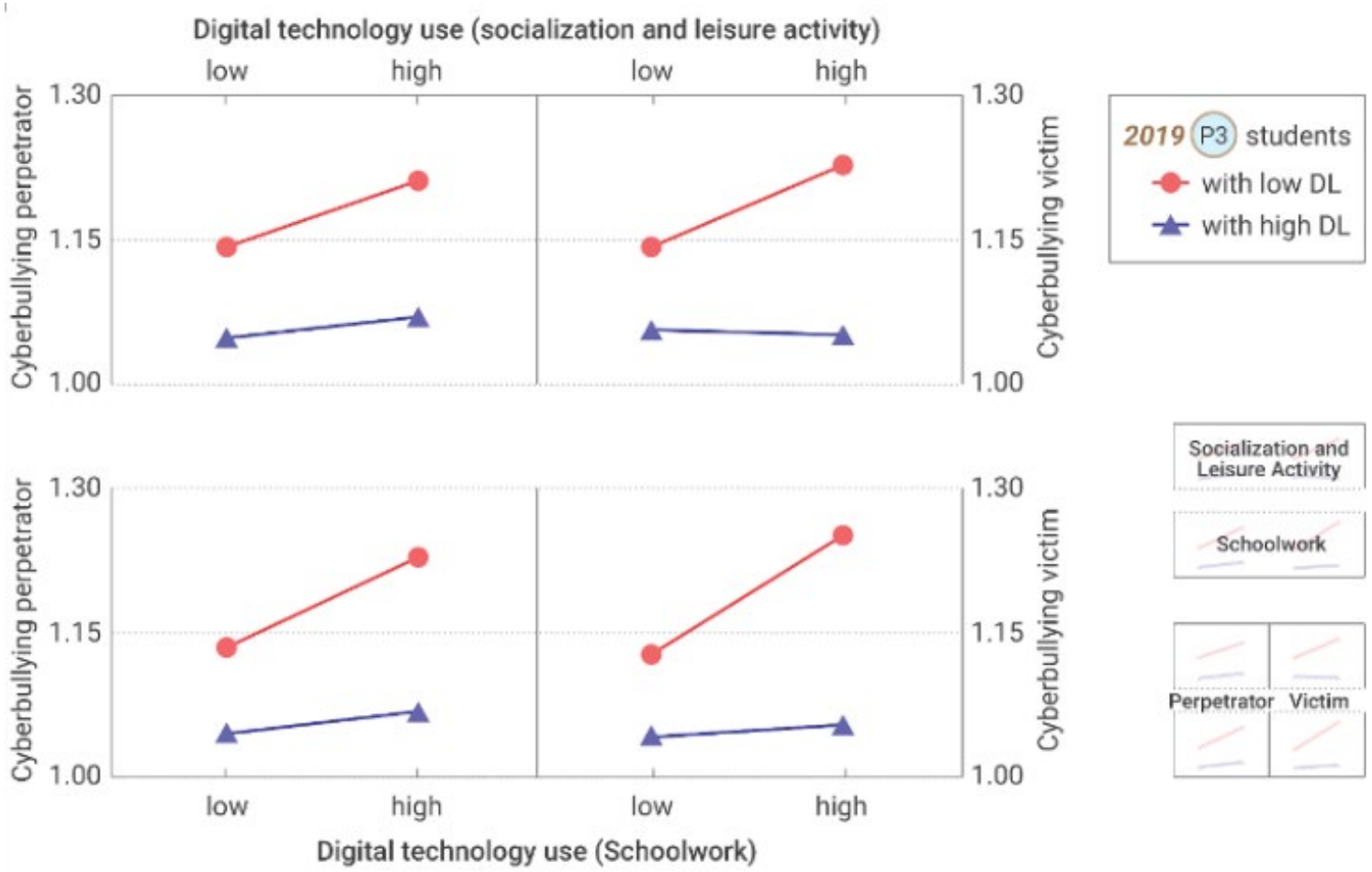


- Digital competence is associated with less gaming addiction and could potentially lead to better mental wellbeing by reducing the risks of gaming addiction and cyberbullying.

•Tso, W.W.Y., Reichert, F., Law, N., Fu, K.W., de la Torre, J., Rao, N., Leung, L.K., Wang, Y-L., Wong, W.H.S., & Ip, P. (2022). Digital competence as a protective factor against gaming addiction in children and adolescents: A cross-sectional study in Hong Kong. *The Lancet Regional Health - Western Pacific, 20*, 100382. https://doi.org/10.1016/j.lanwpc.2022.100382

Study II

Digital competence protect against cyberbullying if a child's time on devices increase



- Children with higher DL levels are less likely to be victims of cyberbullying when the frequency of digital technology use was high.

- Tao, S., Reichert, F., Law, N., & Rao, N. (2022). Digital Technology Use and Cyberbullying Among Primary School Children: Digital Literacy and Parental Mediation as Moderators. Cyberpsychology, Behavior and Social Networking, 25(9), 571–579. https://doi.org/10.1089/cyber.2022.0012

Key Findings and Recommendations

- Digital competence contributes positively to online learning and protects against online risks.

➢ Education that promotes digital competence is essential to maximize the benefits of media use, while reducing the potential adverse effects from the inappropriate use of digital devices.

Finding 1: Serious and increasing digital competence divides within and across schools over time.

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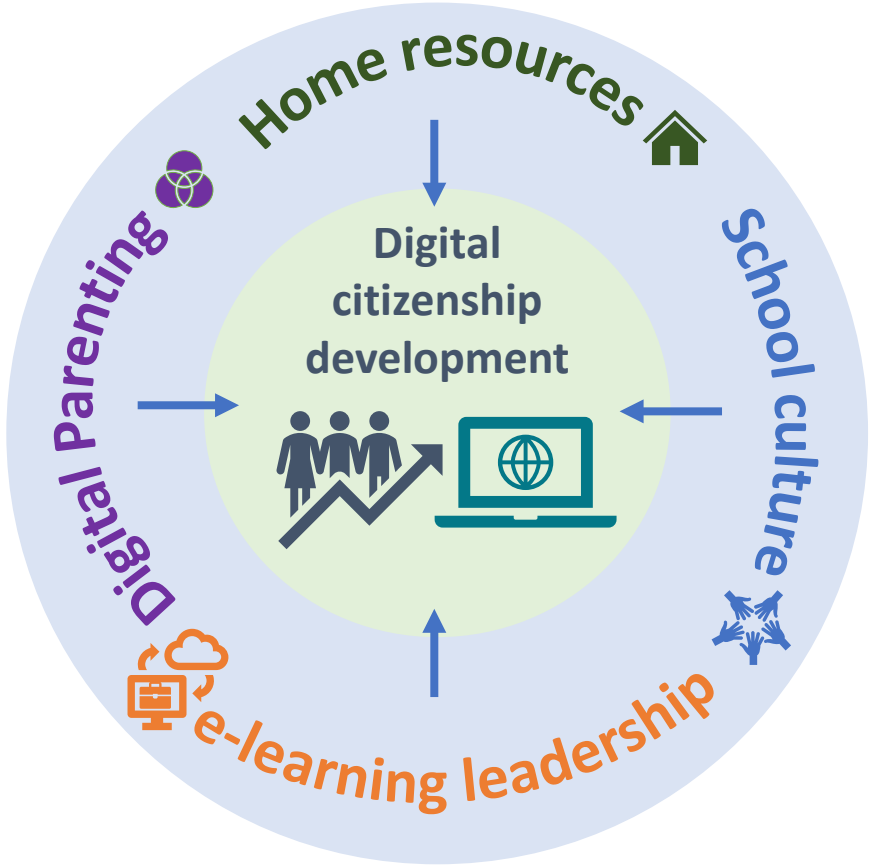


Home resources	Digital parenting	School culture	e-learning leadership

Home resources

Academic social capital (**ACAD-CAP**):

- parental education levels
- the number of books at home

Home resources (**HOME-RES**):
whether students have:

- their own room
- study desk
- a quiet place to study

Digital competence and students' SES (2021)

Family SES measurement

Academic social capital (**ACAD-CAP**):
- parental education levels
- the number of books at home

Home resources (**HOME-RES**): whether students have:
- their own room
- study desk
- a quiet place to study

Correlations between DLA and SES (ACAD-CAP and HOME-RES) across Cohorts (2021)

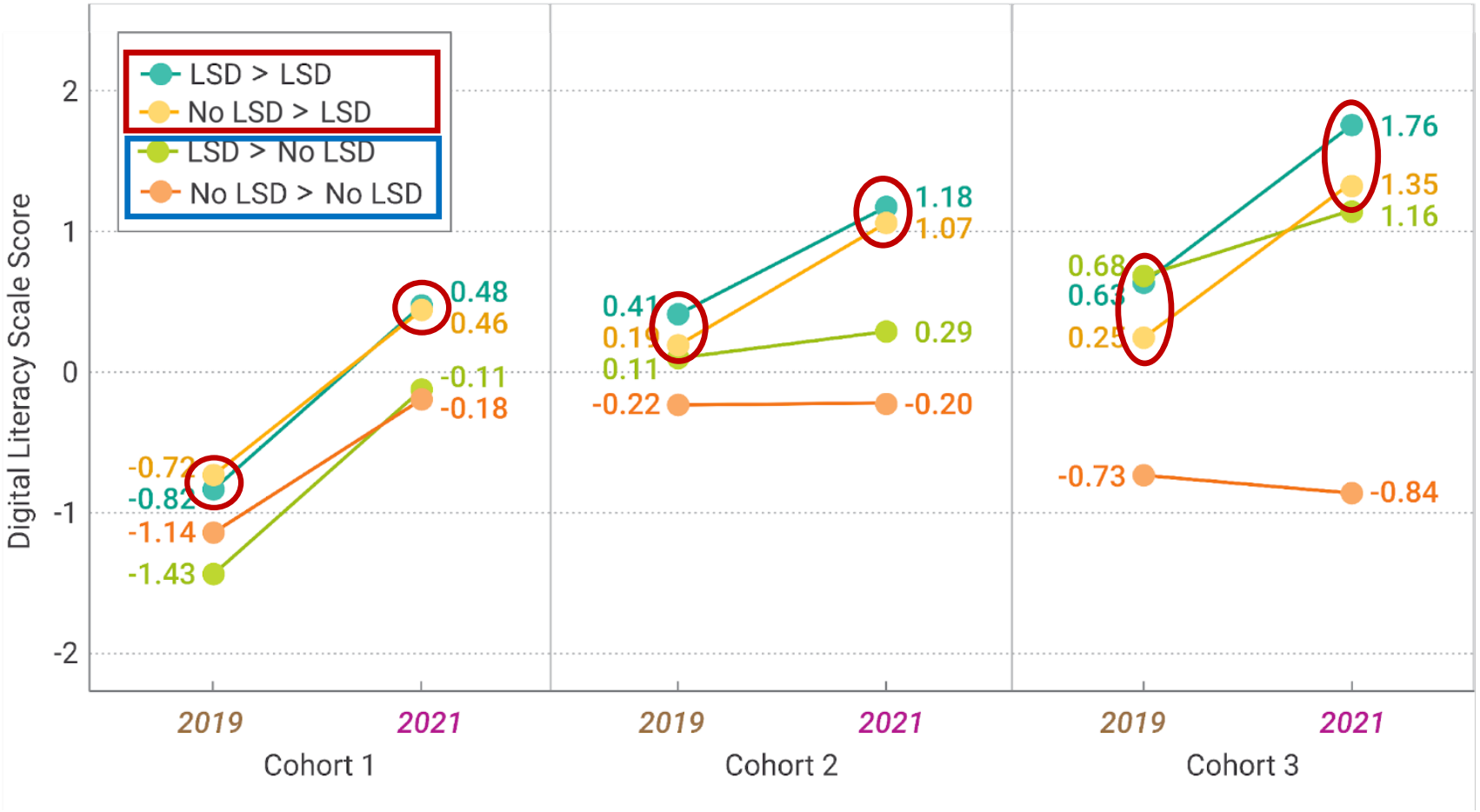
Cohort	ACAD-CAP	HOME-RES
C1	0.17**	0.14**
C2	0.13**	0.06
C3	0.08	0.02

Note. ** p<0.01

- Family SES is positively related to students' DL achievement
- The SES impact is greatest at younger ages
- Academic capital is more influential than home resources (overall economic status)

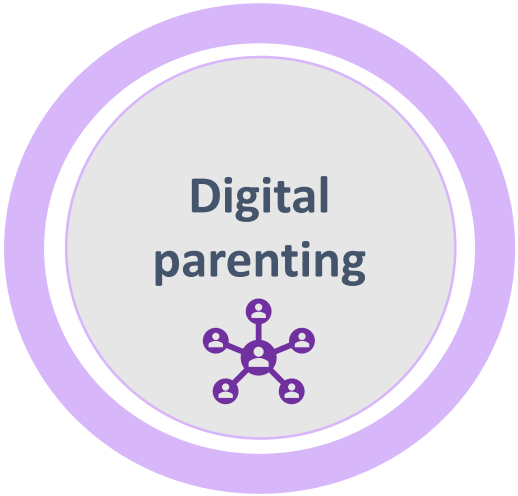
Effect of SES on DL achievement found only at the school level:
- Students studying in schools with higher mean SES have higher DL
- Students' family SES does not affect their DL compared to students in the same school

Large screen devices (LSD) and digital literacy development (2019vs2021)



- Students with no LSD at home in 2021 have significantly lower DL
- In 2019, the DL performance gap between those who have and those who do not have LSDs were age dependent: no difference for cohort 1, but biggest for cohort 3.
- Cohort 1 students who did not have LSDs in 2019 but had LSDs in 2021, they were able to catch up with the rest of the cohort.
- For Cohort 2 &3 students who did not have LSDs in 2019 but had LSDs in 2021, they were able to achieve similar growth as the rest of their cohorts, but the difference in DL achievements remained.

Digital parenting



Refers to the extent to which parents empowering their teens to be good digital citizens that can minimize online risks and maximize potentials in the digital world.
The specific questions including

- family media boundary,
- knowledge on utilizing technology
- consistency on parenting practices.

Mean levels of digital parenting (2022)

School type	Digital parenting
Primary	3.45
Secondary	3.19

1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, 5 = strongly agree

Digital parenting measures the extent to which the parent:

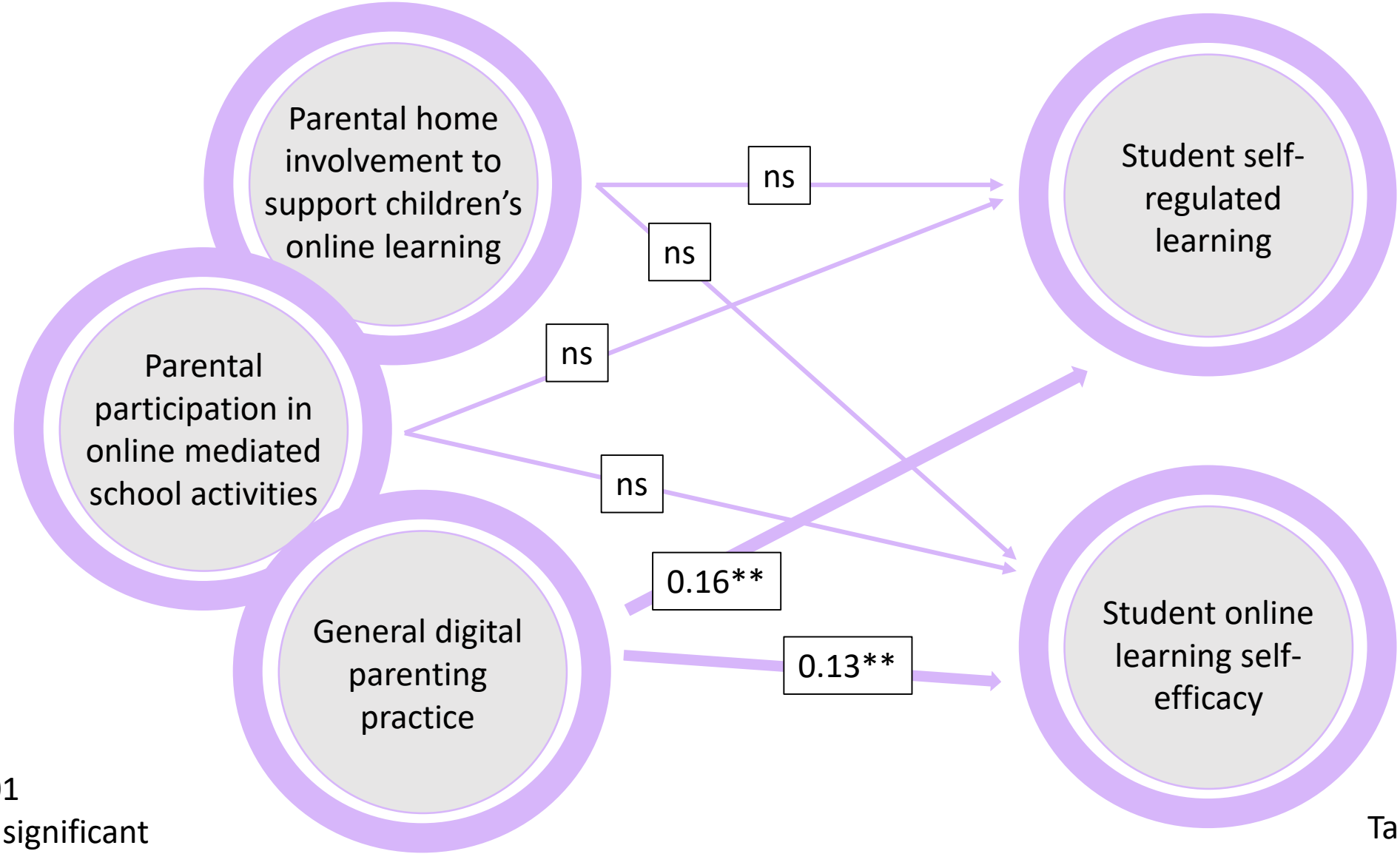
(1) understands what are good digital practices such as how to use online resources productively & minimizing risks,

(2) model and set rules about the use of media in the family

- **Digital parenting can empower children to be good digital citizens who can minimize risks and maximize their own potentials in the digital world.**
- **Primary parents are found to be more likely to use digital technologies in their parenting and to moderate their children's media use than secondary parents.**

Study III

Digital parenting positively predicted student's online learning outcomes

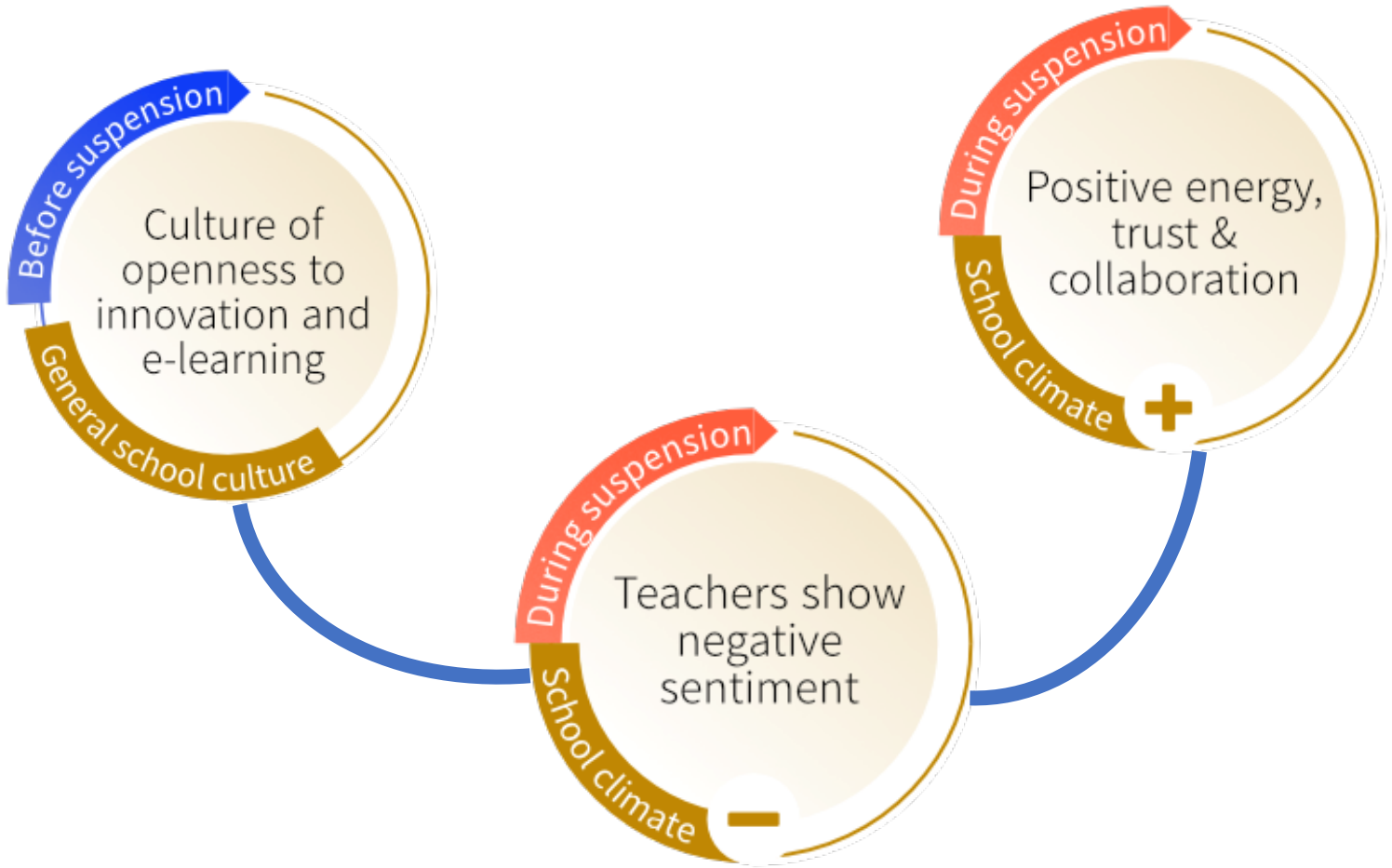


** p < .01

ns = not significant

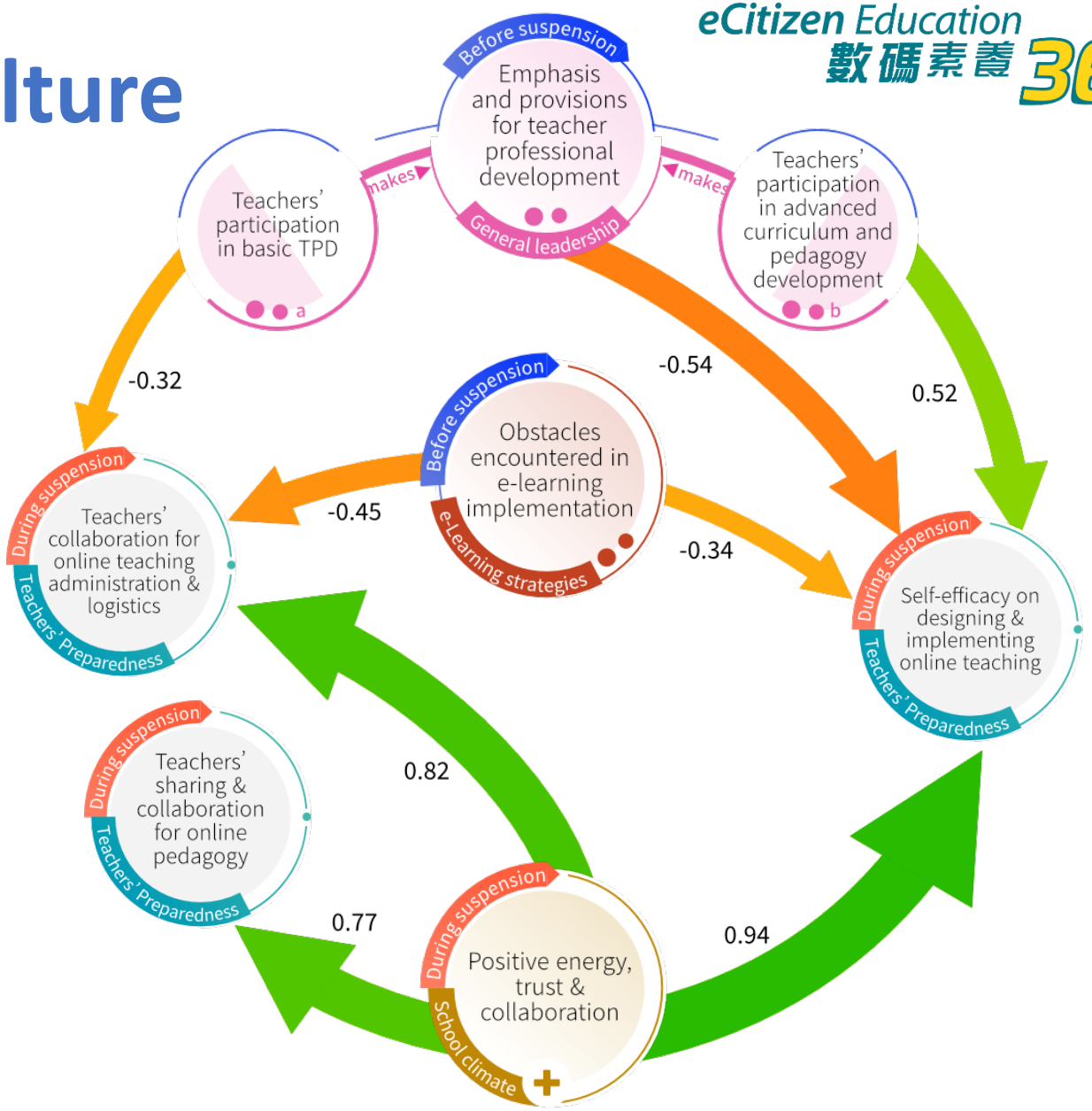
Tan et al., (Under review)

School culture



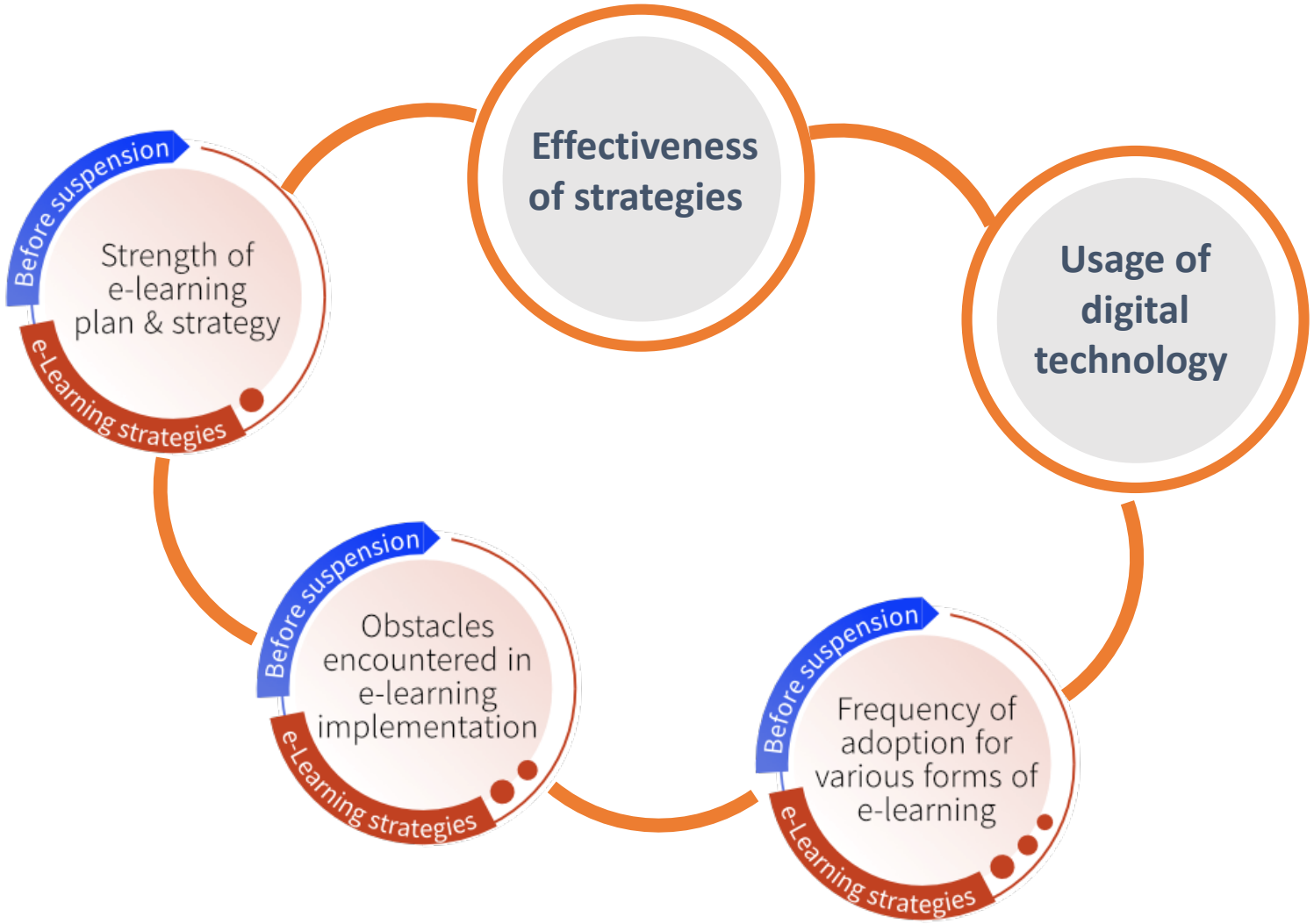
School culture

- Campus-wide culture of collaboration, mutual trust, and openness to innovation are key conditions for online teaching and learning preparedness during the New Normal
- Leaders' overall school development priorities and strategies are the strongest predictors of positive school culture and forward planning for online T&L in 2020-21

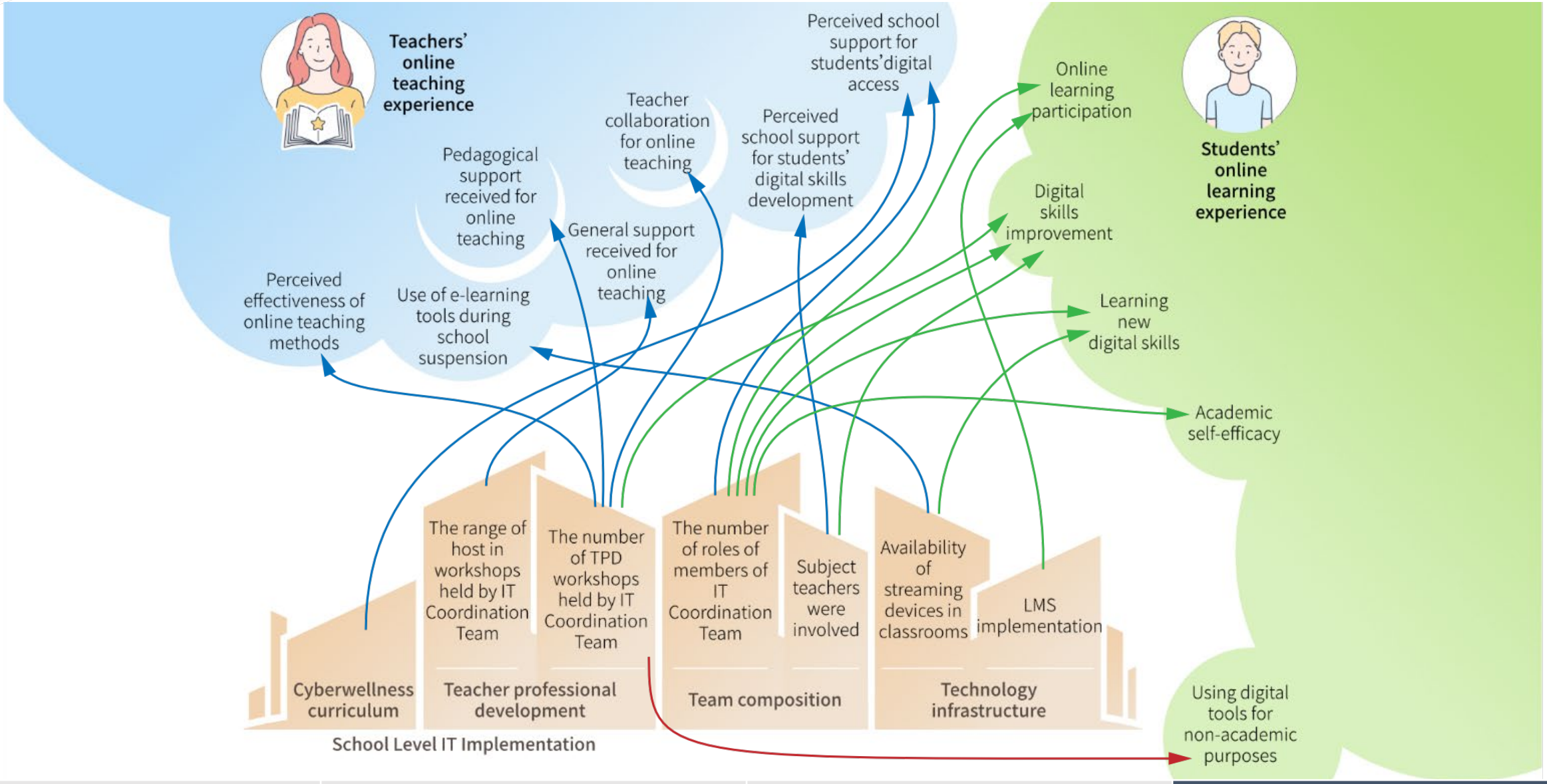


In the e360 (2020)3th bulletin (from Teacher Surveys):
The most significant factors to teachers' online teaching preparedness

e-learning leadership



Correlations between school level IT implementation and e-learning experience of teachers and students



Key Findings and Recommendations

- Home resources, digital parenting, school culture, and e-learning leadership are significant factors influencing digital citizenship development.

➢ Parents and caregivers should receive more support from schools and other stakeholders to enhance their understanding and practice in digital parenting.

➢ Schools need to reach out for external support for teacher professional learning and leadership development to enhance their online T&L preparedness, rather than by “learning through failures” only. Participation in school-based projects that foster pedagogical innovations and promote active collaboration and mutual trust are most beneficial.

Summary of Research Findings

Finding 1: Serious and increasing digital competence divides within and across schools over time.

Finding 2: Digital competence contributes positively to online learning and protects against online risks.

Finding 3: Home resources, digital parenting, school culture, and e-learning leadership are significant factors influencing digital citizenship development.

Recommendations

For students:

- Provide more support service to enhance students' DL, online learning, cyberwellness, and socioemotional wellbeing.
- Need further research to investigate the cumulative impact on students' academic outcomes.

For parents:

- Need more parenting support, particularly on digital parenting to support children's digital learning & wellbeing.
- Special attention should be given to parental education and support for secondary parents.

Recommendations

For schools:

- More focus on the provision of professional learning opportunities and to foster a collaborative culture among teachers on effective online, blended, and hybrid teaching and learning to support student-centered learning and wellbeing.
- The connotation of digital literacy can be achieved by following the development of technology and the actual situation of students, through school-based interdisciplinary collaboration to carry out curriculum innovation, and to improve the independent learning ability of teachers and students.
- More efforts to leverage community resources and support for school development.

For the community and policy makers:

- There is an urgent need for the school curriculum to be updated to ensure that students can have the appropriate opportunities for learning across the curriculum to develop their digital competence for well-being and future readiness.
- Current community support efforts should be continued and strengthened. In particular, it is important to recognize that access to and access to technological tools does not necessarily enhance digital literacy and well-being; it is more important to support collaboration and innovation in school-based curricula and pedagogy.

International Baccalaureate
Baccalauréat International
Bachillerato Internacional

Statement from the IB about ChatGPT and artificial intelligence in assessment and education

How should the Hong Kong school system and educational community prepare for our *Digital Future*?

謝謝!

Thank you!

Respondent 回應者

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