ISTE SEAL OF ALIGNMENT REVIEW FINDINGS REPORT

Computational Thinking & Computer Science Teaching Certificate Programme

FEBRUARY 2018

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ABOUT

ABOUT ISTE

The International Society for Technology in Education (ISTE) is the premier nonprofit membership organization serving educators and education leaders. ISTE is committed to empowering connected learners in a connected world and serves more than 100,000 education stakeholders throughout the world.

As the creator and steward of the definitive education technology standards, our mission is to empower learners to nourish in a connected world by cultivating a passionate professional learning community, linking educators and partners, leveraging knowledge and expertise, advocating for strategic policies, and continually improving learning and teaching

ISTE SEAL OF ALIGNMENT

Resources and products designed with the ISTE Standards in mind are choosing to demonstrate their commitment to support critical digital age learning skills and knowledge. Regardless of a solution's intended grade level, purpose or content area, by addressing the ISTE Standards and earning a Seal of Alignment, a solution is shown to consciously, purposefully and meaningfully support best practices for digital age teaching and learning.

ISTE considers a solution aligned to the ISTE Standards only after an extensive review conducted by trained ISTE Seal of Alignment reviewers, and it has been determined to meet all critical elements of a particular standard indicator in accordance with specific review criteria.

By earning a Seal of Alignment, ISTE verifies that this product:

- Promotes critical technology skills
- Supports the use of technology in appropriate ways
- Contributes to the pedagogically robust use of technology for teaching and learning
- Aligns to the ISTE Standards in specific ways as described in the review finding report

RESOURCE DESCRIPTION

WHAT IS THE COMPUTATIONAL THINKING & COMPUTER SCIENCE TEACHING CERTIFICATION PROGRAMME?

Computational Thinking and Computer Science Teaching Certification Programme is a professional development program produced by the Malaysia Digital Economy Corporation (MDEC). It is designed to build teacher competency in Computational Thinking (CT) through coding, with an emphasis on integrating the principles of CT throughout the school curriculum.

The program has two main components: a 5-day face-to-face course and a certification component offered in conjunction with Computing at School (a professional community in the UK) and sanctioned by British Computing Society. Certification is offered to teachers who, after completing the 5-day course, develop and submit a working computer program and conduct a classroom investigation to evaluate aspects of the pedagogy presented in the course.

WHAT IS COVERED IN THE COMPUTATIONAL THINKING & COMPUTER SCIENCE TEACHING CERTIFICATION PROGRAMME?

The majority of the 5-day course is focused on CT methodology as applied within a computer-programming context, using the programming language *Scratch,* or offline activities developed by Unplugged (csunplugged.org). Despite the emphasis on programming, there is significant attention paid throughout the course to making connections between CT principles and their application in life and in content area studies. The fourth day of the course is focused entirely on pedagogical principles and practices that, within an inquiry-based framework, could capitalize on CT to support regular classroom instruction.

Each day ends with a reflection on what was learned that day, as well as homework that might include development of a lesson plan, further readings, or participation in an online discussion.

The computer program that must be developed for certification is intended to demonstrate the author's technical prowess while also doing something useful in the author's daily work. The project must exemplify a broad range of programming techniques and also be intended to be applied in an authentic classroom situation.

HOW DOES THE COMPUTATIONAL THINKING & COMPUTER SCIENCE TEACHING CERTIFICATION PROGRAMME IMPACT CLASSROOM TEACHING?

Teachers who complete the MDEC training take a significant, positive step toward being prepared to empower students to leverage technology to become more independent, successful learners. The classroom investigation requires that participants test particular pedagogical dimensions taught during the workshop by implementing them in their classrooms and evaluating how successful they were.

ISTE SEAL OF ALIGNMENT REVIEW

Product:
Computational Thinking and Computer Science Teaching (CT & CS) Certification Programme
Company: Malaysia Digital Economy Corporation (MDEC)
Date of Award: February 2018

REVIEW METHODOLOGY

ISTE Seal of Alignment reviews are conducted by a panel of education and instructional experts. Reviewers use data collected both separately and collectively to determine how a solution addresses specific elements described in each of the indicators of the ISTE Standards. Special instruments are used by reviewers to collect data on potential alignment across all resource materials. Alignment is determined based on the extent to which all or some of specific elements are addressed within the materials. Reviewers conduct regular calibrations to assure the validity and reliability of the results and final review findings are combined for an overall score for alignment on each individual indicator.

The CT & CS Certification Programme was reviewed for alignment against the ISTE Standards for Educators, at the Readiness level. Readiness reviews look for evidence of experiences that build a foundation for successfully acquiring knowledge and skills of the ISTE Standards for Educators.

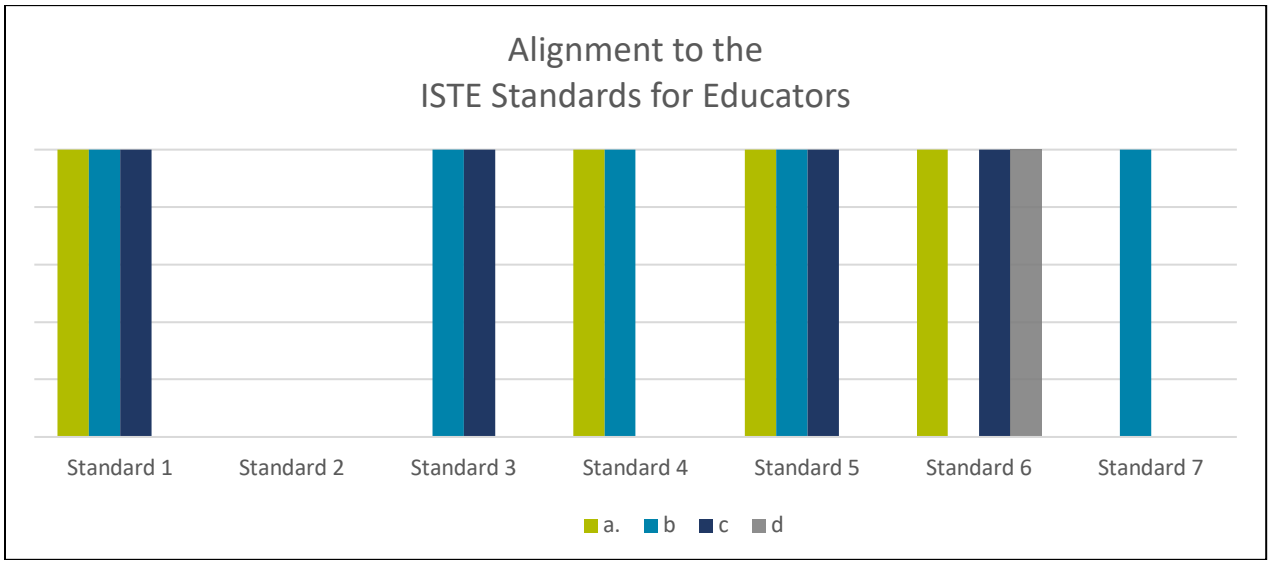
SCOPE OF REVIEW

During the review process, reviewers:

- collected data on when and how each activity addressed specific skills and knowledge described in the ISTE Standards for Educators.
- compiled findings to determine overall alignment across all ISTE Educator standards and indicators.
- used aggregate findings to form the basis of the overall alignment results.

REVIEW FINDINGS

The CT & CS Certification Programme supports the following indicators of the ISTE Standards for Educators:



The CT& CS Certification Programme supports the ISTE Standards for Educators in the following ways:

ISTE Standard	Finding Statement
1. Learner	
1.a. Set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness.	Participants set personal goals for the workshop and develop, implement, and reflect on classroom exploration of pedagogy taught in the workshop.
1.b. Pursue professional interests by creating and actively participating in local and global learning networks.	Foundational elements of professional learning networks (PLNs) are established through face-to-face brainstorming sessions and online forum posts.
1.c. Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.	The workshop introduces participants to 21st century learning, along with appropriate pedagogical strategies, and requires reading and reflecting on related publications.
2. Leader	

2.a. Shape, advance and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders.	
2.b. Advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students.	
2.c. Model for colleagues the identification, exploration, evaluation, curation and adoption of new digital resources and tools for learning.	
3. Citizen	
3.a. Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community.	
3.b. Establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media fluency.	Workshop instruction includes recommendations for how to build a "Culture of Inquiry" through inquiry-based instruction that models CT as a vehicle for exploring and understanding the world. Online resources and media fluency are not targeted, but digital literacy is developed throughout.
3.c. Mentor students in safe, legal and ethical practices with digital tools and the protection of intellectual rights and property.	Workshop instruction directly addresses these topics and engages participants in discussing and sharing ideas for classroom implementation.
3.d. Model and promote management of personal data and digital identity and protect student data privacy.	
4. Collaborator	
4.a. Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.	Foundation is laid through teacher discussions of concepts taught in the workshop and development of plans for classroom implementation.
4.b. Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.	Foundation is laid throughout the course for helping participants see CT as a vehicle for collaborative exploration of real-world issues. CT provides ample opportunities to systematically troubleshoot technology issues.

4.c. Use collaborative tools to expand students' authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally.	
4.d. Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.	
5. Designer	
5.a. Use technology to create, adapt and personalize learning experiences that foster independent learning and accommodate learner differences and needs.	Participants are introduced to inquiry-based learning as a means for helping students become more creative, more positive and more independent, and for helping students with special needs receive the support required for success.
5.b. Design authentic learning activities that align with content area standards and use digital tools and resources to maximize active, deep learning.	Teachers are shown how CT can be used to support any content area and complete a final project for exploring what they learned in the workshop in their regular classrooms.
5.c. Explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.	Teachers are introduced to instructional design principles and practices that engage and support learning and brainstorm and develop implementation plans for their particular classrooms.
6. Facilitator	
6.a. Foster a culture where students take ownership of their learning goals and outcomes in both independent and group settings	Helping students become self-directed learners is a main focus of the course content and learning activities.
6.b. Manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces or in the field.	
6.c. Create learning opportunities that challenge students to use a design process and computational thinking to innovate and solve problems.	Using CT to support student problem solving challenges through an applied process is at the heart of this workshop.
6.d. Model and nurture creativity and creative expression to communicate ideas, knowledge or connections.	The workshop specifically targets development of a culture that supports creativity, and it models CT activities that

	promote creative solutions to challenges through algorithmic processes.
7. Analyst	
7.a. Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.	
7.b. Use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction.	The workshop introduces the development and uses of rubrics as a tool for guiding and assessing student work, and allowing for individual learning needs and preferences.
7.c. Use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction.	

CONCLUSION

Overall, there is widespread support for the Standards for Educators.

The skills and concepts taught, the discussions held, the pedagogy explored, and the exercises and project activities all combine to lay a foundation that could effectively prepare participants to take full advantage of subsequent training that directly and more robustly addresses the ISTE Standards.

This resource is particularly strong in portions of the course that address the need for more technically skilled citizens, the various components of Computational Thinking, and the instructional activities for learning the programming language *Scratch*. These are detailed, clearly written, and systematically presented. The sections on pedagogy are somewhat less developed, but still rich in useful information.

Given that Malaysia is rapidly expanding its technology infrastructure and developing technological skill among its citizens, this course represents a solid, legitimate step in the right direction. The Computational Thinking skills that this program introduces, and the pedagogical orientation and practices it seeks to develop among teacher participants combine to make it a potentially valuable, powerful vehicle for helping Malaysia achieve its technology-related goals.