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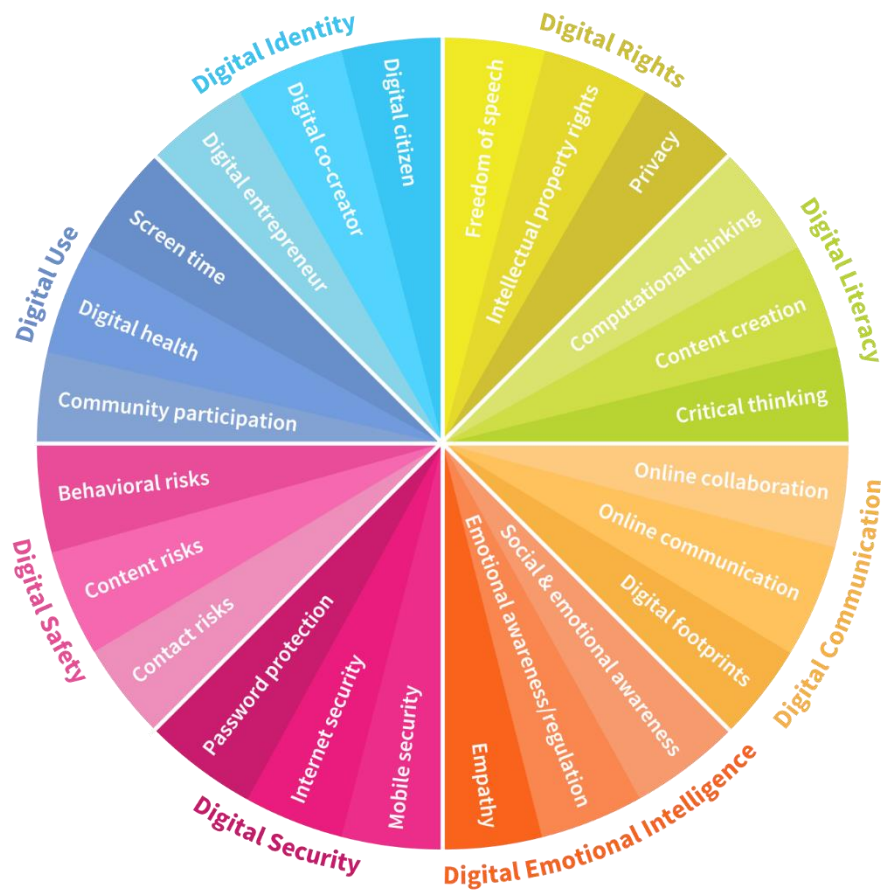
Digital Intelligence (DQ)

A Conceptual Framework & Methodology for Teaching and Measuring Digital Citizenship

August 2017

Contents

Background

We are living in a renaissance period of new digital media and technologies that are reshaping the world around us. A wide and growing cross-section of the world's population has become immersed in this hyper-connected digital world, in turn transforming the ways we communicate and interact. At the same time, as digital media and technology become an indispensable part of our daily lives, there is growing concern that we are losing control as our dependence on technology grows. Digital issues caused by this 24/7 hyper-connected culture –including technology addiction, cyberbullying, online sexual behaviors, cybercrimes, online privacy concerns – are proliferating and significantly impact daily life.

Unfortunately, our children are the most vulnerable and critical societal group that is affected by these digital issues. Children do not own their online privacy even before they start using digital devices, and they are not properly equipped to manage their privacy afterwards. Personal information such as private photos or medical and educational information is shared online by their own parents who do not realize the long-term impact that this online presence can have. Children's information is also often automatically included in cloud storage platforms without a clear understanding of the implications. At present, 94% of 9-16 year olds regularly access the Internet, and more than 50% of them own smart phones and use social media by 9 years old. Nearly all children who participate in digital media share information without understanding their privacy rights. Moreover, early digital media usage increases the likelihood of being exposed to various cyber risks without being afforded sufficient protection and awareness.

As such, there is a global imperative to empower children to become good digital citizens who are smart and responsible users of technology – avoiding harmful and risky activities while maximizing the benefits of technology use.

In order to address this urgent need, the Digital Intelligence concept was developed. Digital intelligence or "DQ" is a set of skills needed to meet the demands and challenges of the digital world, including digital citizenship and literacy skills.

Digital Intelligence (DQ) Framework

A generation ago, IT and digital media were niche skills. Today, they are core competencies that are necessary to succeed in most careers. For this reason, digital skills are an essential part of a comprehensive educational framework. Without a national digital education program, command of and access to technology will be distributed unevenly, exacerbating inequality and hindering socio-economic mobility. The challenge for educators is to move beyond seeing IT as simply a collection of software and hardware tools or mediums of delivery ("IT-enabled education platforms"). Instead, the goal should be to nurture children's abilities and confidence levels to excel in a world where digital media is an integral part of everyday life.

Like IQ or EQ, which are measures of general and emotional intelligence, an individual's facility and command of digital media (DQ) is a competency that can be measured. The good news is that DQ is a competency that is highly learnable.

DQ can be broken down into three levels:

- **Level 1: Digital citizenship**
  The ability to use digital technology and media in safe, responsible and effective ways.
- **Level 2: Digital creativity**
  The ability to become a part of the digital ecosystem by co-creating new content and turning ideas into reality by using digital tools.
- **Level 3: Digital entrepreneurship**
  The ability to use digital media and technologies to solve global challenges and create new opportunities.

DQ Digital Citizenship: Fundamental digital competency our children must learn

The fundamental competency of DQ is digital citizenship (DQ Digital Citizenship), which is a set of abilities that enables one to make discerning and deliberate choices that maximize the benefits of technology while mitigating cyber risks. It is fundamental to a person's ability to use technology and live happily, successfully, and responsibly in the digital world. These abilities can be further broken down into eight DQ Digital Citizenship Competencies:

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- Digital citizen identity: the ability to build and manage a healthy identity online and offline with integrity.
- Screen time management: the ability to manage one's screen time, multitasking, and participation in online games and social media with self-control.
- Cyberbullying management: the ability to detect situations of cyberbullying and handle them wisely.
- Cybersecurity management: the ability to protect one's data by creating strong passwords and to manage various cyber-attacks.
- Privacy management: the ability to discretely handle all personal information shared online in order to protect one's and others' privacy.
- Critical thinking: the ability to distinguish between true and false information, good and harmful content, and trustworthy and questionable contacts online.
- Digital footprints: the ability to understand the nature of digital footprints and their real-life consequences and to manage them responsibly.
- Digital empathy: the ability to show empathy towards one's own and others' needs and feelings online.

Figure 1: DQ Digital Citizenship Framework

Importantly, the acquisition of these abilities is rooted in human values such as respect, empathy, and discernment. These values facilitate the responsible use of technology – attributes that will serve the digital citizens of tomorrow well.

Constructs of DQ Digital Citizenship Competency

Each competency has three components comprised of knowledge, skills and attitude/behaviors/values. For instance, digital citizen identity consists of knowledge of digital media and technology, skills to build ones' digital identity to be consistent with their offline identity in the framework of global citizenship, and attitude/behaviors/values of self-efficacy and integrity. Table 1 summarizes the related constructs of each DQ digital citizenship competency.

Table 1: Knowledge, Skills, Attitude/Behaviors/Values of DQ Digital Citizenship Competency

Competency	Knowledge	Skills	Attitude/Behaviors/Values
Digital Citizen Identity	Knowledge of digital media and technology	• Skills to build ones' digital identity to be consistent with their offline identity • Global citizenship	• Congruence between online and offline behaviors • Integrity • Self-efficacy
Screen Time Management:	Knowledge about screen time, multi-tasking, and impact on their development	• Time management skills	• Screen time and digital media usage habits • Self-regulation
Cyberbullying Management	Knowledge about cyber bullying and its impact on relationships	• Skills to regulate emotions • Skills to deal with cyberbullying incidences	• Cyber-bullying involvement behaviors • Attitude toward cyber-bullying acts • Kindness
Cybersecurity Management	Cybersecurity knowledge	• Skills to make strong passwords and keep them safely • Skills to detect and deal with cyber threats (*e.g.*, SCAM/SPAM/Phishing)	• Cybersecurity behaviors • Cybersecurity attitudes
Privacy Management	Knowledge of personal information and privacy	• Skills to protect personal data of themselves and others • Skills to manage	• Behaviors on personal information sharing • Attitudes toward personal information sharing

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		privacy settings on social media	• Respect
Critical Thinking	Media and information literacy knowledge	• Skills to detect false information and news • Skills to block unwanted contacts • Skills to block violent and inappropriate contents	• Media usage behavior and attitudes • Evaluation of online information • Usage of violent and/or sexual online content • Chatting and meeting with online strangers
Digital Footprint Management	Knowledge of digital footprints and reputations	• Skills to control digital footprints and reputations	• Digital footprint behaviors • Digital footprint attitudes
Digital Empathy	Knowledge of empathy Mechanism of online trolls	• Skills to communicate online in non-judgmental and empathetic ways	• Empathy

This collective set of digital citizenship competencies will enable children to not only deal with the challenges and demands of their digital lives, but also take responsibility in their digital communities and create value in the digital economy.

It will lead to enhancing the resilience of individuals and organizations, the sustainability of digital environments with trust and transparency among stakeholders and, lastly, igniting the growth engines needed to catalyze new heights of digital innovation. Ultimately, it will heighten the well-being of individuals and communities, ensure the security of our societies, and enhance the economic benefits of nations.

DQ aligns well with the OECD Future Learning Framework 2030 that aims to provide a conceptual framework to understand future core competencies for children to be equipped with in order to achieve individual and societal well-being.

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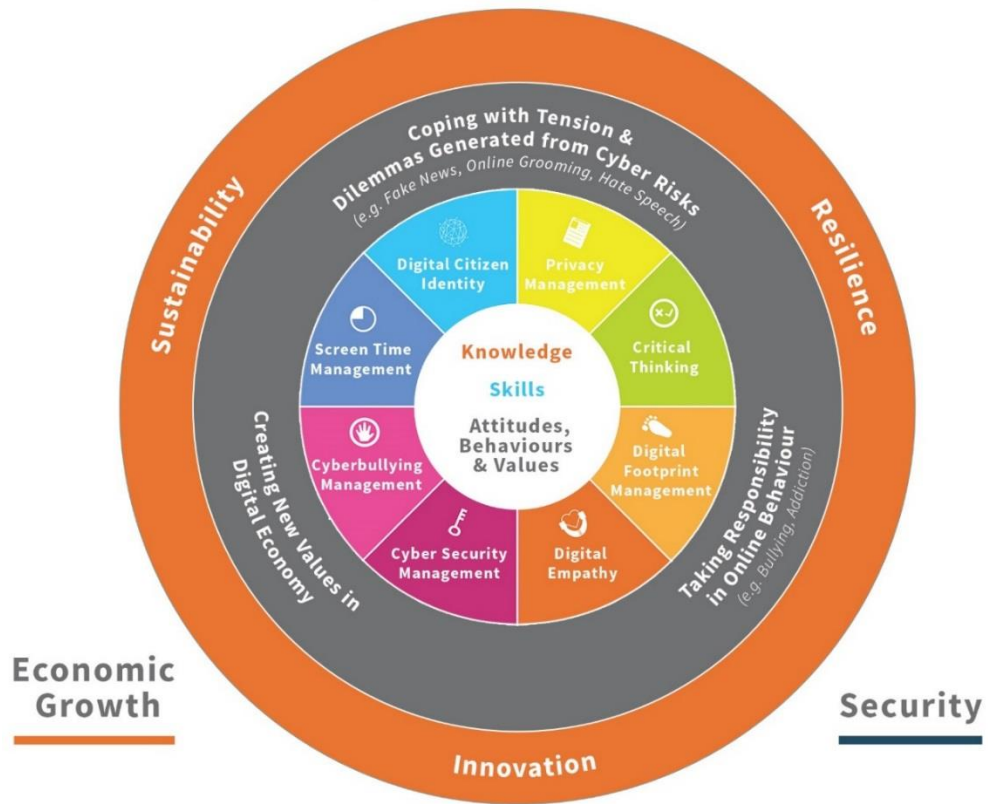Leading Digital Education, Culture, and Innovation

Figure 2: Alignment with the OECD Future Learning 2030 Framework

#DQEveryChild:
National Implementation of DQ Digital Citizenship Education

Despite its importance, the concept of digital citizenship has often been overlooked by educators and leaders. Due to the digital generation gap, with young children being the first to grow up in the era of smartphones and social media, neither parents nor teachers know how to adequately equip children with these skills.

Digital transformation is a key part of the national agenda for many countries. The major element of digital transformation is to build a comprehensive set of digital competencies for children worldwide by implementing DQ education across public and private education systems. National leaders need to understand the importance of digital citizenship as the foundation of digital intelligence. Instilling digital competencies in children should start with building civic values and identity formation in the digital world, leading to practical skills for job readiness and positive social communication. National education leaders should make it a priority to implement digital citizenship programs as part of a comprehensive digital education framework.

It is recommended that nations construct a master plan for building a digital education curriculum that is aligned with global standards such as those outlined in DQ digital citizenship and its set of competencies. Currently, many curriculums tend to focus on practical coding skills or digital literacy. However, it is critically important that national education plans become more holistic and prepare children for the growing impact of digital technologies on daily life. Such developments present a challenge for educators who do not have deep knowledge of the digital competencies needed for DQ skills training. Likewise, heavy teaching schedules limit flexibility to find and use suitable resources and tools.

Therefore, it is important that digital education practices are not only aligned with the latest technological advances and issues, but also bring tested and proven educational programs to national curriculums and provide the right tools and resources for educators. It is highly recommended that nations should forge private-public-civic collaborations that bring together the latest high-quality educational contents and programs developed by the private and civic sectors.

#DQEveryChild is a unique global education movement developed by the DQ Coalition, including the World Economic Forum, governments, leading NGOs, academic researchers, and ICT companies, to empower every child around the world with DQ digital citizenship. The goal of this movement is to ensure that 1 billion children are connected online by 2030 and receive a high-

quality education based on DQ citizenship which improves wellbeing and security as well as provides economic enhancement. The movement helps nations bring tested and proven high-quality educational resources to their public and private primary education systems using a simple 'plug & play' DQ World online education program. This approach helps to overcome the usual bottlenecks for nations to start digital citizenship education programs, which include 1) lack of a comprehensive curriculum for digital citizenship, 2) limited topic expertise among teachers, and 3) challenges to implement effective assessment and feedback mechanisms.

In order to overcome these issues, the #DQEveryChild movement provides a research-based online education platform, DQ World, which enables 8-12 year old students to self-learn a comprehensive set of eight DQ digital citizenship competencies while receiving real-time DQ assessment with minimal needed support from teachers and parents. Teachers can serve as facilitators of discussions while utilizing online tools. The DQ World program has been tested and proven through academic research – showing a 14% improvement in DQ scores among children who participated in the program which translates into an ~30% reduction in cyber-risks and enhancement of future-ready skills and values such as global citizenship, empathy, and self-efficacy.

How #DQEveryChild enhances national digital education programs

- Provides an intensive and comprehensive digital citizenship education targeting 8-12 year old children.
- Provides well-researched and easy-to-use tools and resources for teachers and children.
- Provides a fun and engaging self-learning experience for children – teachers do not need to closely supervise the program.
- Provides individual and school-based feedback and assessment.

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DQ World Online Education

DQ World is an innovative research-based, e-learning platform that is specifically designed for young users of digital media and technology. The online educational platform has been recognized by two UNESCO awards for its pioneering efforts to promote digital citizenship education among children.

DQ World's approach is pioneering in the sense that it has transformed how nations approach digital education. Indeed, more and more school programs are incorporating technology in a variety of ways: some use computers in the classroom, some make online assistance available to children, and some teach coding and even robotics. Basic digital citizenship skills, however, are often overlooked by educators and parents despite being fundamental to a person's ability to get the most out of technology and to avoid risks. One reason for this gap is that teachers themselves have not been trained in the area of digital citizenship education, and they are already over-burdened with other teaching needs and requirements. Therefore, any comprehensive program needs to either (1) include training for teachers and fit in within the curriculum, or (2) provide training directly to students with only basic support needed from teachers. DQ World is based on this second approach, and is a compatible with a wide variety of learning environments.

To enable high-quality digital citizenship education within public and private education systems, DQ World provides a unique plug & play one-stop solution that enables 8-12 year-old children to self-learn a comprehensive set of 8 DQ digital citizenship competencies and receive real-time feedback and assessment. It requires minimal support from teachers and parents while empowering children to participate in fun learning activities across a series of interactive lessons.

Moreover, the techno-pedagogical design – school/teachers' guidebooks, implementation guidelines, flipped learning process and other teaching resources have been created to allow teachers to use the program proactively, incorporating DQ World in their classroom as an integral part of lessons & assessment. The DQ World assessment enables schools to understand their children's digital competencies and exposures to cyber risks.

The four key characteristics of the program are as follows.

- Curriculum: Building Social-Emotional Competencies to Manage Cyber Issues
- Pedagogy: Gamified "Learn and Play" Storytelling Pedagogy
- Assessment : Real-Time DQ Profile Assessment and Reporting System
- Learning Model: Flipped Learning Approach

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Curriculum:
Building Social-Emotional Competencies to Manage Cyber Issues

DQ World offers a comprehensive digital citizenship curriculum that specifically targets 8-12 year old children who are starting to engage actively with the digital world.

Most national digital education programs are campaign-based, restricting their focus to narrow topic areas like cyber-bullying prevention, account security or scam awareness. However, it is important to ensure that children's digital citizenship education is comprehensive covering all the 8 digital skills necessary to not only be informed and discerning users of technology today but also of the technology that will emerge tomorrow. Likewise, for digital citizenship education to be effective and adaptable, it needs to be rooted in concepts of identity, core values and social-emotional skills.
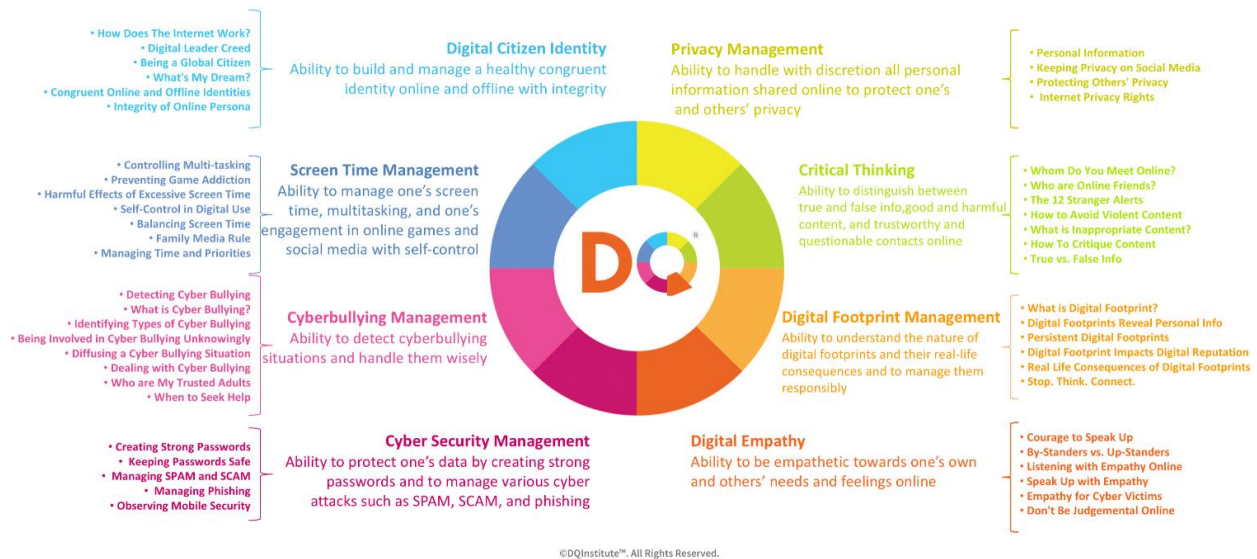
Figure 3: DQ Digital Citizenship Curriculum

The DQ World curriculum is designed for children to gain knowledge, skills, and attitudes/values related to the 8 DQ Citizenship competencies. Through the DQ World curriculum, children will develop more mature (1) technical abilities, such as the ability to use media effectively and securely, (2) social emotional abilities, such as self-awareness, self-management, responsible decision-making, and social awareness, (3) critical reasoning abilities – the ability to discriminate good information from bad, and (4) responsible and healthy cyber attitudes & behaviors to mitigate cyber

risks such as online grooming, addiction, cyber bullying, cyber victimization, online sexual behavior, and exposure to violent content.
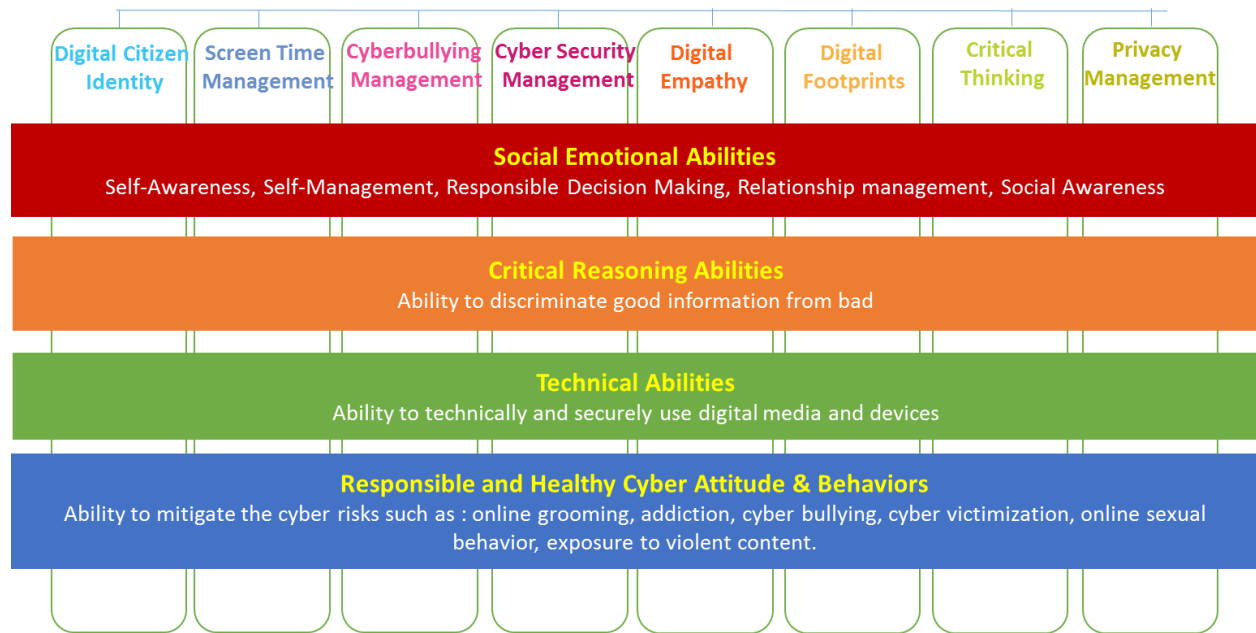

Figure 4: DQ Digital Citizenship Competencies and Related Abilities

Table 2 shows how the curriculum links to the 5 domains of Social-Emotional Learning (SEL) – self-awareness, self-management, relationship management, social awareness, and responsible decision-making and values.

Table 2: Liking of DQ Digital Citizenship Competencies to Social-Emotional Competencies and Cyber Risks

DQ Digital Citizenship Competency	Social-Emotional Competency (Singapore MOE)	Cyber Risks
Digital Citizen Identity	• Self-Awareness (Self-efficacy) • Self-Awareness (Accurate self-perception)	
Screen Time Management	• Self-Management (Self-motivation and discipline) • Responsible Decision-Making (Personal, moral and ethical responsibility)	Game addiction

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Cyber bullying Management	• Self-Management (Impulse control and stress management) / Emotional Regulation • Relationship Management (Negotiation, refusal and conflict management) • Relationship Management (Seeking and providing help) • Responsible Decision-Making (Personal, moral and ethical responsibility)	Cyber bullying Cyber victimization
Cyber Security Management	• Responsible Decision-Making (Problem solving)	Cyber threats
Digital Empathy	• Social Awareness (Perspective taking, Empathy) • Relationship Management. (Communication, social engagement and building relationships)	Online trolls
Digital Footprint Management	• Responsible Decision-Making (Problem identification and situation analysis) • Responsible Decision-Making (Evaluation and reflection)	Social media reputation risks
Critical Thinking	• Relationship Management (Seeking and providing help) • Responsible Decision-Making (Personal, moral and ethical responsibility)	Fake News Online grooming / radicalization Online sexual behaviors Online violent contents
Privacy Management	• Responsible Decision-Making (Personal, moral and ethical responsibility)	Privacy invasion

Pedagogy:
Gamified "Learn and Play" Storytelling to Promote Social-Emotional Learning

Through a gamified platform to encourage self-directed and experiential learning, DQ World focuses on fostering positive digital citizenship competencies without needing teacher or parental guidance. This is achieved through the creation of a varied multimedia experience: the DQ learning program combines animated video storytelling and interactive learning quests that provide both educational and entertaining experiences. Progress through the program rewards each child with skill badges, character cards, and certificates of accomplishment after each phase of learning.

Figure 5: Gamified Interactive User-Interface of DQ World

Based on rigorous evaluation that was reported in a peer-reviewed scientific study (Liau et al., 2015), it was determined that

- 92% of children found the gamification and multimedia approach of DQ World to be helpful for learning how to use the Internet safely, and
- 90% of children said the program made learning more interesting and fun.

Major elements of the DQ World program are based on gamification principles to promote the learning of positive values.

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First of all, as an interactive web-based platform, the DQ World program promotes exploration and discovery which can captivate and sustain the learner's attention as it makes learning interesting. Technology has been credited in helping to promote greater engagement in the subject and enhance learning (Yilmaz & Keser, 2016). Furthermore, the interface of the program includes game mechanics such as a leader board, progress bars, virtual currency, point systems, and avatars. Taking on an online persona, a user is confronted with various challenges (like encountering a cyberbully online), and has to choose to take actions to respond appropriately. These elements can help to reflect performance and the status of player's progress in the program. Such feedback can keep users motivated to continue with the program (Dicheva, Dichev, Agre, & Angelova, 2015). These elements have the additional benefit of helping to guide the transfer of skills beyond the program itself, because students are learning DQ skills in a digital environment that shares features with other digital environments they use.

Second, the DQ World program aims to structure its content as clearly and as concretely as possible. It presents the curriculum in multiple 5-10 minute missions, each with different learning points. In this way, the material is broken down as achievable learning stages and scaffolds the learning process for the user. Certain key messages might be featured in more than one mission in order to reinforce its importance as well as demonstrate its use in different contexts. In this way, the program provides the learner with different experiences and areas where the learning can be applied. This helps to provide multiple approaches in which there is no one-size-fits-all format and is helpful as it acknowledges that different kids learn the same materials in different ways (Keengwe, Onchwari, & Wachira, 2008). Each mission is accompanied by actionable learning tasks, such as sticker creation, a quiz, or a game. These elements facilitate the use of reflection and support learning with the use of immediate feedback.

Third, the DQ World program strives to allow meaningful learning through activities that are authentic and provides opportunities for users to develop their own personal narratives and takeaways. Videos and comics depicting common and relatable dilemmas or scenarios are used as teaching methods that users can immediately identify with. Users get to put themselves in the shoes of another character and are asked about feelings and thoughts related to a character's actions. Such elements help to facilitate knowledge transfer to real world problems (Koh, 2013). When children are given the chance to develop personal meaning from their learning, the program can be effective (Merrill, 2002).

Although the discussion above describes how the interface, content and experiential elements of the program contribute to learning, some researchers have questioned and tested whether something

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that is tied more emotionally rather than cognitively (such as values and morals) can be taught effectively with a computer program. Roodt & Wanjogu (2015). Roodt & Wanjogu (2015) states that values such as empathy are not something one simply possesses but are, in fact, possessed to varying degrees that can be enhanced. By breaking down values into several learnable component skills, they have documented positive results in using technology to enhance the experiential learning element to increase empathy learning in medical children (Roodt & Wanjogu, 2015). Similarly, the DQ World program utilizes several experiential elements to affect a user's empathy and self-esteem. Specifically, our pilot study examined the program's effects on children's ability to know what other people are feeling as well as on their self-perception.

Other studies hoping to influence one's values through technology have also demonstrated positive results. For instance, playing pro-social video games have been found to increase pro-social behavior through enhancing interpersonal empathy in children and adolescents in several countries (Prot et al., 2014; Greitemeyer, Osswald, & Brauer, 2010). Text messages to remind young adults to be empathic helped increase empathic feelings and motivations (Konrath et al., 2015). Acts of practicing compassion over a week period can help to improve self-esteem and happiness (Mongrain, Chin, & Shapira, 2010).

DQ World adopts a transmedia storytelling strategy, technique of using multiple platforms and formats of digital technology to convey a story experience. Jenkins (2003) has argued that transmedia storytelling across platforms can make characters more compelling. Given how children and teenagers are highly motivated to engage in digital technologies, it has been argued that a transmedia approach has the potential as a valuable educational tool for creating an "immersive, responsive, learner-centred learning environment rich with information and linked to children's existing knowledge and experiences" (Herr-Stephenson et al., 2013, p.2). In other words, a transmedia approach is consistent with constructivist approaches to learning advocated by psychologists such as Bruner (1990) that emphasize the active role of the learner in creating knowledge and making connections to pre-existing knowledge. Coupled with the earlier feature of classroom discussions, the transmedia approach is also aligned with Vygotsky's socio-constructivist theory (1978) that highlights the importance of learning from others who are more knowledgeable such as mentors.

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DQ World Values-Focused Techno-Pedagogical Design

In order to address the needs of 21ˢᵗ century learning to teach social-emotional competencies to children, the DQ World program adopts the following socio-constructivist learning activities in its techno-pedagogical design. We break down complex concepts and skills learning into easy steps to motivate the children and incentivize learning, as follows:

- *Step 1. Role-play through story reading: Children can better relate to situations that are presented in an animated story. Scenarios in the DQ comic book series launch a child into role-playing, thus stimulating both imagination and learning.*

- *Step 2. Evaluate through DQ survey questions: Children become more aware of specific issues raised when they are posed behavioral and attitudinal questions related to the situations encountered. This self-check guides the children to be mindful of various issues that could arise in the digital world, even when these issues may not be immediately apparent.*

- *Step 3. Learn through interactive videos and slides: Animated videos and a series of interactive slides are used as the captivating medium to: (a) impart knowledge of specific issues of the digital world; (b) develop self-awareness; (c) impart desirable core values; and (d) teach appropriate coping skills for difficult and challenging situations.*

- *Step 4. Reflect through quizzes: When children take quizzes, the assessment process requires some reflection that steers them to review key learning points.*

- *Step 5. Learn through active participation: Children are encouraged to take part in both online and offline activities, to put their learning into practice. They also receive guidance to form clear views and arrive at responsible decisions.*

- *Step 6. Collective reflection through classroom discussion: Learning becomes consolidated only if reflected upon. Teachers will monitor children's progress and provide guidance if children have any queries. Teachers act as facilitators of learning and employ three teacher-led classes or small group sessions for children to consolidate learning and check for children's understanding on the completed zones. Teachers can do one-to-one or small group guidance to address any gaps in learning during these sessions.*

Assessment:
Real-Time DQ Profile Assessment and Reporting System

A robust digital citizenship education must include opportunities for assessment and feedback. The assessment tools need to be comprehensive as well as adaptive to evaluate not only hard but also soft skills. Ultimately, the assessment should serve as a means of providing formative feedback that gives children a better understanding of their own strengths and weaknesses, so that they may find their own individual paths to success.

As the children engage in various "missions" on the platform, they complete surveys and quizzes that reinforce interactive activities. Each child's responses are tracked in order to measure progress, assess risk, and generate the child's DQ Profile. For example, when a child embarks on the program, he/she takes a preliminary online test within the DQ World program. After this pre-assessment, a child can get started on the DQ learning program. Upon completion of this online program, the DQ Profile is automatically generated to show how the child has performed. These two sets of profile results can be compared to assess the child competencies in digital intelligence and safety aspects before and after going through the DQ learning program.
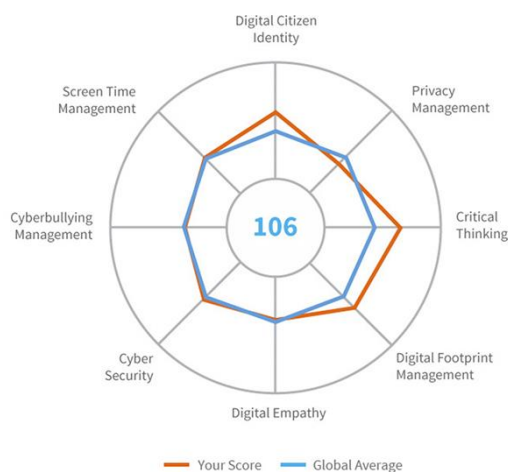
DQ Profile

The DQ Profile scores provide a comprehensive summary of both the strengths and weaknesses of children's DQ digital citizenship compared to a global standard. They measure the 8 attributes of DQ digital citizenship competencies: digital citizen identity, screen time management, digital empathy, digital footprint management, cyber-bullying management, critical thinking, privacy management and cyber security management. Each score is standardized with a global average of 100 and a standard deviation of 15.

FIGURE 6: DQ PROFILE SCORES

The composite DQ score is the average value of the 8 DQ profile scores, which can be interpreted as a child's digital readiness.

A child's online responses are coded and calculated using research-based indices which are related to his/her digital knowledge, skills, attitudes and behaviors. Specifically, the profile scores are derived from the analysis of related ability indices, as presented in Table 1. The self-reporting survey questions related to attitude/behaviors/values that are summarized in Table 1 and Figure 2 are asked along with various interactive activities and quizzes that test knowledge and skills.

Exposure to Cyber Risks

It measures how much children are exposed to 6 digital risks that may have harmful effects on them. This includes 6 measures: online strangers, online sexual behaviors, exposure to violent content, cyber bullying, cyber victimization, and game addiction level.

Table 3: Description of Cyber Risks

Category of Digital Risks	Measurement Description
Online Strangers	Level of a child's exposure to contact and/or meetings with online strangers.
Game Addiction	Child's likelihood of pathological use of video games.
Cyber Bullying	Occurrence and frequency of a student's involvement as the aggressor in cyber bullying.
Cyber Victimization	Frequency of a child's exposure to and/or experience of cyber victimization.
Online Sexual Behaviours	Exposure to online sexual content and proactive behaviors such as searching/visiting/downloading sexual content, receiving/sending sexual content with others or having sexual conversation with online strangers.
Exposure to Violent Content	Level of children's exposure to violent content (i.e., playing violent games or watching violent videos).

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DQ Reports

The DQ Report provides a comprehensive summary of a child's digital life including digital competency, usage, exposure to cyber dangers, personal strengths, and digital support environment as compared to other children within the nation. In addition, they provide some practical recommendations to improve a child's DQ score based on their current profile. They address the following questions:

- What are a child's DQ strengths and weaknesses, and how can teachers and parents encourage improvement?
- How balanced is a child's use of digital media and technology, and what proactive steps can teachers and parents take?
- Is a child at elevated exposure to cyber risks, and how can teachers and parents proactively protect and intervene?

- Table 4: DQ Reports - Areas of Assessment

Area	Category
DQ Score	This category assesses children's mastery of the 8 key areas of Digital Citizenship that are taught in the internationally-recognized DQ World online education curriculum. It also tracks children's DQ improvement, which is the difference in a child's average DQ score before and after completion of the DQ World online education program.
Personal Strengths	This category assesses children's personal strengths across the areas of global citizenship, social relationships, self-efficacy, self-regulation, emotional regulation, and balance of offline and online realities.
Balanced Use of Technology and Media	This category shows appropriately, and in what ways, children use digital devices and media, and provides useful information regarding their weekly screen time for entertainment use, device accessibility, digital media activity, and social media usage.
Exposure to Cyber Risks	This category indicates children's exposure to cyber risks, including online strangers, game addiction, cyber bullying, cyber victimization, online sexual behavior, and exposure to violent content.
Guidance and Support	This category reflects the degree of guidance children feel they receive with regards to proactive parental mediation and school computer and cyber safety education.

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There are 2 types of DQ Reports: (a) DQ Individual Report, designed for parents; and (b) DQ School Report, designed for schools. For teachers using the school-based platform, the system aggregates results into a DQ School Report which is the collective DQ profile score of all participating children in the school with class-specific information. The school's achievement is evaluated against the performance of other schools around the nation.

The DQ Report should serve as a starting point for conversation with children about their digital lives. Parents, teachers, and communities all share responsibility in shaping children's digital habits and skills, and with these results, such conversations can be more honest and constructive. It is important to be positive and supportive in order to gain valuable insights into our children's experiences that may otherwise never be shared. This way, we can offer concrete support for improving youth digital citizenship.

Figure 7: Sample DQ School Report – Performance Snapshot

Learning Model:
Flipped Learning Approach

DQ World takes a flipped learning approach that is child-directed, integrating e-learning conducted by children at home with in-class time that is devoted to discussion. This learning model adopts a child-centric approach, where the child takes ownership of his learning. In this model, the teacher also takes the role of a facilitator in guiding children towards learning success and parents takes the role of a supporter of the learning.

A multi-systematic approach involving schools, teachers and parents has been used successfully in various interventions for at-risk youth, aggressive youth and delinquents (Henggeler, Clingempeel, Brondino & Pickrel, 2002), and for changing behaviors to decrease the risk of youth obesity (Eisenmann et al., 2008; Gentile et al., 2009). DQ World accomplishes a multi-systematic approach in the following ways. First, the user-friendly and interactive DQ World game enables children to explore the 8 zones independently as self-directed learners. Children will be expected to acquire and demonstrate specific values, knowledge and skills as they progress through the 8 zones. They play the gamified e-learning program either at school or at home, and parents are informed via e-mails about a child's progress. Therefore, the program can help strengthen bonds between parents and a child. Second, children reflect upon their learning through the classroom discussion led by teachers. The teacher's main role is to monitor the progress of the students and facilitate the co-construction of the desired values, knowledge and skills through class-based discussions. Fig. 2 shows the 3 phases of the flipped learning model. Hence, this program is consistent with the current recommendation that the involvement of teachers, parents, and peers are essential for the success of digital citizenship intervention programs (Anastasiades & Vitalaki, 2011).
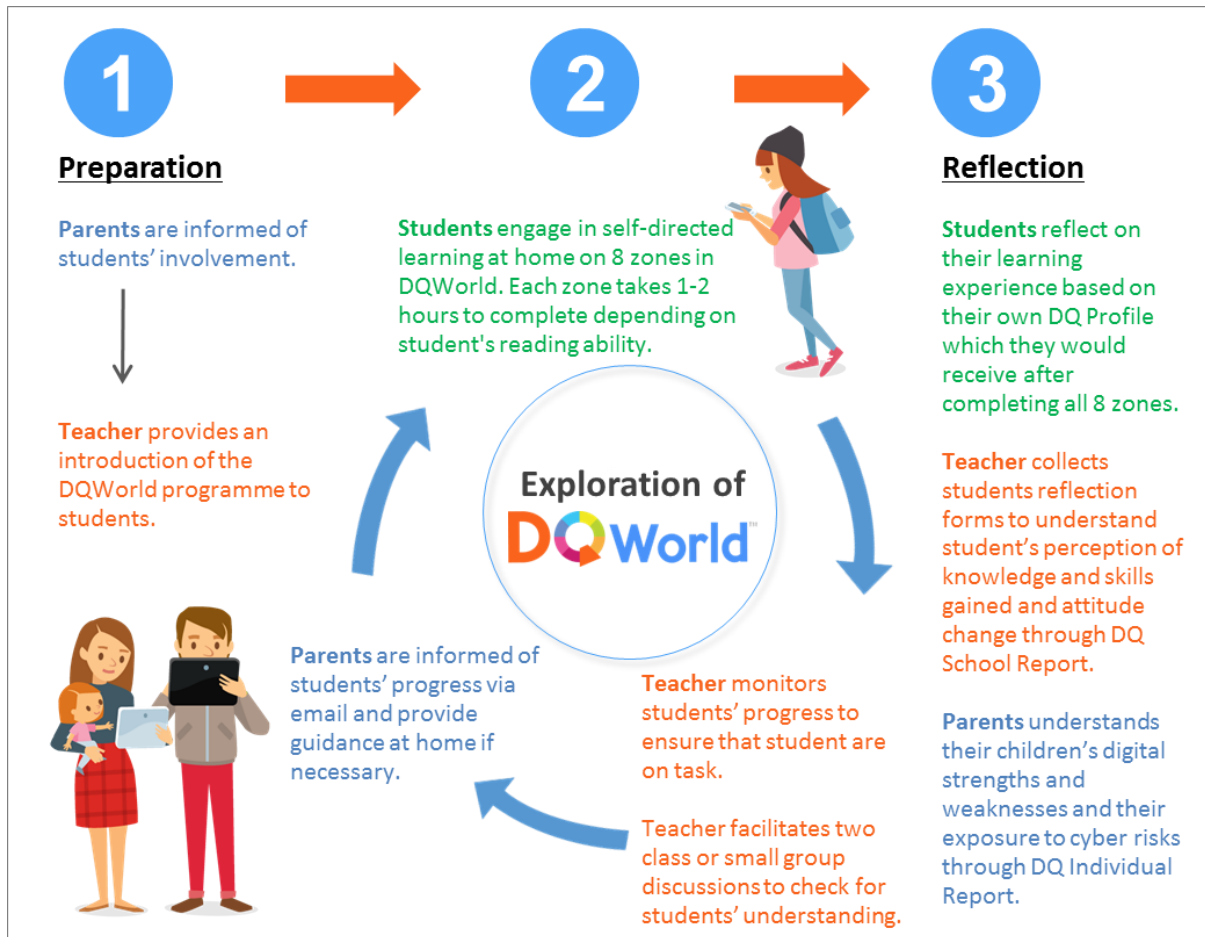
Figure 8: Three Stages of DQ World Flipped Learning Model

DQ World Online Activities for Children

Every child is issued a unique identification code and password to log in to the online survey at each stage of data collection. Children engage with the content and activities in the DQ World program through navigating ~80 Learning Missions in 8 Zones. Children are estimated to require 1-2 hours to complete each zone.

Upon completion, children are guided to reflect on their experience in exploring DQ World and complete a reflection form based on his/her learning experiences. They are also asked to retain the feedback they receive through the child's individual DQ profile scores after completion of the DQ World program.

Parents also receive their child's individual reports after completion, so that they can support the child's development and reinforce good parental mediation practices at home.

Roles of Teachers

Teachers take the role as a facilitator of online learning. The teacher's roles include:

- To monitor children's progress to ensure that each child is on task (e.g., children complete teacher-assigned zones within the stipulated time frame).
- To provide guidance to children who approach them with questions regarding DQ World when attempting to complete tasks within the stipulated time frame (e.g., assist children with reading difficulties).
- To consolidate learning after completion of the DQ World program by getting children to complete a reflection form based on a child's individual (basic) report they will receive once they complete the 8 zones.
- To collect children's reflection sheets and use information collected during class discussions, teacher-child one-to-one interaction times and parent-teacher meetings to affirm and provide support to children.

Teachers can better understand their DQ class profile through students' reflection sheets and class discussions. This would enable them to provide the necessary guidance and support to students so that they can manage their digital lives more effectively. Teachers may also use the information to facilitate conversations during teacher-student and parent-teacher meetings.

Schools receive a DQ school report that provides aggregated results which is the collective DQ profile score of all participating students in the school. Schools can use the results to identify the strengths and weaknesses in students' digital competencies and design a more targeted implementation plan for digital citizenship education.

Singapore Case Study:

In the 2016 Singapore DQ Pilot Study, it was observed that the program had better engagement and outcomes among children who benefited from more active participation of their teachers and parents. Although schools might actively incorporate DQ World into their curriculum in a variety of ways, some preferred to have their children carry out missions on school computers during a designated period with teacher supervision and supplementary follow-up self-learning activities with some supervision of parents. This method tended to result in improved completion rates and enhancement of DQ scores. Other schools took a hands-off approach, allowing children to conduct home-based learning on a purely voluntary basis without any teacher check-in. This approach tends to result in lower completion rates and DQ improvement. Overall, the schools with high teacher engagement – through active facilitation and performance tracking – achieved the largest improvements in DQ scores.

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DQ Institute is an international think-tank committed to improving digital education, culture, and innovation through cross-sector collaborations, global dialogue, and big data research. Its mission is to empower all individuals, families, organizations and countries to harness digital media and technology, and maximize positive outcomes, while preventing and mitigating risks. It is a not-for-profit charitable organization with locations in the United States, Singapore, and Korea.

DQ Coalition is a public-private-civic-academic coalition that aims to bring quality digital intelligence education to every child worldwide. It aspires to build a healthy and robust digital culture that harnesses and maximizes positive outcomes of digital media and technology. The DQ Coalition provides evidence-backed solutions and data-driven policy recommendations to nations to ensure that every child gets a quality digital citizenship education in a safe and secure digital ecosystem.

#DQEveryChild is a flagship global movement of DQ Coalition that seeks to empower every child with digital intelligence. Our children need DQ beyond IQ and EQ to succeed and thrive. It aims to set the global standard of digital citizenship and online protection for all children worldwide.