Learning and Assessment for
DIGITAL CITIZENSHIP

Growing up as Digital Citizens in Hong Kong: Findings from a Multi-age Study

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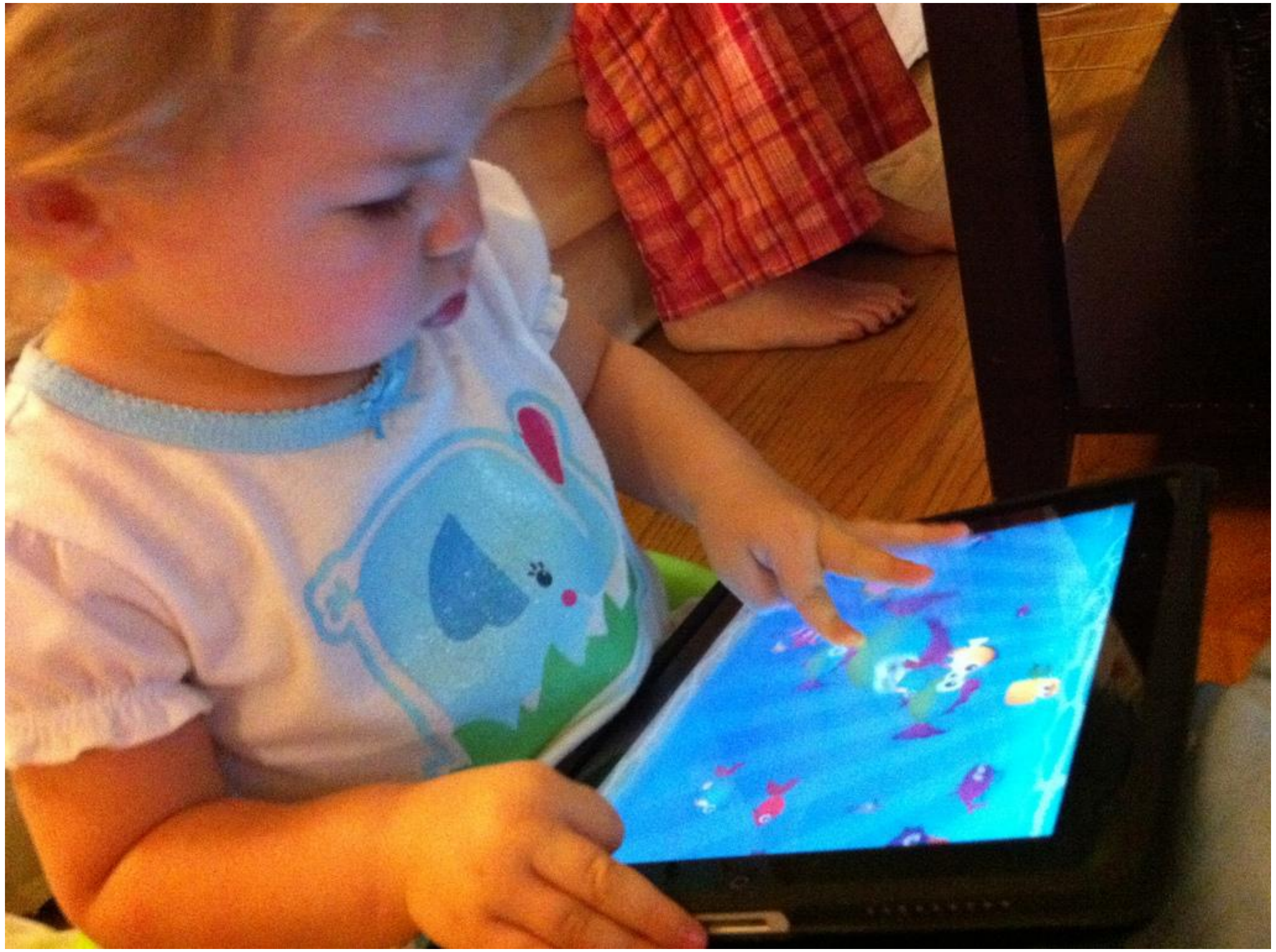
Digital Natives?



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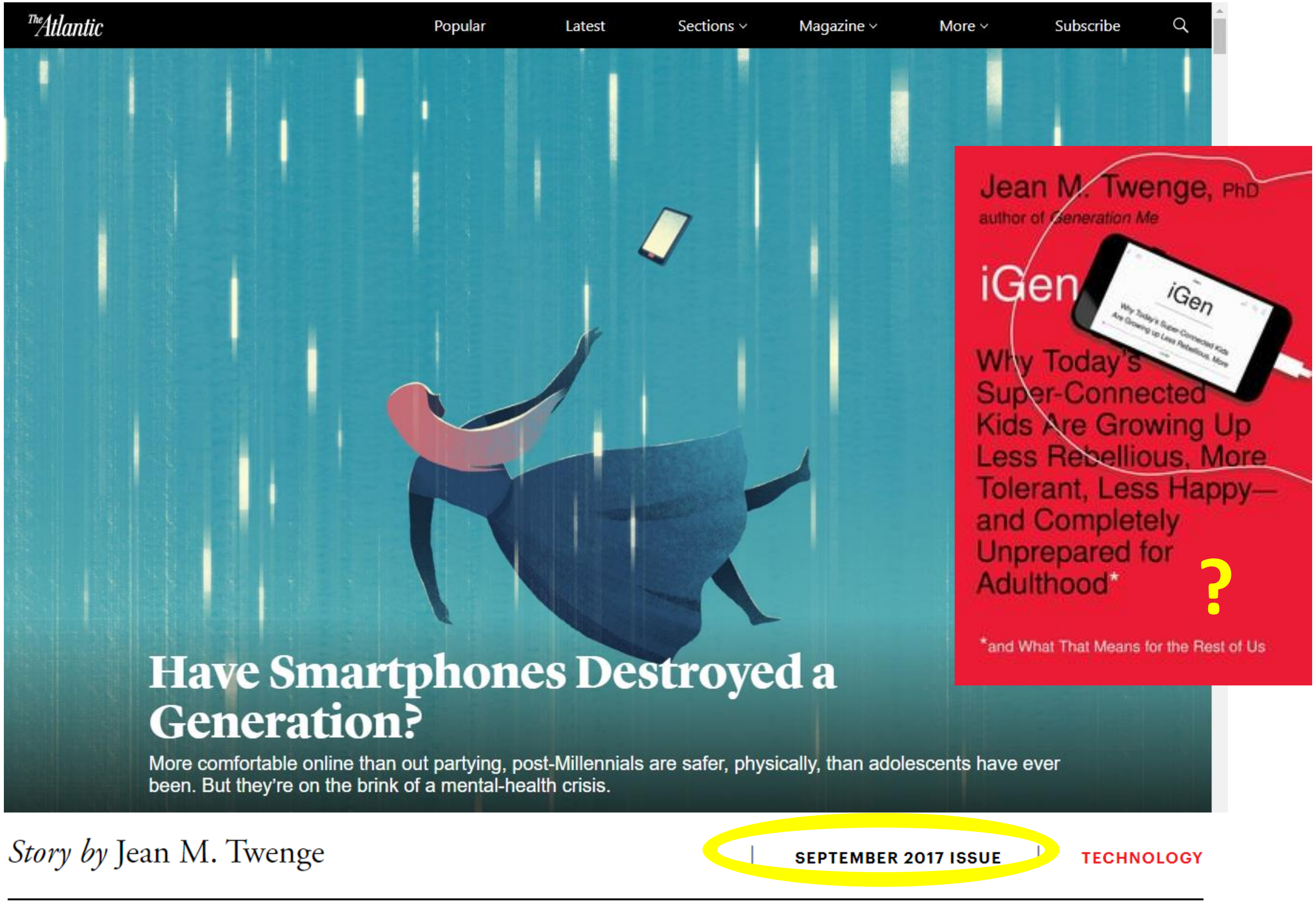
Internet Risks and Public Panic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Have Smartphones Destroyed a Generation?

More comfortable online than out partying, post-Millennials are safer, physically, than adolescents have ever been. But they're on the brink of a mental-health crisis.

Story by Jean M. Twenge | SEPTEMBER 2017 ISSUE | TECHNOLOGY

Jean M. Twenge, PhD
author of *Generation Me*

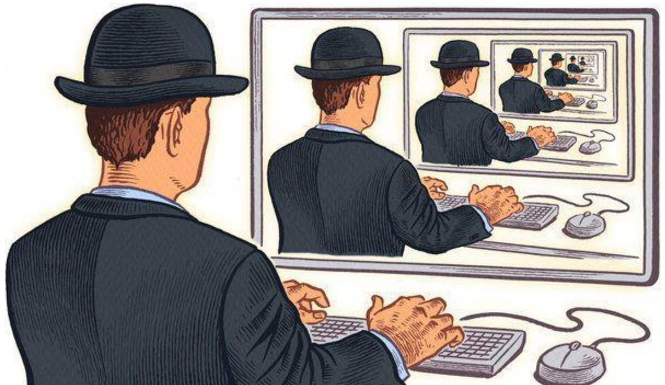
iGen

Why Today's Super-Connected Kids Are Growing Up Less Rebellious, More Tolerant, Less Happy—and Completely Unprepared for Adulthood*

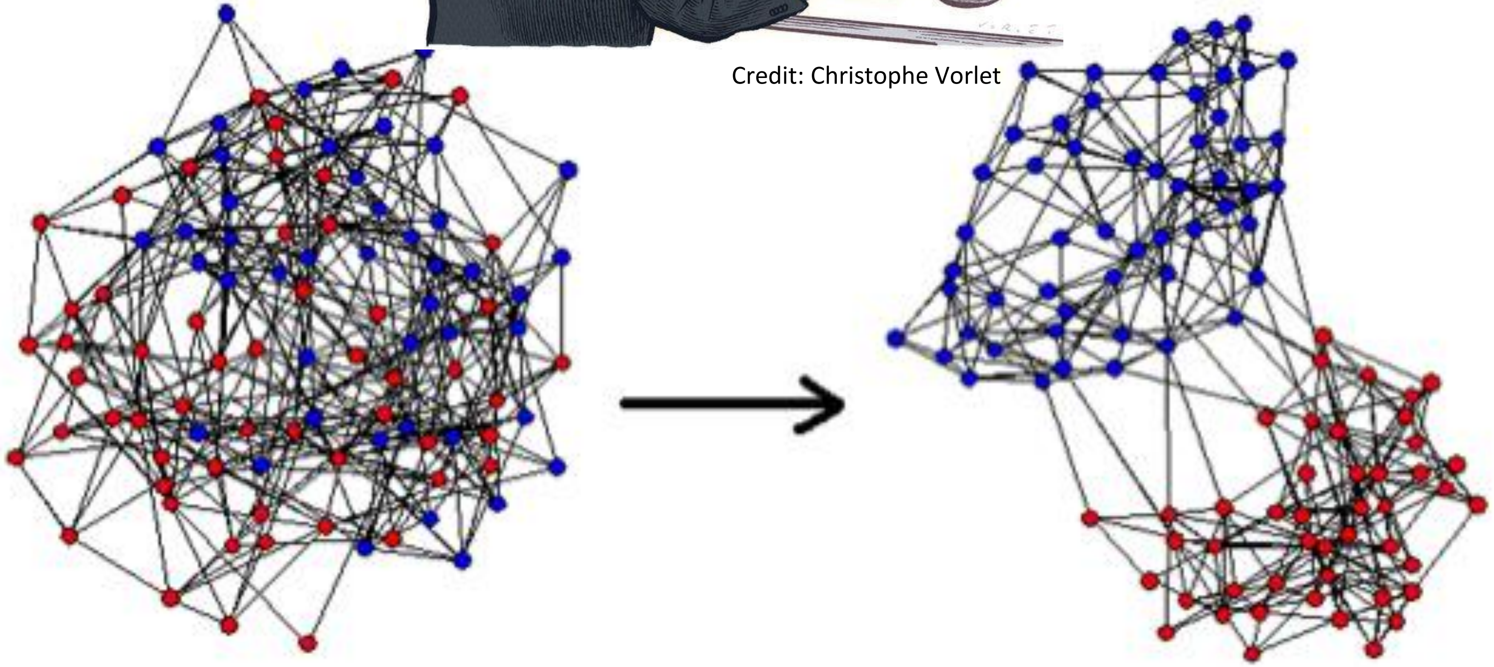
*and What That Means for the Rest of Us

?

Polarization, Echo Chamber, and Information Cocoon

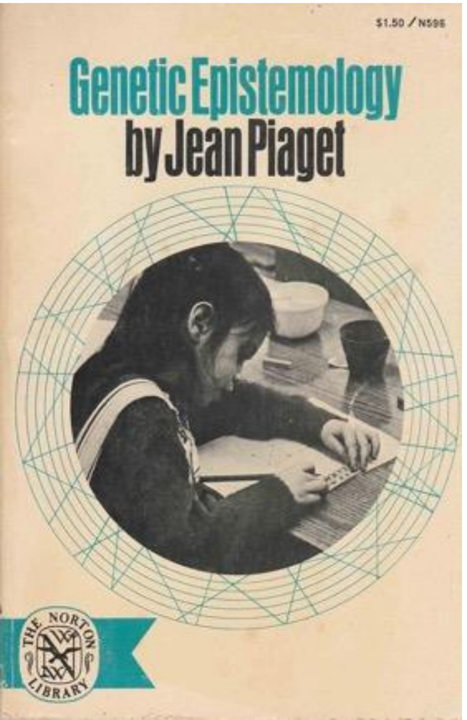


Credit: Christophe Vorlet



GRAND CHALLENGE

Jean Piaget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Genetic Epistemology
by Jean Piaget
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Understanding and improving the development of digital citizenship as a multifaceted human capacity from childhood to early adulthood

What is Digital Citizenship?

- Citizenship (traditional) - membership of geopolitical entities such as nation states….. people grew up, lived and worked in neighborhoods home to others who shared their language, culture, religion and values
- People engage not only in physical and face-to-face interaction, but also increasingly via virtual community by means of digital communication tools.
- Multiple citizenship identities, reflecting one’s participation in different communities
- Participative identity

Digital Citizenship: Curriculum Perspectives

- Ethics, rights and responsibilities in the networked society
  - e.g. online bullying, hate speech
- Media literacy for critical and responsible participation on- & off-line
  - E.g. online deliberation, “fake news”
- Capacity building for digital citizenship
  - E.g. education and economic opportunities

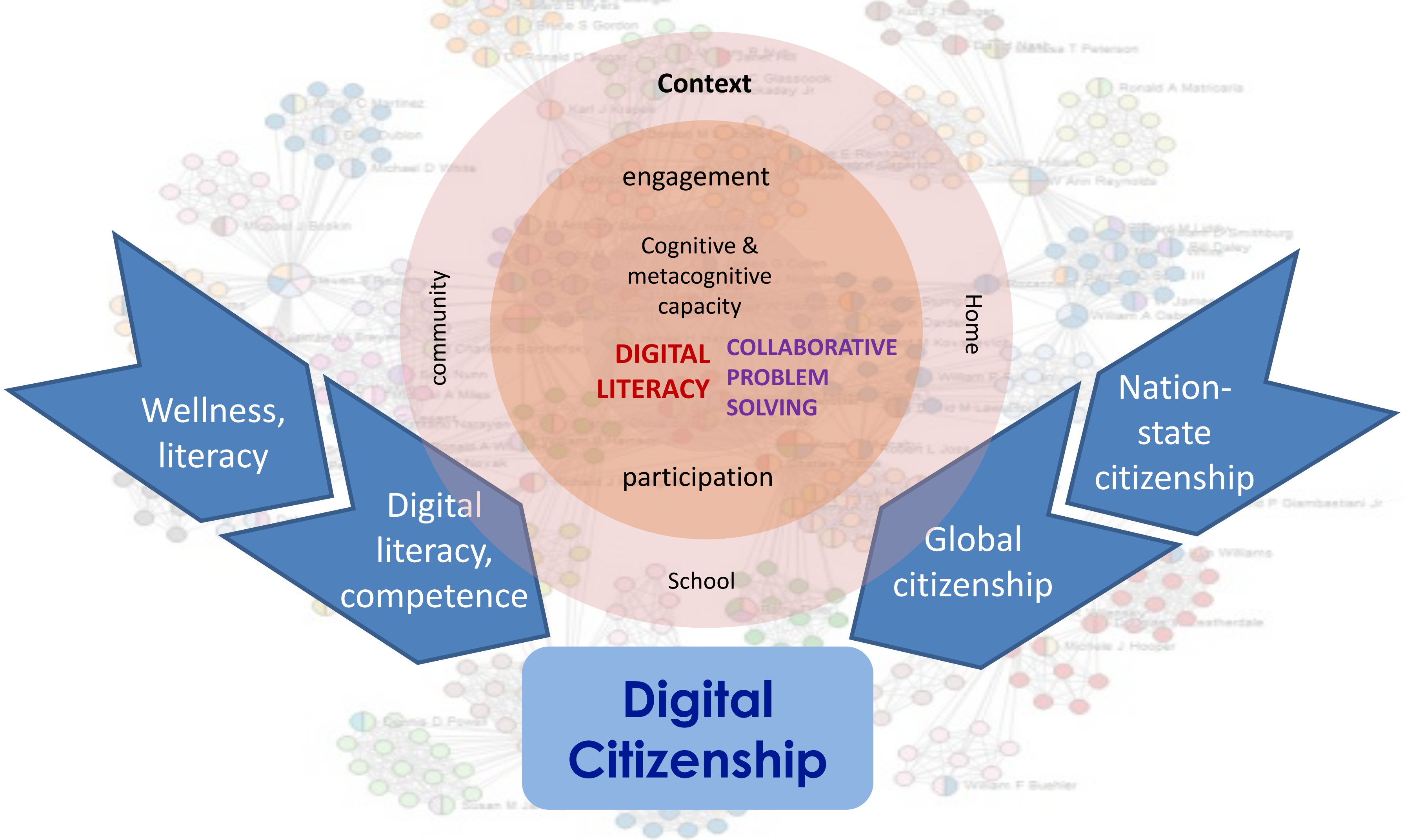
Impact of Digital Technology on Citizenship

- Augmented performance & connectedness
- Rights & Responsibilities → Engagement & Participation

DIGITAL CITIZENSHIP AS WELLNESS			
WELLNESS CATEGORY		IMPACT OF DIGITAL TECHNOLOGY	
		Empowerment	Threats/risks
Physical	Health	Health monitors	poor sleep quality
			lack of physical exercise
	Safety	Location monitors, alerts	Cyber victimization
Psychological	Self-confidence	Digital confidence	
	Resilience	Expanded support network	Isolation on-/off- line
	Self-regulation	Self-monitoring devices	Internet addiction
	Sense of security	Cyber-connection with family, etc.	Internet addicted caregiver, cyberbullied
Social	Identity, belonging	Strengthend thro' network	Outing, cyber isolation
		New communities thro' Internet	Online harmful communities
	Participation	Expanded participation	Bubble chamber
	Contribution, activism	Online-offline activism, crowdsourcing	Fake news, indiscriminate activism
Material	Basic needs, comfort	Seek help online, entrpreneurship	Cyber-crime, identity theft

Digital Citizenship

The competence, rights (awareness) & responsibility
to engage and participate in a globally networked world



Context

engagement

Cognitive &
metacognitive
capacity

DIGITAL LITERACY

COLLABORATIVE PROBLEM SOLVING

participation

community

Home

School

Wellness, literacy

Digital literacy, competence

Nation-state citizenship

Global citizenship

Digital Citizenship

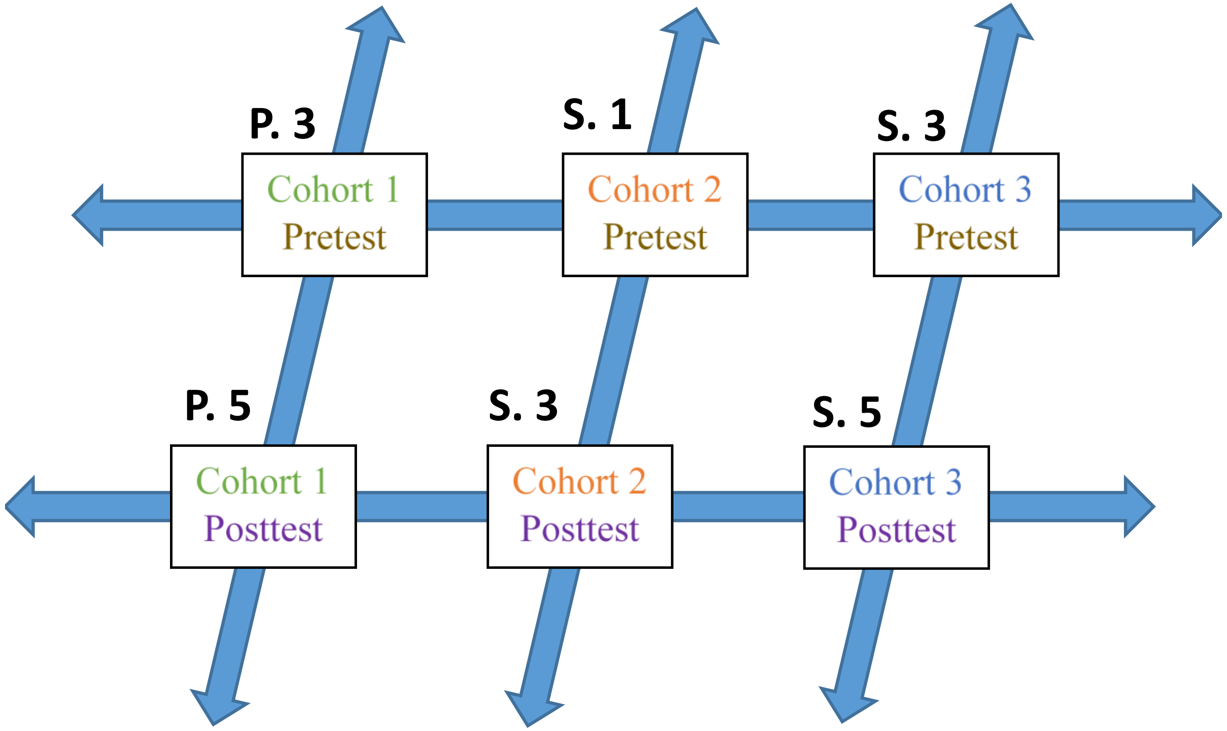
Research Questions

- What is the **normative developmental trajectory** from childhood to early adulthood in key aspects important for digital citizenship?
- What is the **game pedagogical theory** to support development of digital citizenship at different ages?
- How do **personal, family and school factors** contribute to the development of digital citizenship?

Assessing DL & CPS Across Cohorts and Over Time

Pretest:
Nov 2018 to Apr 2019

Post-test:
Oct 2020 to Dec 2020


P. 3
Cohort 1
Pretest
S. 1
Cohort 2
Pretest
S. 3
Cohort 3
Pretest
P. 5
Cohort 1
Posttest
S. 3
Cohort 2
Posttest
S. 5
Cohort 3
Posttest

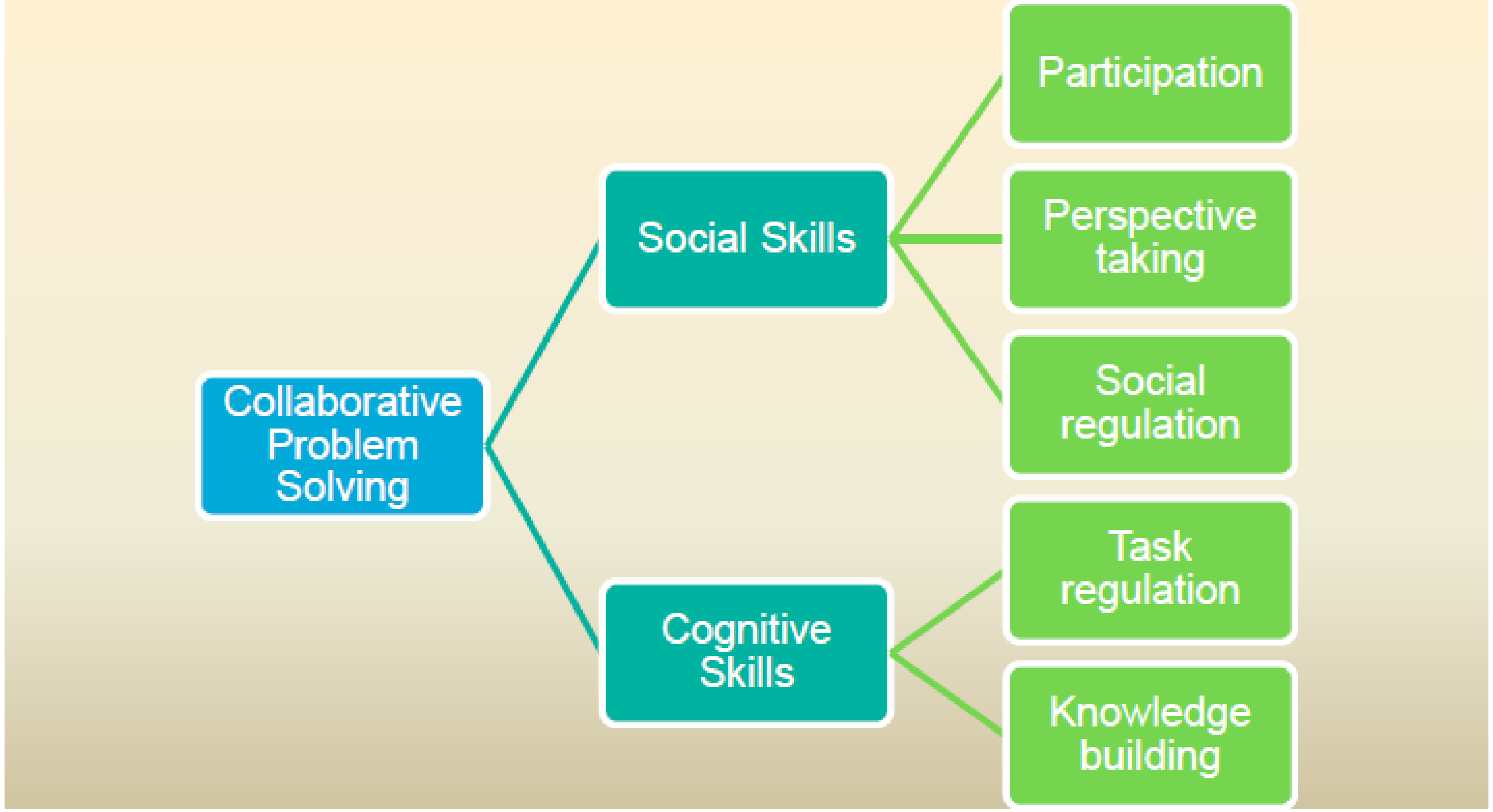
DL Assessment

5 Competence areas

1. Information and data literacy
2. Communication & Collaboration
3. Digital content creation
4. Digital Safety
5. Problem Solving using digital technology

- Final assessment included **80 items** spread over **3 test forms** (7 items were discarded during scaling)
- Better fit for **unidimensional competence**
- **High reliability** estimates for the three booklets

Assessment Framework for the CPS Test (ARC)



- Collaborative Problem Solving
  - Social Skills
    - Participation
    - Perspective taking
    - Social regulation
  - Cognitive Skills
    - Task regulation
    - Knowledge building

Six Proficiency Levels:
for CPS Cognitive and Social Skills

	Cognitive skills	Social skills
Level 6	Refined Strategic Application & Problem Solving	Cooperation & Shared Goals
Level 5	Efficient Working	Valued Partnership
Level 4	Strategic Planning & Executing	Mutual Commitment
Level 3	Gathering & Collecting Information	Awareness of Partnership
Level 2	Systematic Trial & Error	Supported Working
Level 1	Exploration	Independent Working

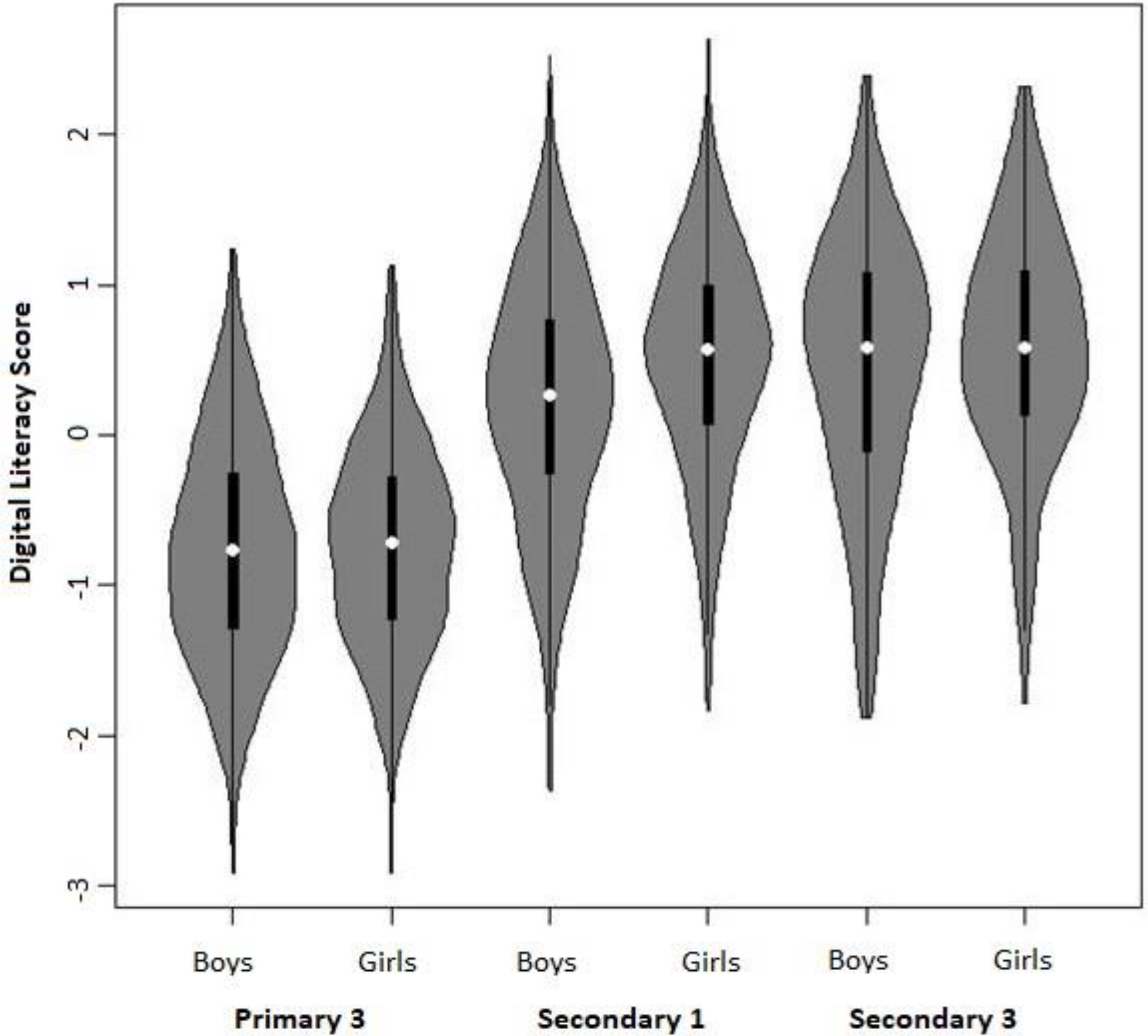
Preliminary findings

Data

- Random selection of **four districts**
- Some **replacement schools** are not located in these districts
- Students from **two classes per cohort**—either Primary 3 or Secondary 1 and Secondary 3—were randomly sampled

Cohort	Schools	Classes	Responses				
			DLA	CPS	SVY	Teachers	Principals
1	18	39	750	N/A	736	169	9
2	14	27	715	705	711	88	9
3		29	581	593	581	104	

DL Performance by Gender



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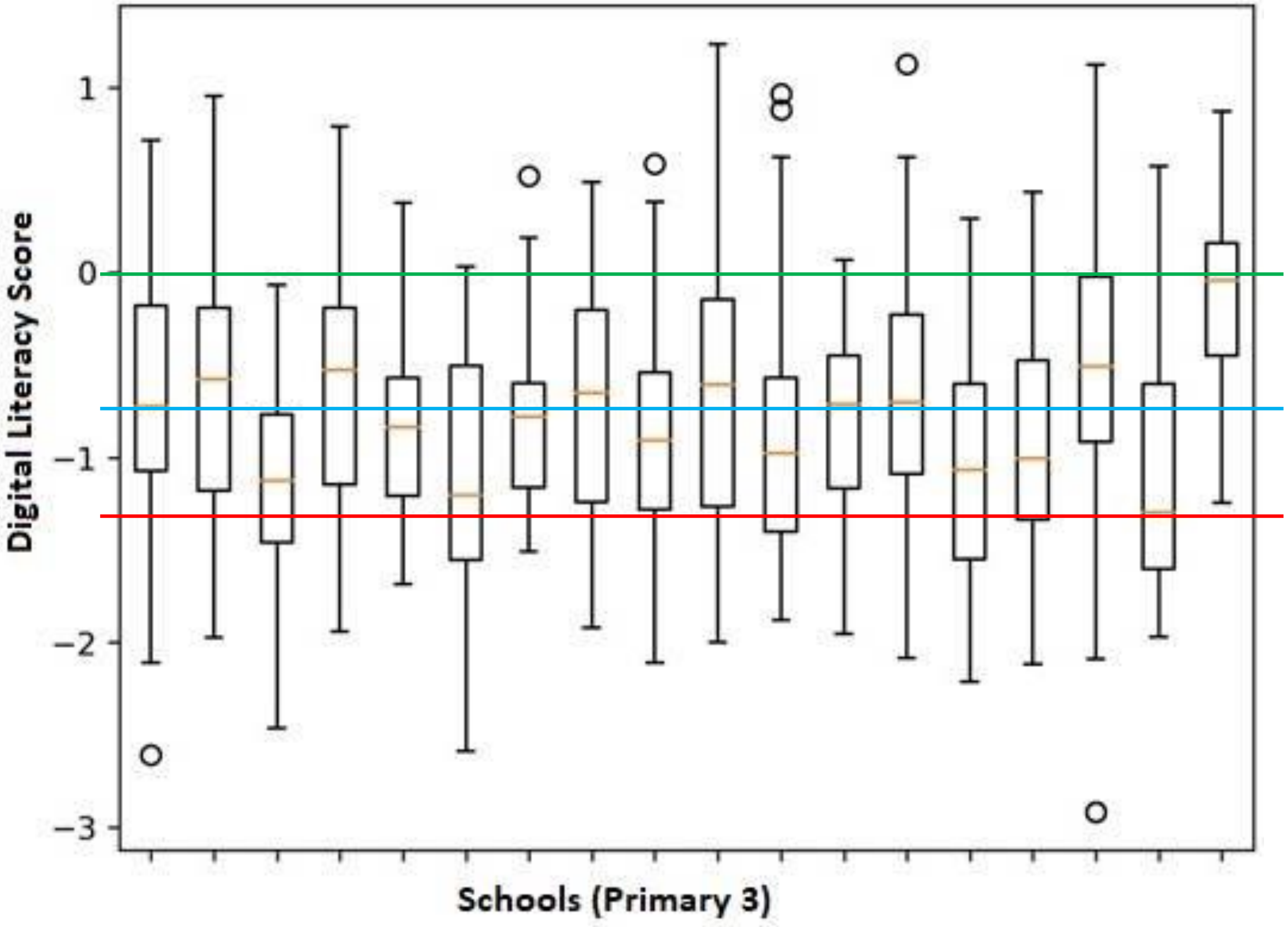
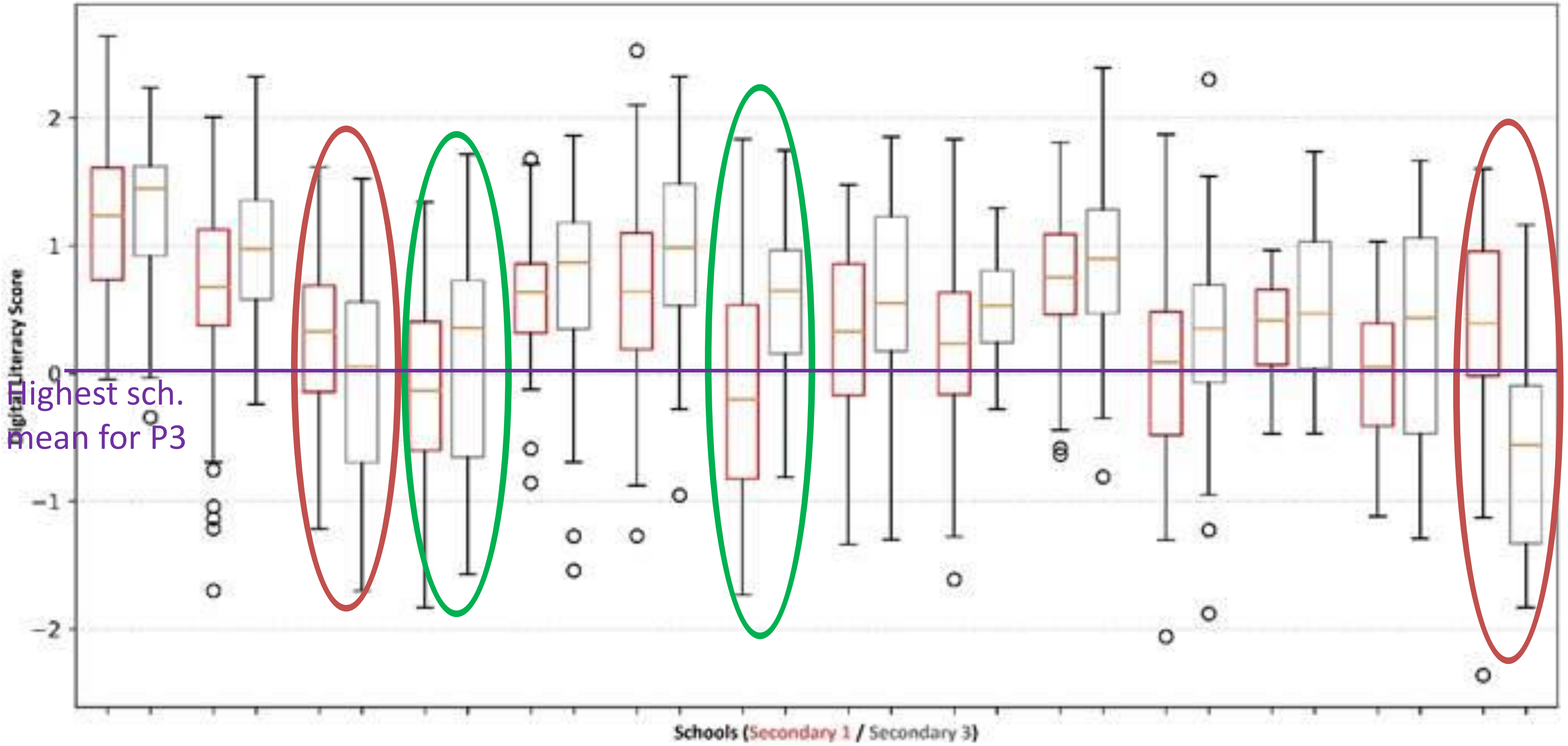
DIGITAL CITIZENSHIP

Digital Literacy @P3

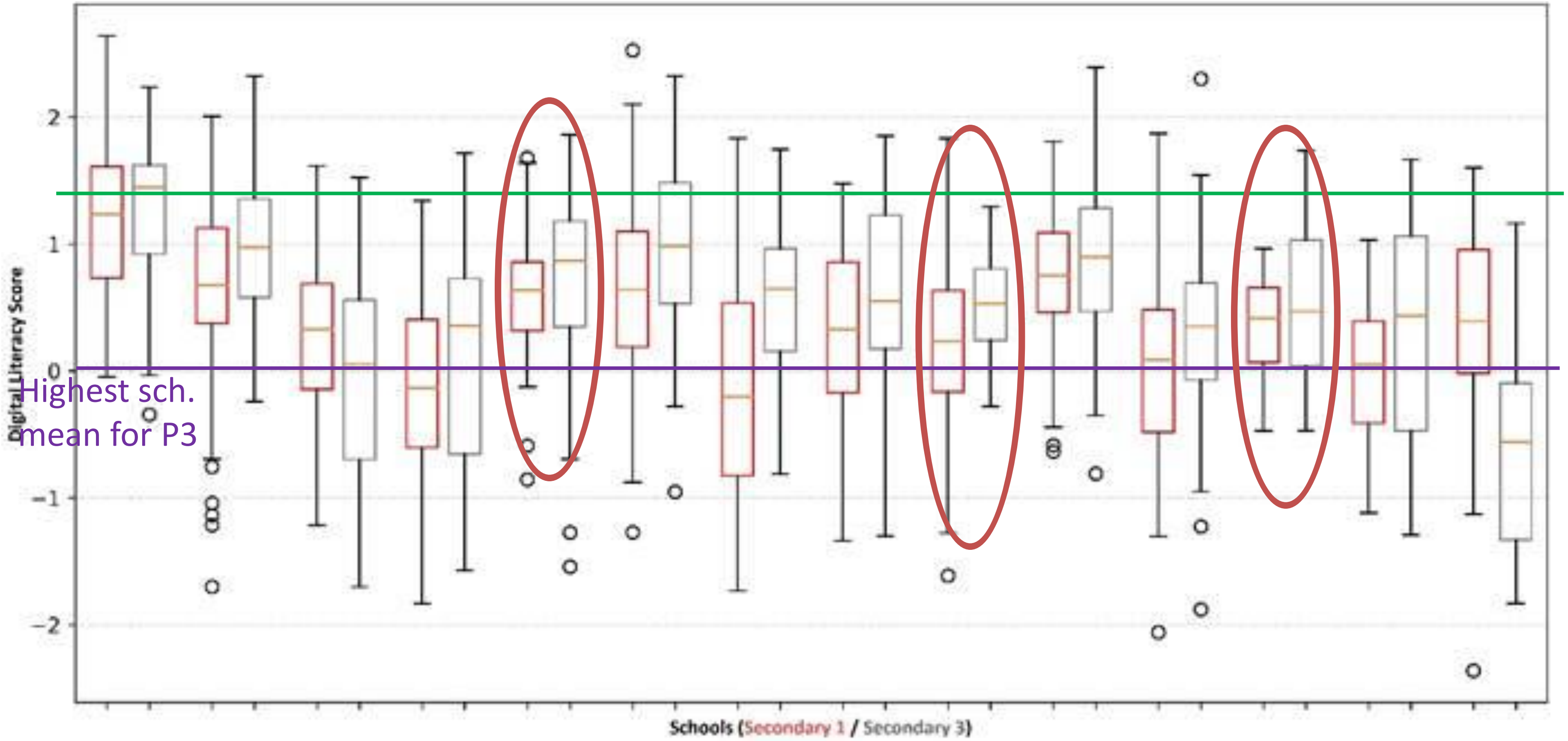


Digital Literacy @S1 & S3



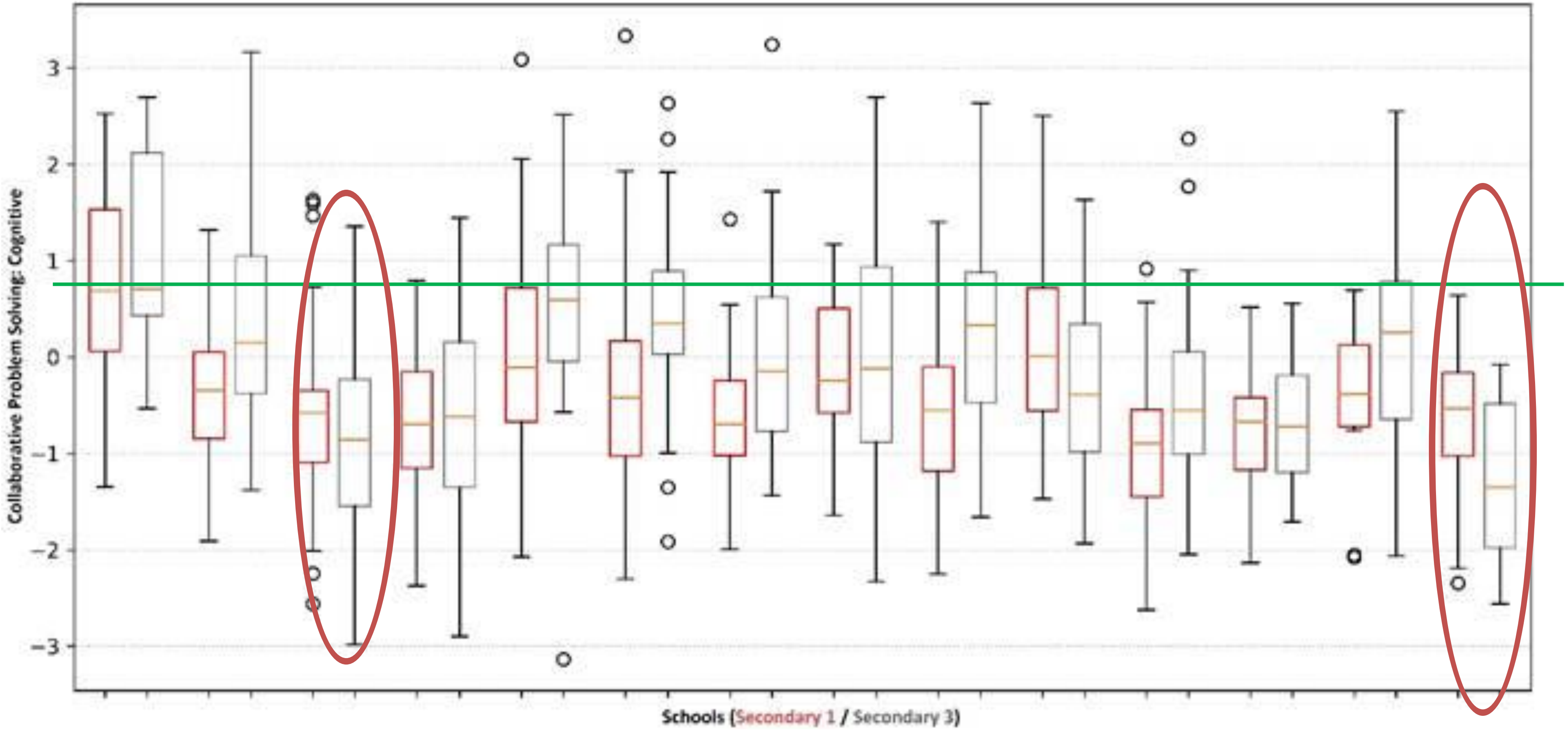
Highest sch. mean for P3

Digital Literacy @S1 & S3

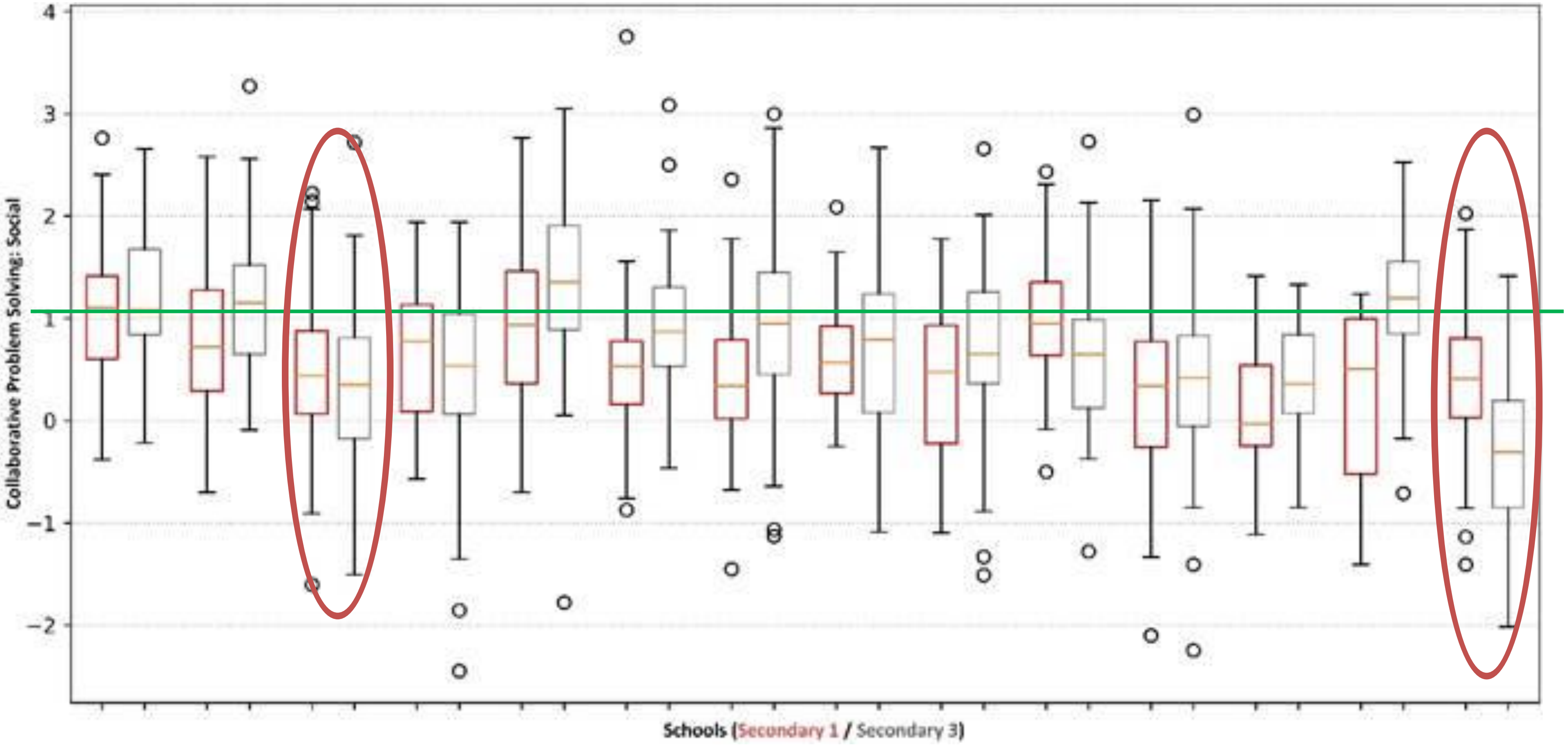


Highest sch. mean for P3

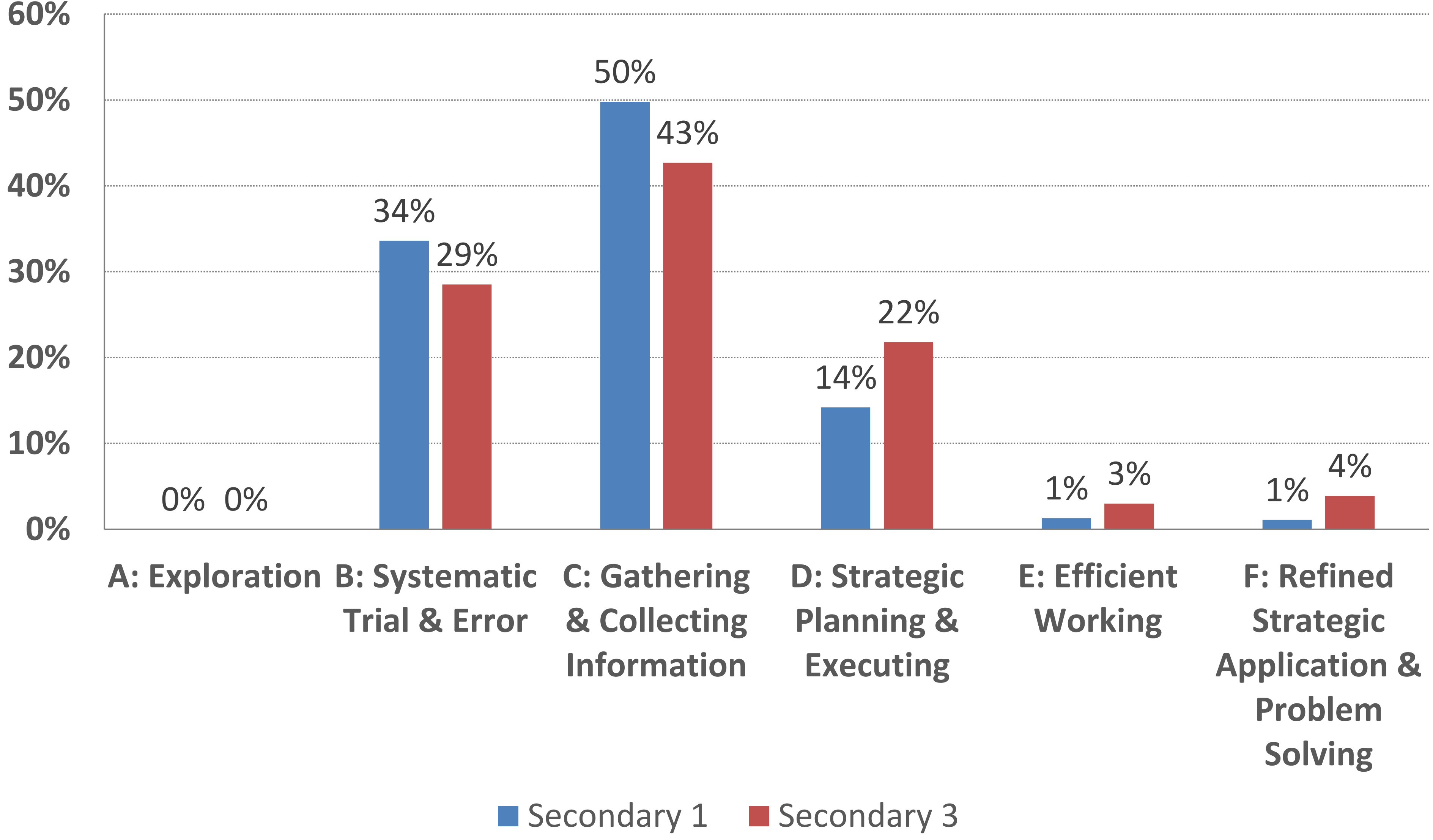
CPS—cognitive skills



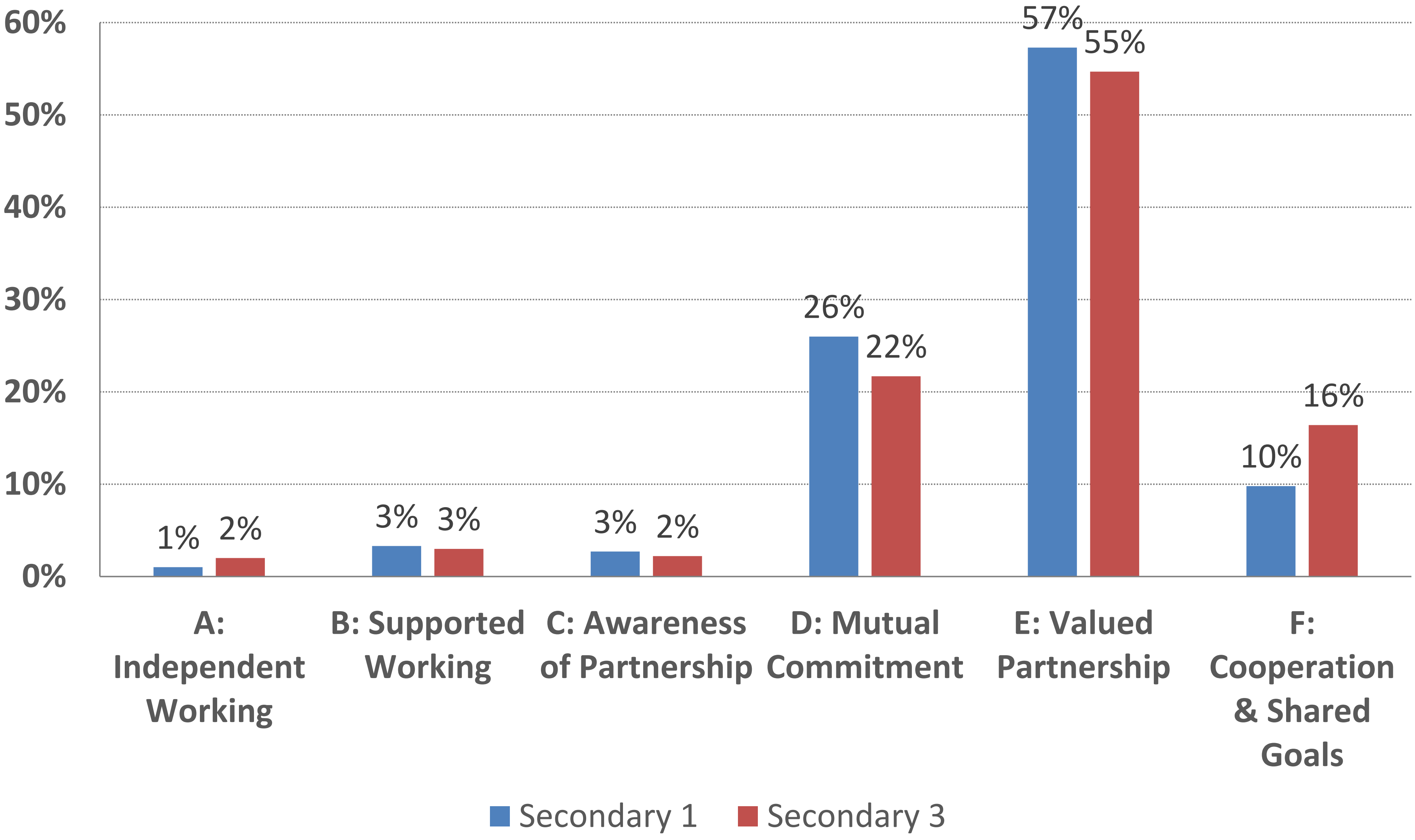
CPS—social skills



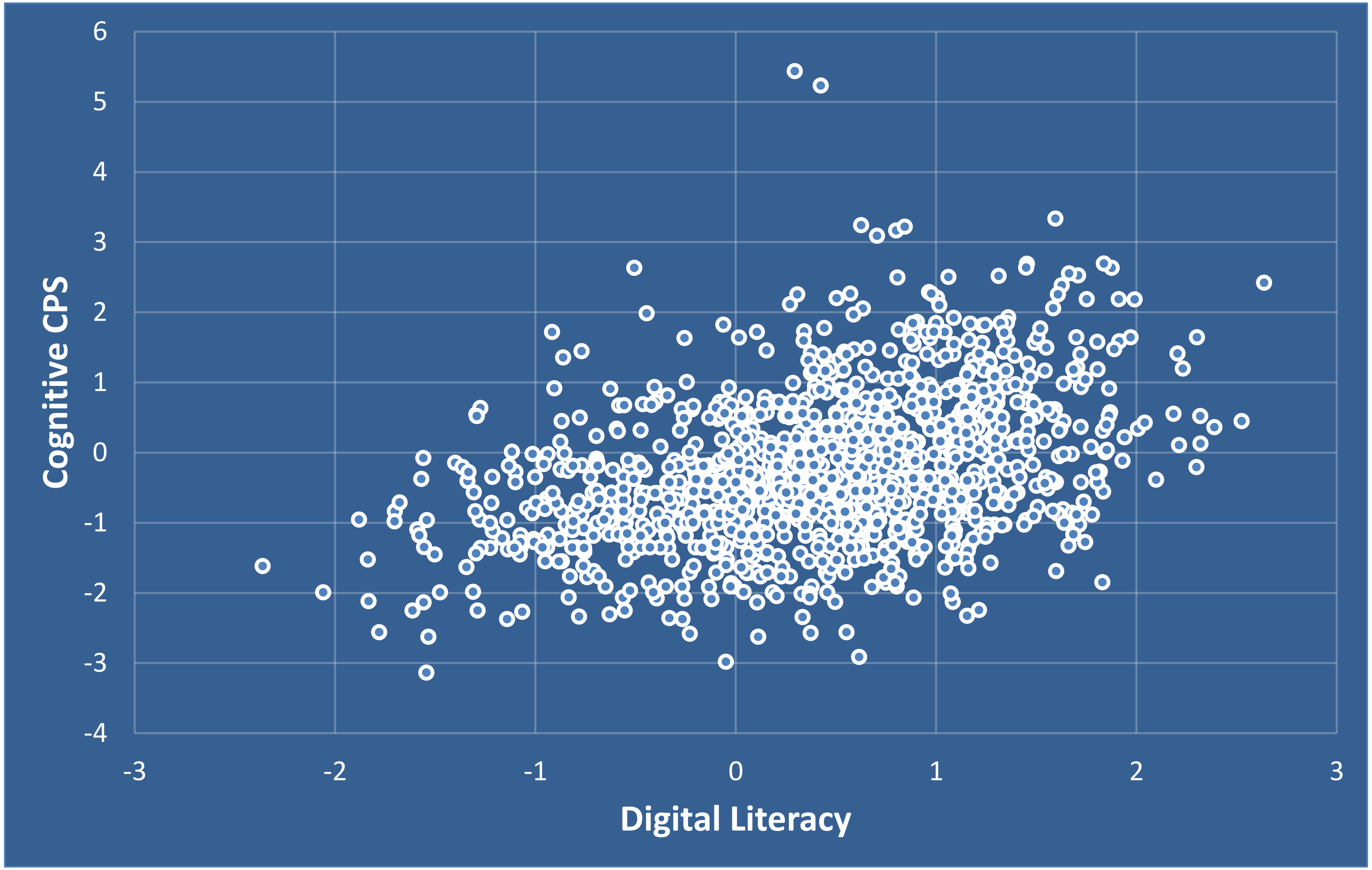
CPS: Cognitive Skills



CPS: Social Skills



DL and CPS

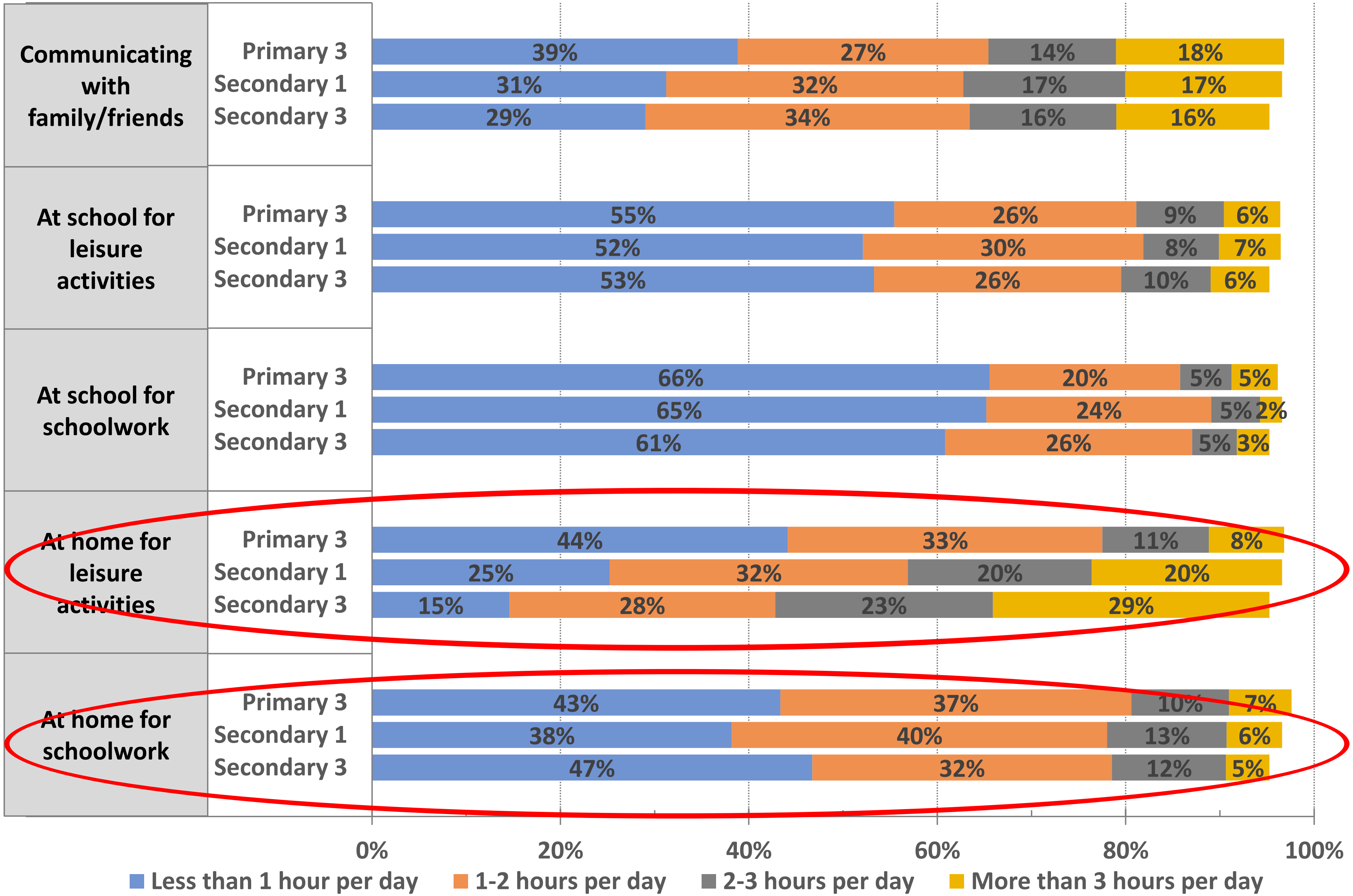


Student Survey

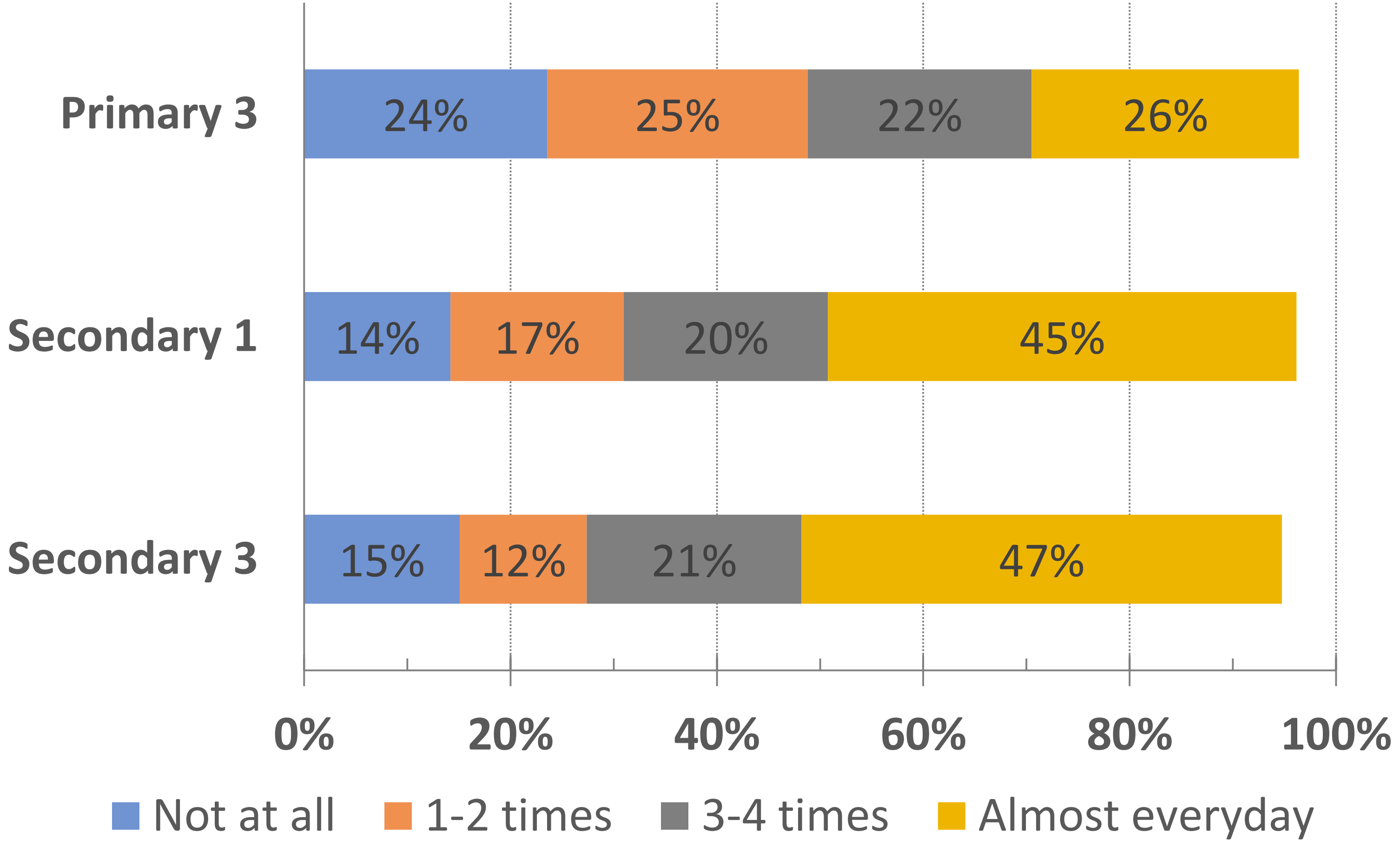
- Demographics
- Digital devices
- Offline and online health
- Parental intervention
- Digital activities and skills
- Online risks and cyberbullying
- Civic engagement

Learning and Assessment for DIGITAL CITIZENSHIP

Students’ Use of Digital Devices



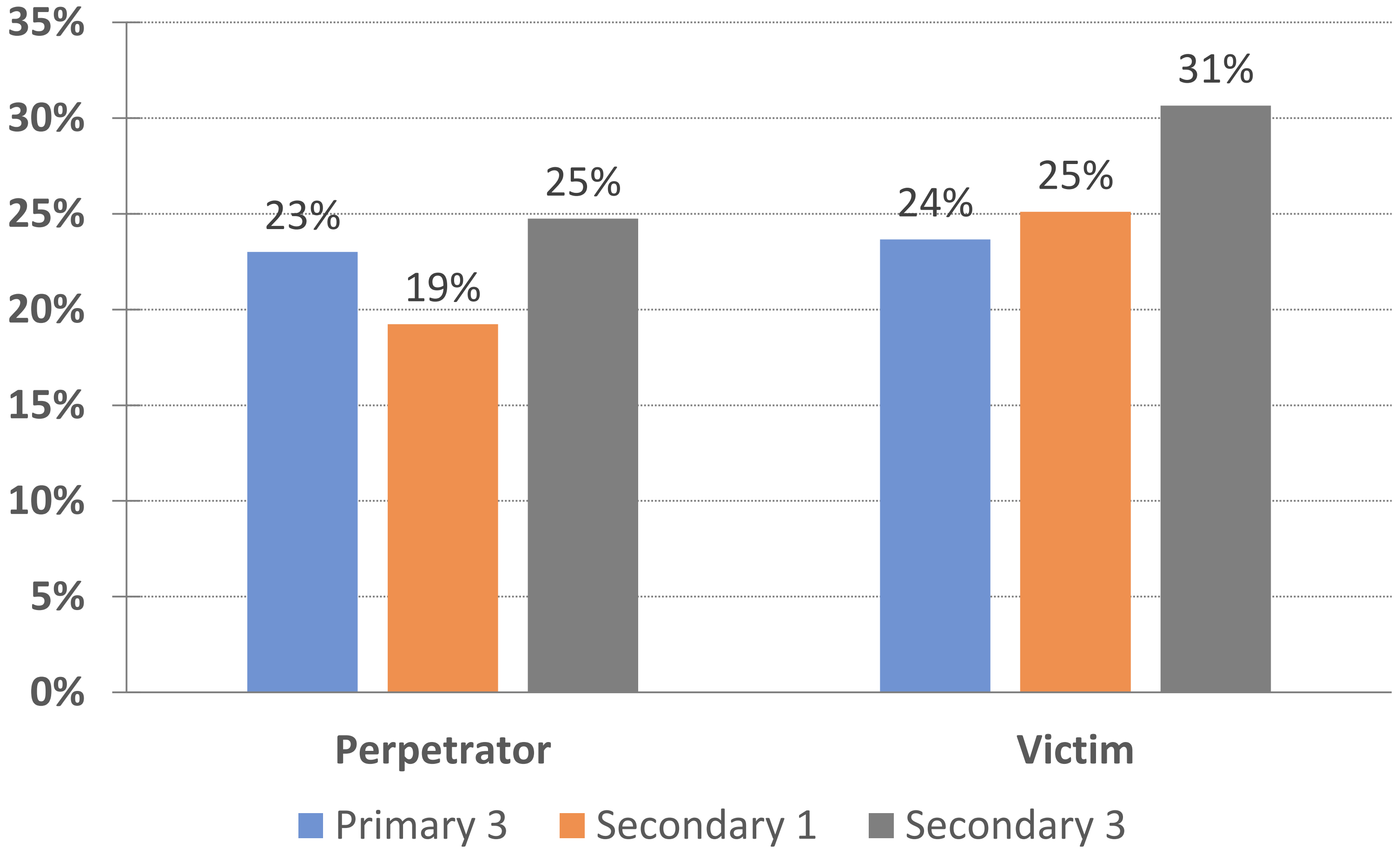
Digital Gaming



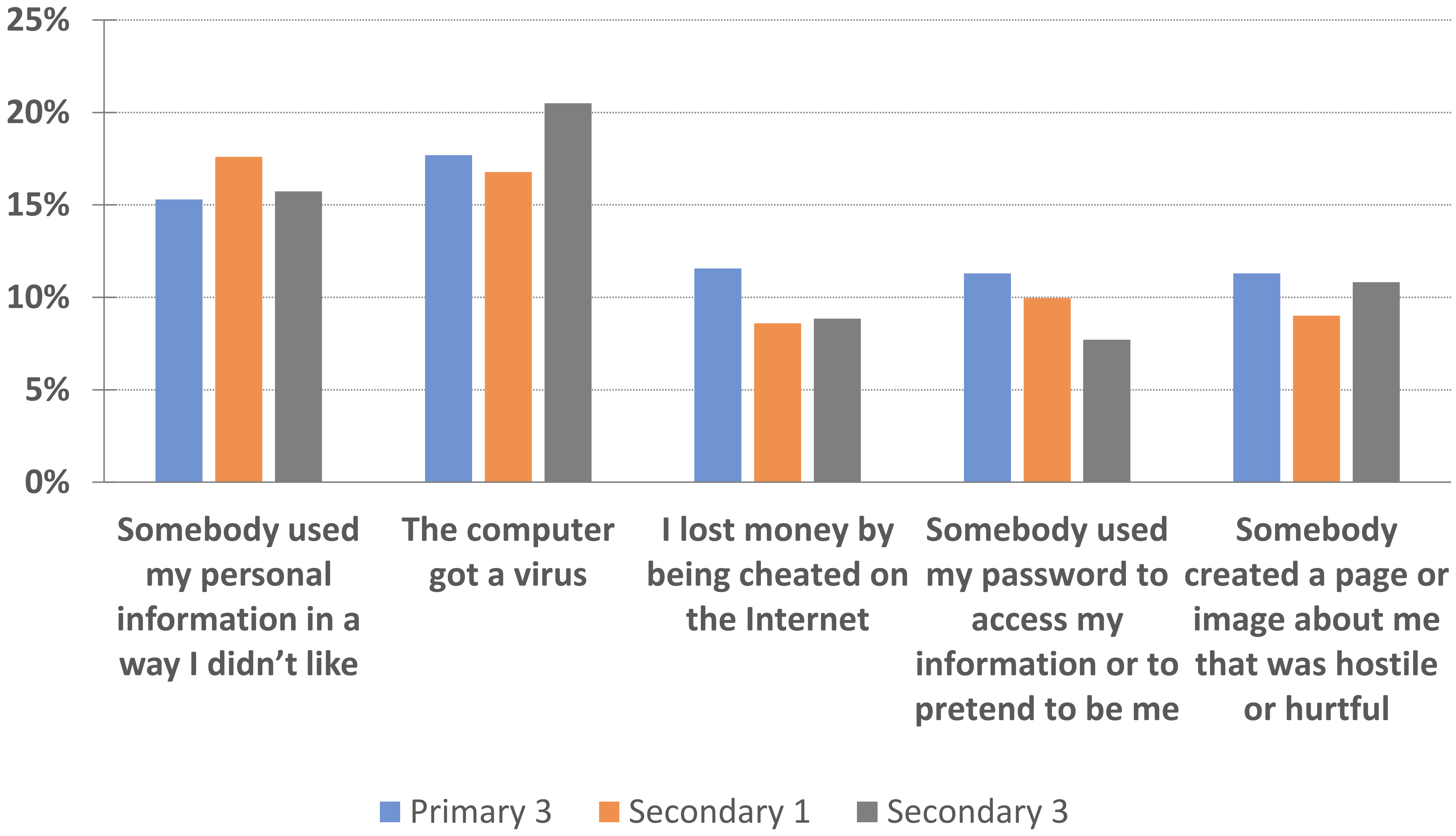
Digital Usage and DL

- Use of **digital devices at school** is associated with **lower DL performance**
- **Digital communication** with family and/or friends is associated with **better mental health**
- **Pathological gaming** is associated with **lower levels of DL** among younger students

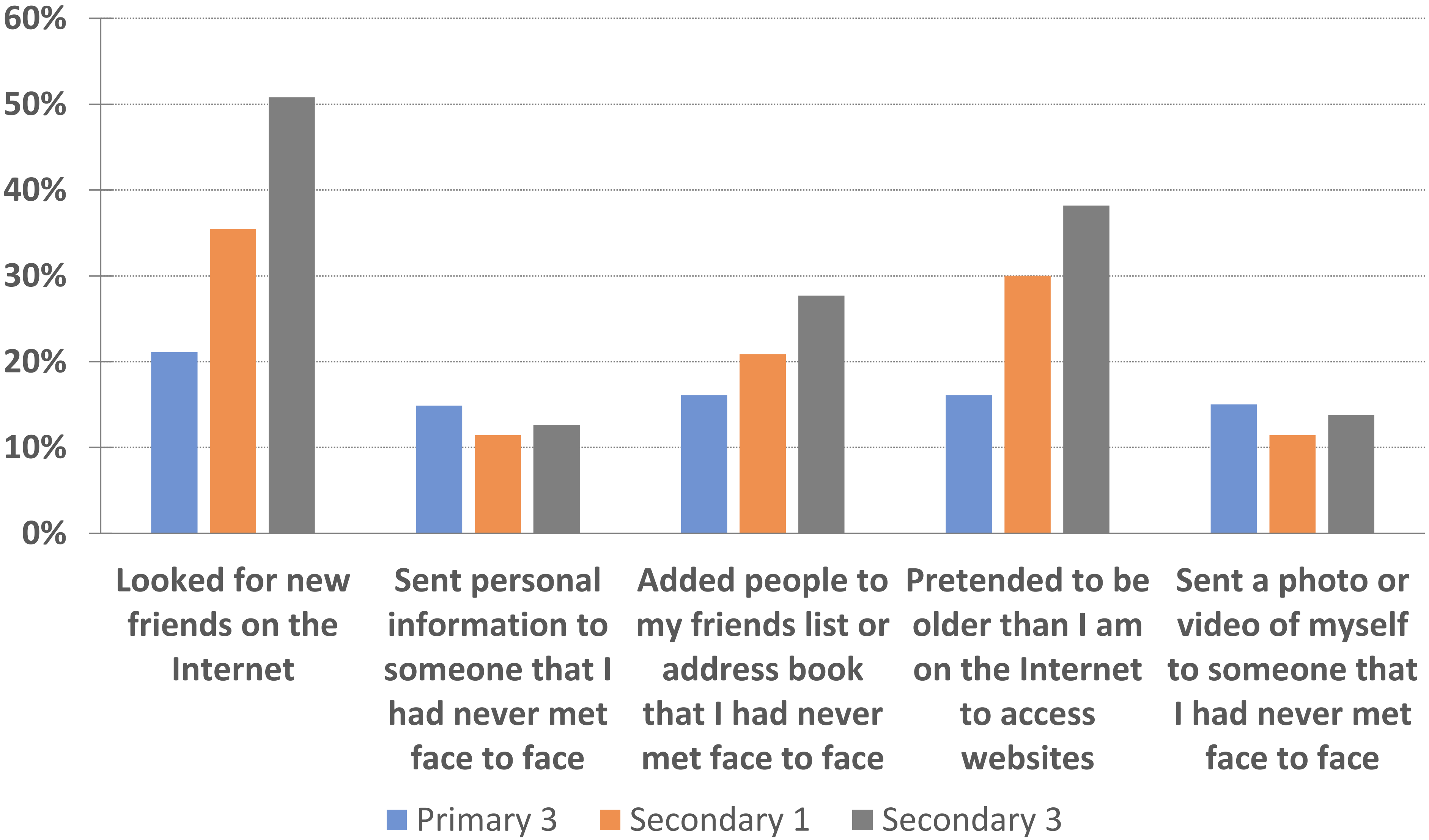
Cyberbullying



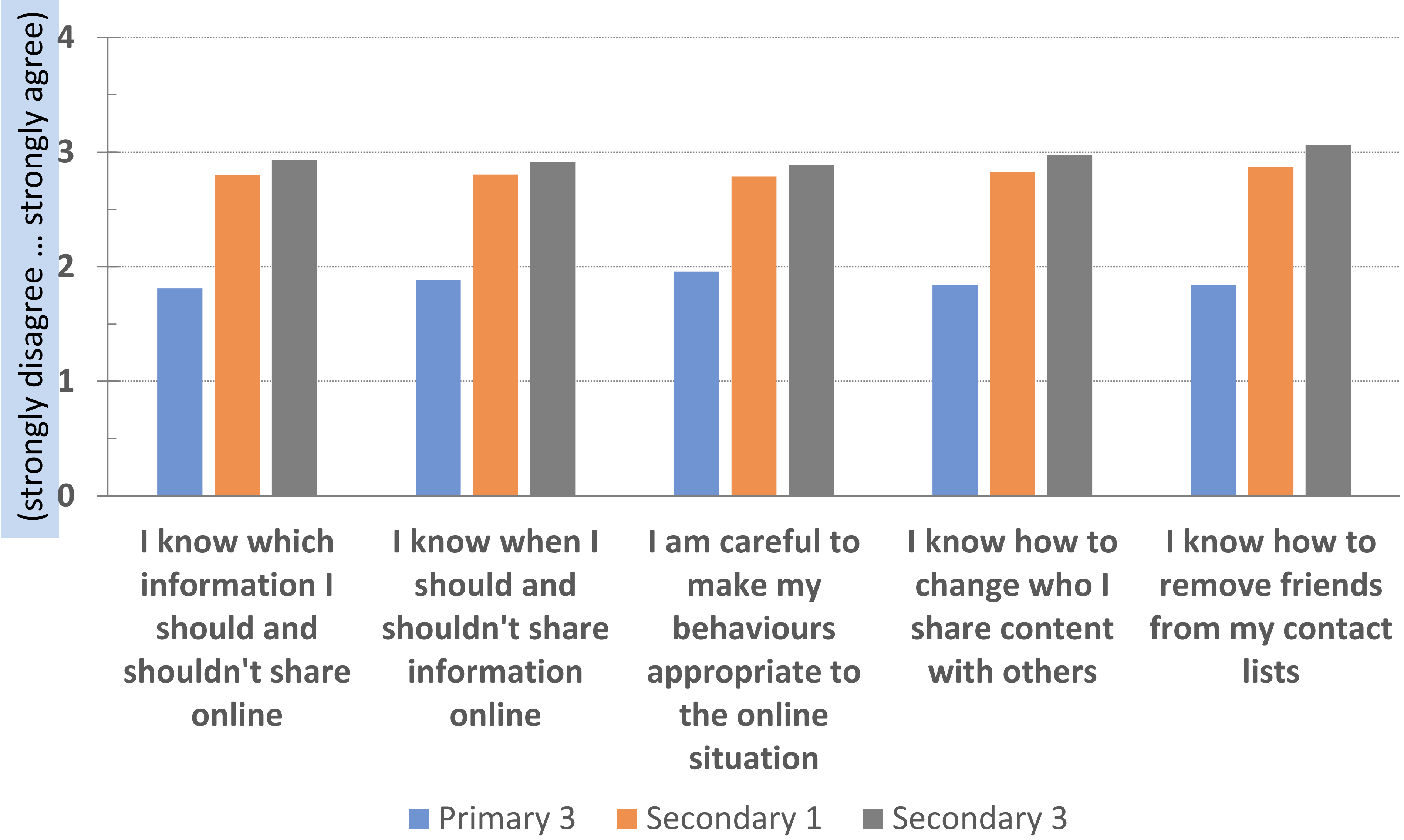
Online Security Problems



Risky Online Communication



Data Privacy Skills



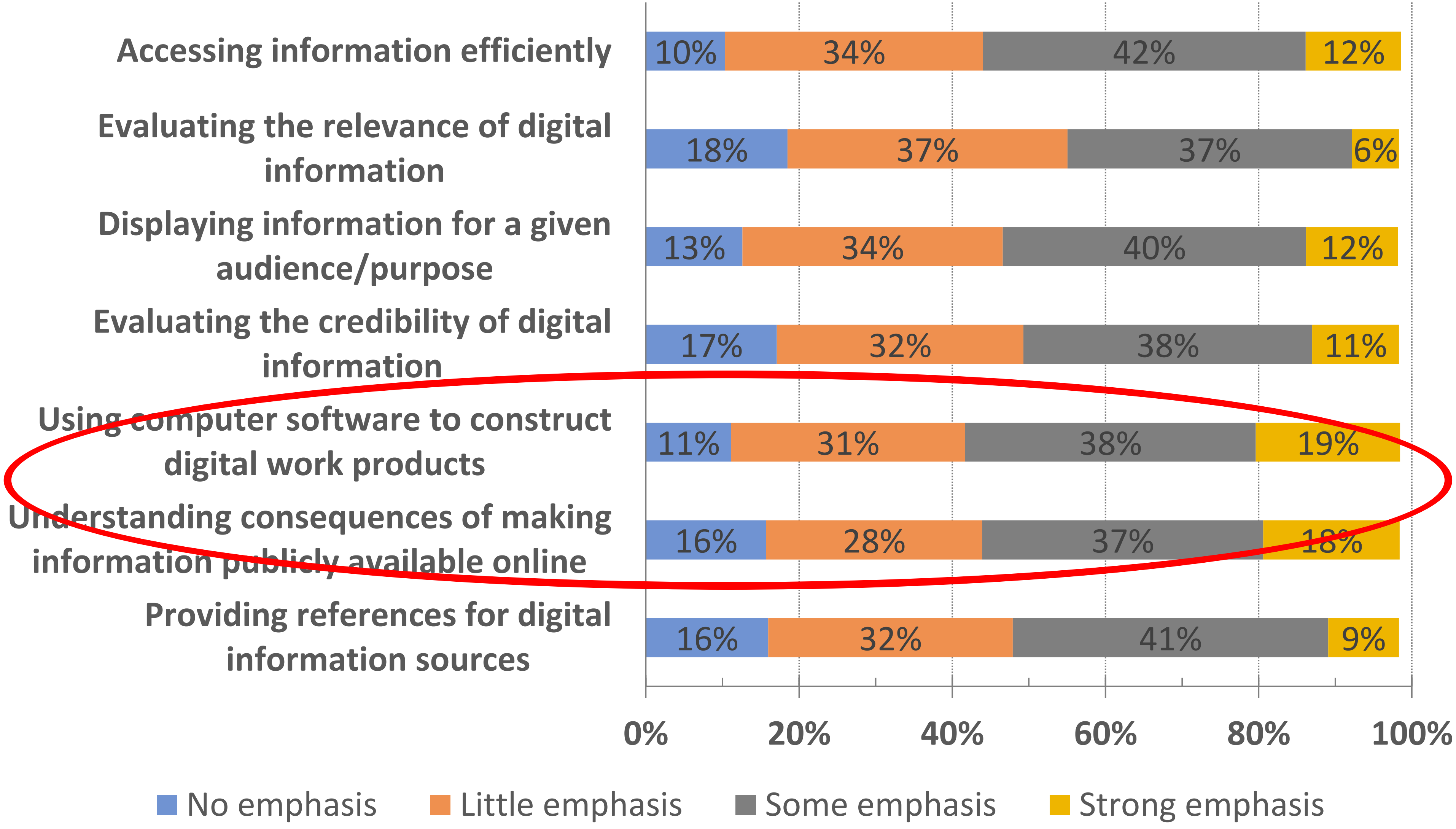
Correlations with Performance

		Security Problems	Risky Online Communication	Data Privacy
Digital Literacy	**Primary 3**	-.22*** ▼	-.28*** ▼	.26*** ▲
	Secondary 1	-.19***	-.10**	.35***
	Secondary 3	-.03	.00	.36***

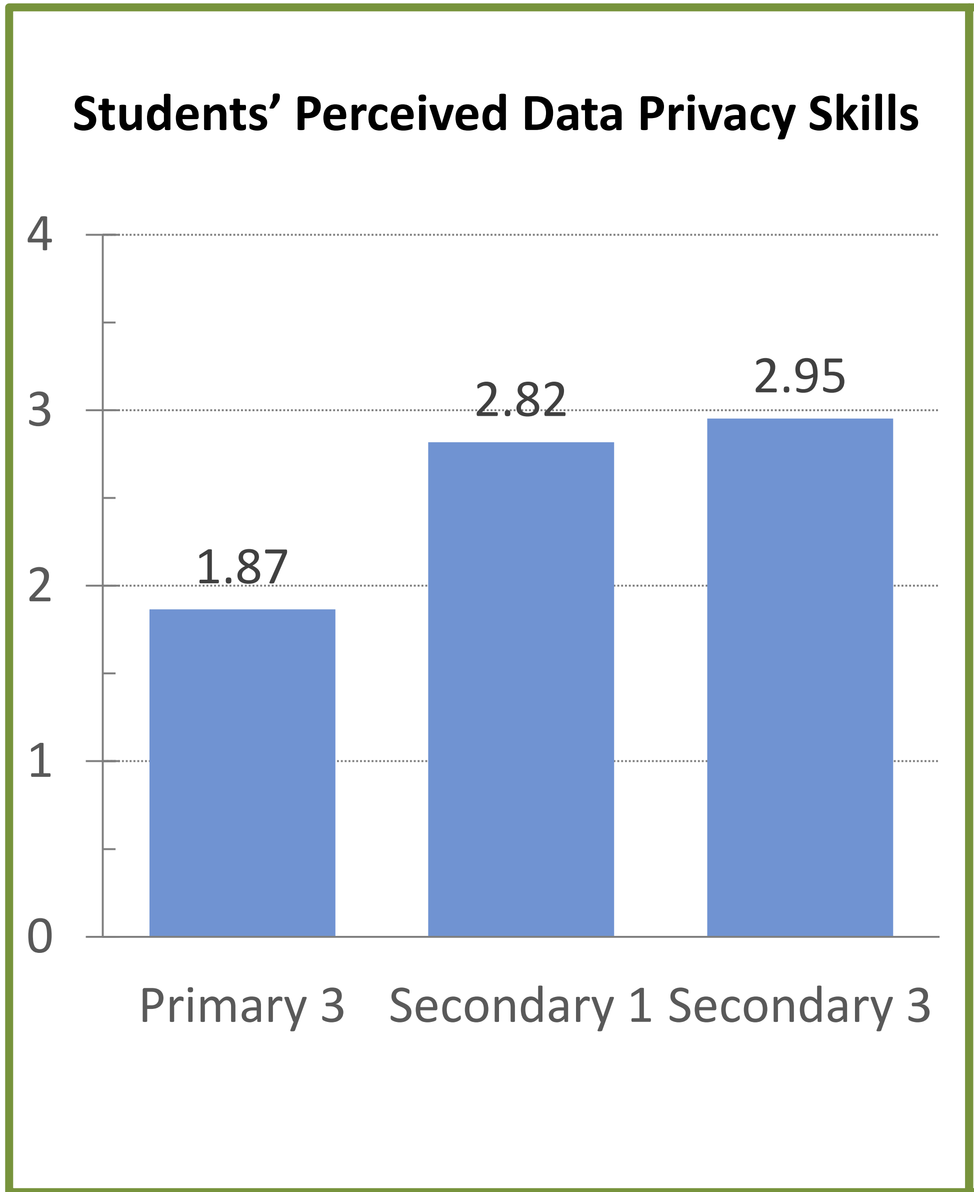
Teacher Survey

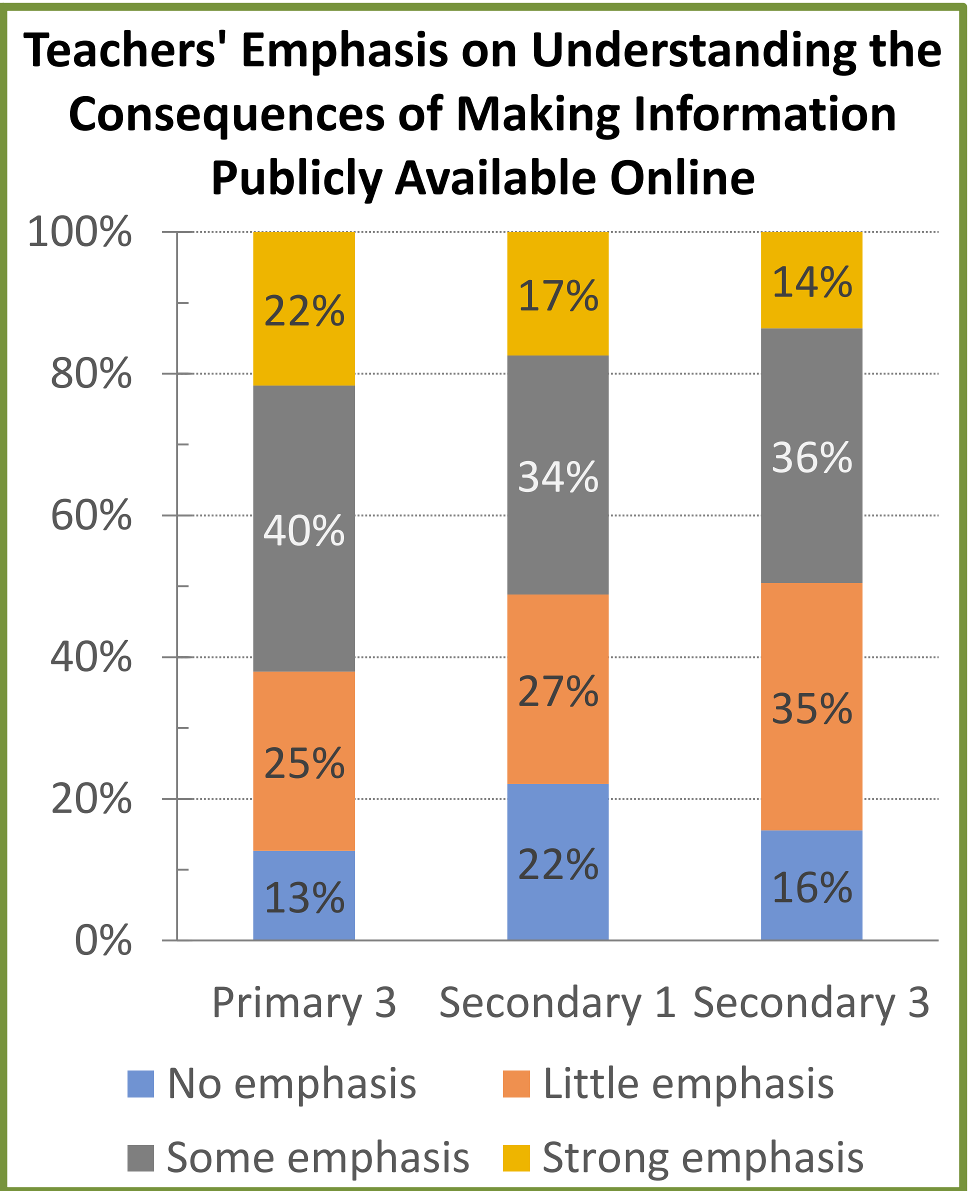
- Demographics
- Role(s) at school
- Use of ICT and emphasis on ICT capabilities
- Impact of ICT on students
- Cyber-wellness education
- Cyber-wellness and cyberbullying at school
- Civic goals at school
- Social network

Emphasis on ICT Capabilities

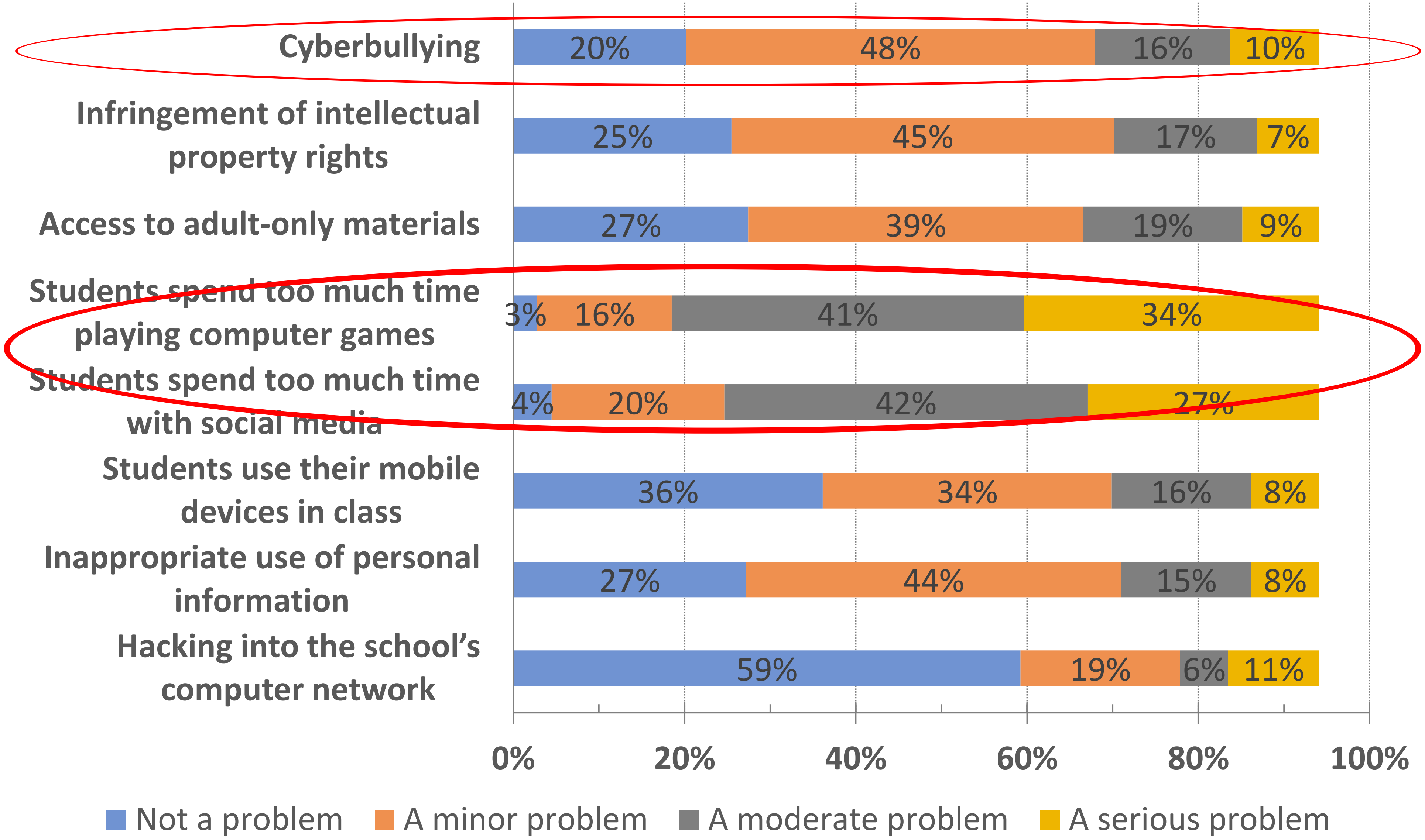


Data Privacy

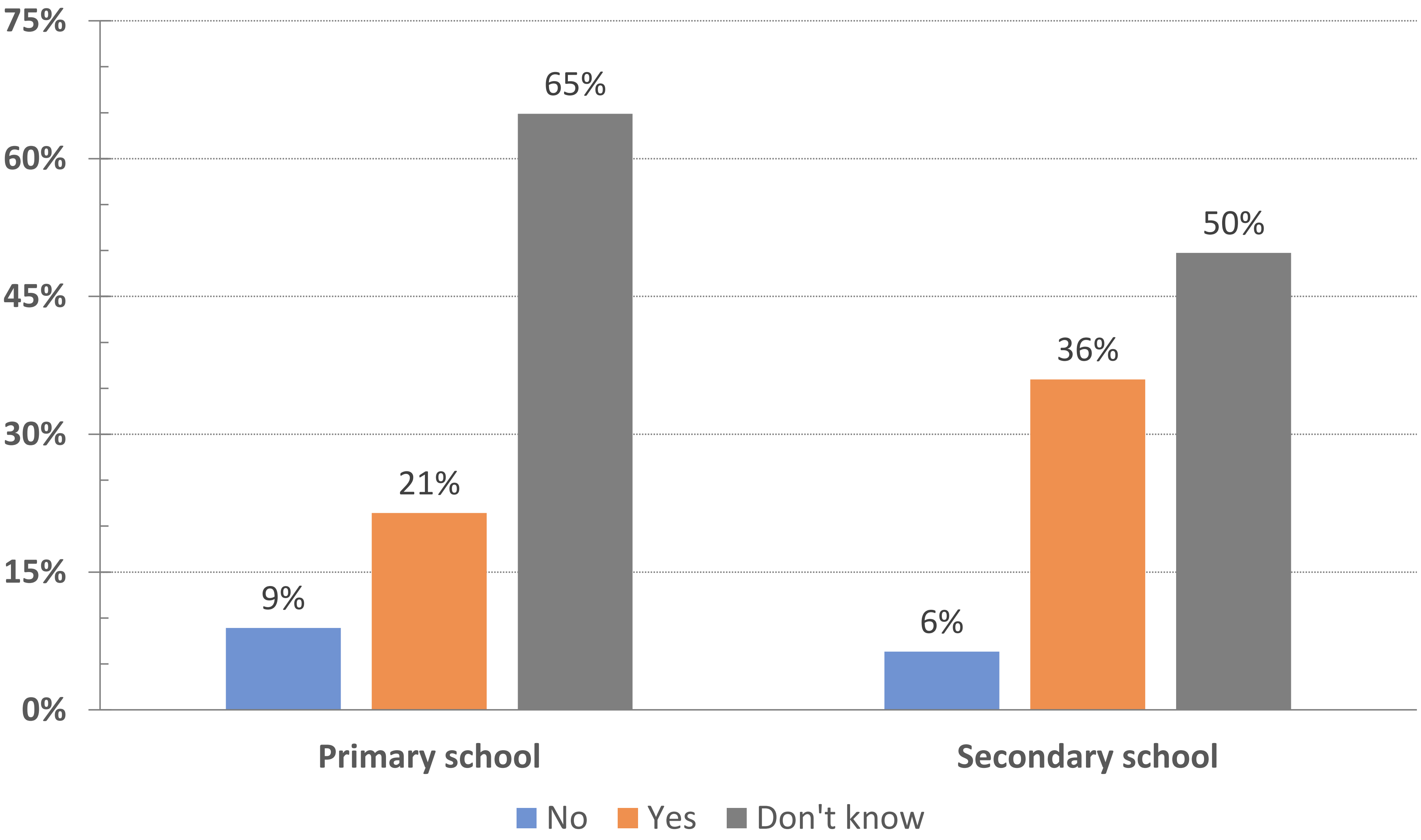




School Problems

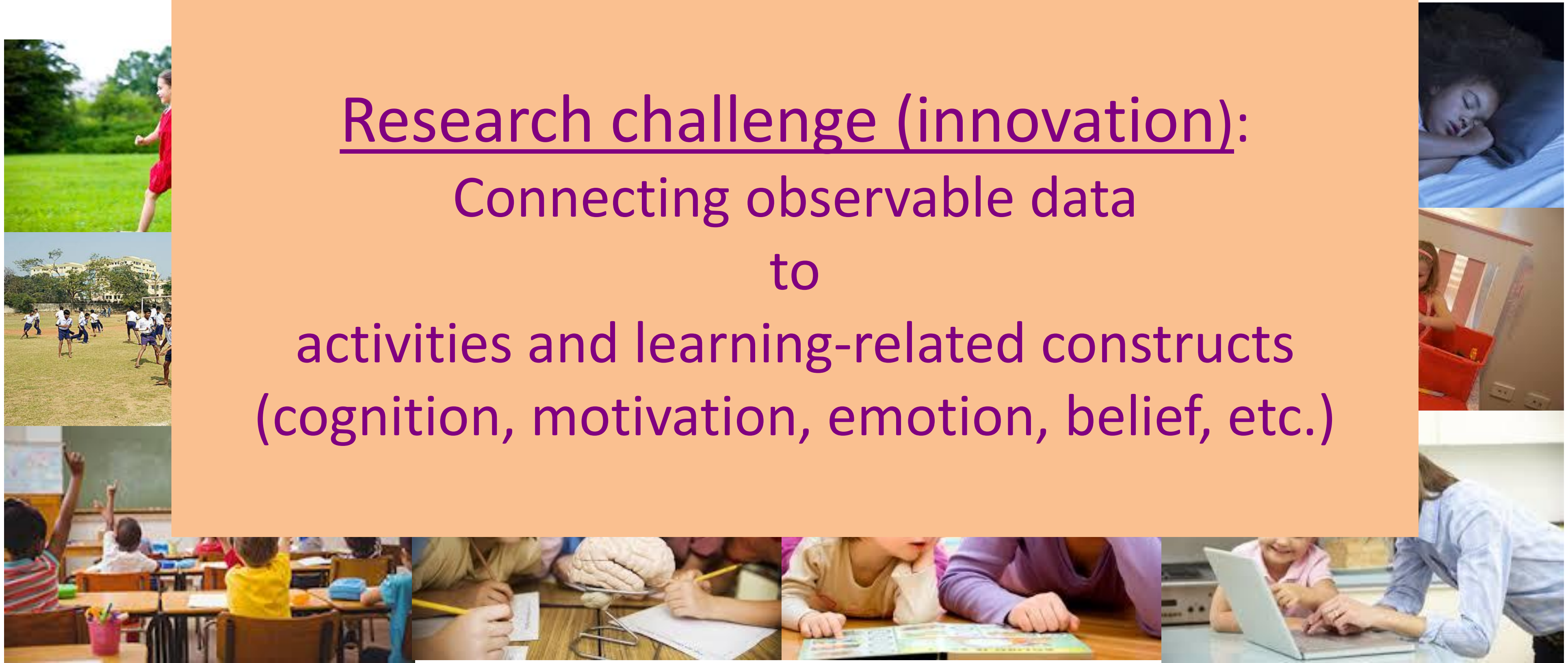


Cyberbullying Policy



Learning lives & Digital citizenship

In addition to background surveys to students, teachers and principals...



Research challenge (innovation):

Connecting observable data

to

activities and learning-related constructs

(cognition, motivation, emotion, belief, etc.)

Our Studies

To make sense about context and collect contextual data, the following research approaches are explored.

- Surveys: multilevel contextual data
- Activity tracking app: digital footprint
- Location detection: classroom interaction and motion
- Wearable devices and machine learning: socioemotional states
- Anthropological observation: sociocultural dynamics

Involve significant
Conceptual, methodological and technological innovations

Smarter Online Programs

Supporting Digital Citizenship Development

數碼公民素養2019數碼領導力
（智慧規劃）課程簡介 Smart Planning

Smart planning 智慧規劃	
課程目的	1. 加強學生對電子設備使用的管理意識，從被動的電子設備消費者到智慧網絡人的轉變 (from passive consumer to critical/smart prosumer) 2. 通過每週報告及小組討論，幫助學生了解自己校內校外的學習和生活 3. 通過數據報告幫助學生設定目標，以及學生的自我反思，促進學生的正向行為 4. 培養學生的自我規劃能力
內容簡介	學習歷程歷時三個星期，我們邀請學生全程佩戴智能手錶和裝備智能手机，以及在常用電子設備上安裝數碼時間管理軟件，用影像記錄並分析學生的課堂行為。每周向學生提供學習投入情況、睡眠、活動、上網習慣的報告。
課程對象	中一及中三
學習時數	4堂
日期	2019 年4月中至6月 2019 年9月中至10月 2019 年11月至12月 2020年1月至2月

數碼公民素養2019數碼領導力（網絡智者）課程簡介 Cyberwellness

Cyber wellness 網絡智者	
課程目的	1. 教導小學生認識網絡欺凌的基本定義，不同種類的網絡欺凌行為及其應對方法 2. 通過實例讓小學生感受到受害者的痛苦，培養學生的同理心 3. 讓中學生反思網上社交平台的角色、自己的習慣以及對自己的影響 4. 評估及分析在網上社交平台分享資料的好壞處，訓練中學生的明辨（批判）性思考能力
內容簡介	本課程設有小學課程及中學課程。 小學課程分為兩個部分:「學習」 及「小組活動」。學生會先以網上學習形式，學習到有關網絡欺凌的資料及其應對方法。然後以小組合作形式合同設計遊戲，以應用形式去表致深層學習的效果。 中學課程分為三堂，每堂約 45 分鐘。導師會利用不同的主題，先引導學生回顧自己過去的網絡習慣，然後透過不同的教材讓學生明白及課後討論，讓學生學習及反思各種網上社交平台上行為的利弊，從而加強學生的明辨（批判）性思考能力。
課程對象	小三至小六 及 中三至中六
學習時數	3-5小時
日期	2019 年6月至7月

數碼公民素養2019數碼領導力
（遊戲為本協作解）課程簡介 Smart Collaboration

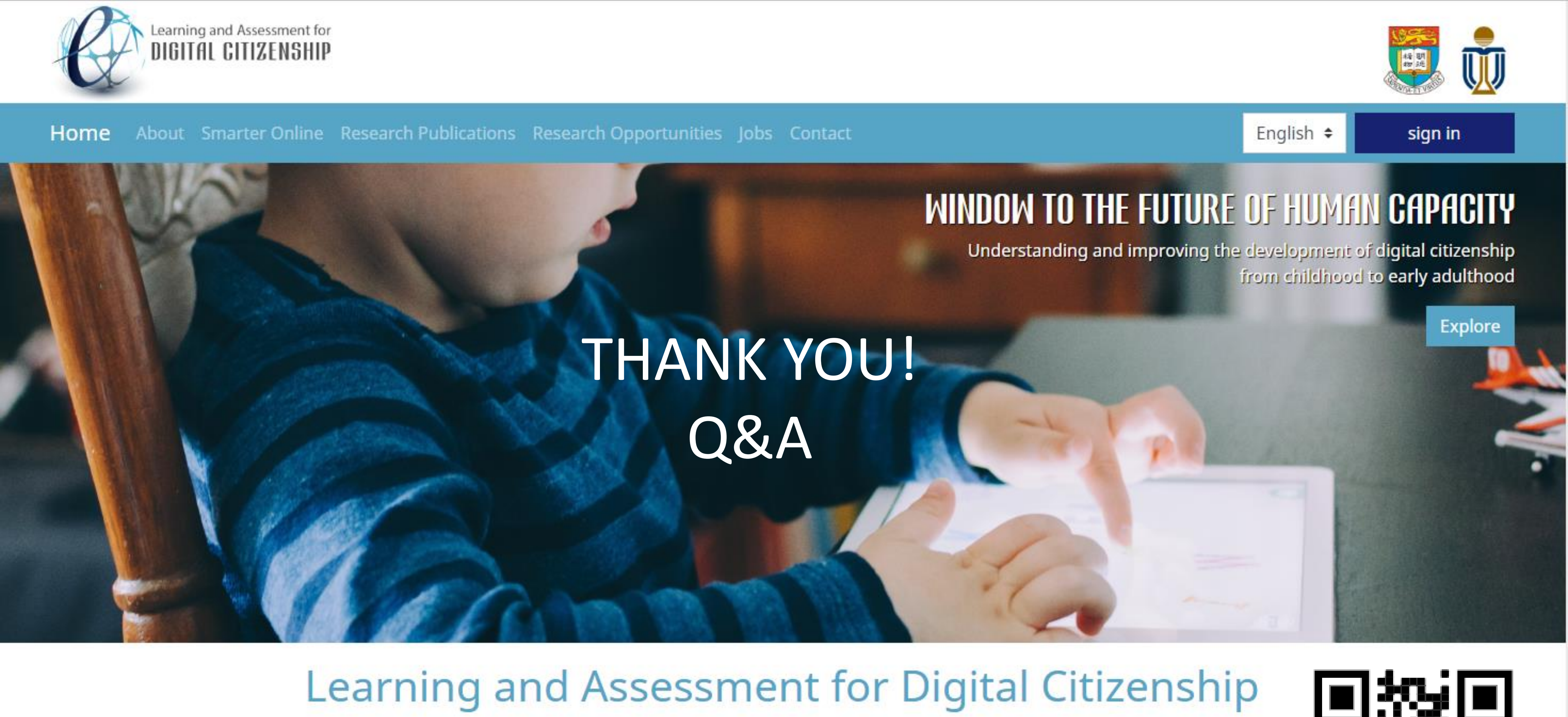
Smart collaboration 結伴同遊	
課程目的	1. 掌握團體合作解決問題的技巧 2. 認識網絡欺凌的應對方法 3. 學習如何共同設計及改良電子學習遊戲
內容簡介	整個課程會分為四個部分:「小講座」、「小組活動 1」、「小組活動2」及「反思時間」。學生會首先了解課程主題及活動內容，並以會以小組形式，在遊戲中合作解決有關於網絡欺凌的問題。遊戲完畢後，學生會在小組中討論他們對「D城市戰士」遊戲的看法及經驗，亦會反思活動中協作解決問題的表現，以及討論如何有更好的小組合作，以更深入明白團體合作的技巧。當中所提出的議見有機會被包括於「D城市戰士」遊戲的下一個發佈版本。
課程對象	小三及小四學生
學習時數	2小時
日期	2019 年5-6月

數碼公民素養2019數碼領導力（虛擬實境有效互動）課程簡介 Smart Learning in AR/VR

Smarter learning (with VR) 奇趣學習體驗	
課程目的	1. 通過虛擬實境，令學生身臨其境，加強學生的體驗感及真實感，彌補課文所帶來的距離感 2. 通過擴大演講者的表情，增加聽眾之間的情感傳遞，從而加強演講的感染力及聽眾的投入度 3. 增強學生對學習的參與度及動力
內容簡介	虛擬實境 (Virtual reality, VR) 技術為3D虛擬空間帶來嶄新體驗，增強身臨其境的體驗令學習、設計及分享資訊更為有效。整個課程會分為三個部分:「簡介」、「故事設計」及「VR體驗」。課程利用了名為Live Emoji 的新技術去捕獲演講者的面部信息，並即時轉移到實時控制的虛擬化身(virtual agent/avatar)身上，利用個性化多模態效果(personalized multimodal effect)來增強VR中的參與度。通過這種方式，演講者可以更有效地傳遞情感，同時觀眾可以感受更真實的情感體驗。 *註: 因裝置所限，戴上虛擬實境眼鏡的學生，將無法同時戴上自己的眼鏡。
課程對象	中一及中三
學習時數	2 小時
日期	2019 年4月12, 13　(如需平日進行, 日子可另行協商)

數碼公民素養2019數碼領導力
（運算思維）課程簡介 Computational Thinking

Green Creativity 綠創先機	
課程目的	1. 向教師及中、小學生推廣運算思維(computational thinking)及應用程式編程(computer programming)知識 2. 鼓勵學生發揮創意，及利用運算思維設計切合主題的應用程式 3. 培養學生對環境可持續發展課題的關注，並增進相關知識 4. 讓學生有機會和家人一同解決問題，促進家庭和諧關係
內容簡介	本計劃以學習歷程的形式，為學生提供有趣的運算思維及編程學習體驗。學習歷程是由「學習」及「挑戰賽」部分組成，課程運用MIT App Inventor程式編程，學生可透過本計劃特設的網上課程和學生工作坊，按自己的進度，由零開始學習編程。完成課程後，學生可參與挑戰賽展示學習成果，挑戰賽將定於四月舉行，優勝組別可獲精美獎品一份，以及免費修讀科大暑期學分課程。
課程對象	中一及中三
學習時數	網上課程（按學生進度, 約兩小時）及兩個師生工作坊（每個約一小時）
日期	學習課程2019年11月至2020年3月 挑戰賽2020年4月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THANK YOU!
Q&A

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