International Society for Technology in Education

ISTE SEAL OF ALIGNMENT REVIEW FINDINGS REPORT

CodePKU

MAY 2019

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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 CODEPKU?

CodePKU Technology (Shenzhen) Co, Ltd. offers offline and online courses in Chinese for programming education, online education for teenagers, training of children's products, programming competitions for young people, and international exchange programs.

CodePKU offers courses in Scratch, Python, Arduino and National Olympiad in Informatics in Provinces (NOIP). Each course is organized into twelve sequential lessons that are facilitated by the teacher in a single class period.

These four courses include an online introduction to the coding platform and challenges which the students watch independently prior to meeting as a class. Face to face activities begin with guided instruction by a teacher followed by small group work to complete challenges. Activities conclude with peer review and feedback with time for program revisions and extensions built in. Final course assessments evaluate basic coding and design strategies. Teachers are also provided with reflection questions to assist in refining their practice.

The courses are recommended for specific age levels, from 6-17 years, and take students through a sequence of activities that build from the foundational level through to independent application.

In Scratch, students learn graphical programming and use instructions such as cycle and control to design games, animations, art, and music using Scratch 3.0. In Arduino, students combine Arduino, sensors and graphical programming to solve problems in real life. In Python, students learn calendar making and use turtles and LOGO for drawing. In NOIP, students learn C++ grammar knowledge, simple algorithms as well as the key knowledge points of NOIP. Educational institutions can use these courses as an effective record of students' progress in their coding skill development throughout their school experience.

HOW IS CODEPKU IMPLEMENTED?

Each course begins with the basics of the coding platform and through the twelve subsequent lessons scaffolds the learning challenges. Following a consistent learning framework, students are encouraged to engage in the design process when planning a coding strategy, executing their code, evaluating and revising. Implementation and teaching guidelines outline key areas of focus, critical questions to pose, and strategies for challenge students to code efficiently and accurately. Implementation guides provide teachers with a detailed plan to insure fidelity of delivery. The courses are designed to take a learner from the introduction of the coding platform and scaffolds the challenges to apply more advanced commands as lessons progress. The lessons connect through the combination and revision of previously introduced commands.

Each course follows a similar sequence, introducing learners to the basics of each coding platform through the use of a child-friendly video that introduces students to the key skills and syntax of the lesson and ultimately proposes the task for the lesson. This flipped-classroom approach is used to introduce topics throughout the platform.

ISTE SEAL OF ALIGNMENT REVIEW

Product: CodePKU
Organization: Shenzhenshi Bianwanbianxue Jiaoyu Keji Youxian Gongsi
Date of Award: May 2019

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.

During the review process for CodePKU, reviewers:

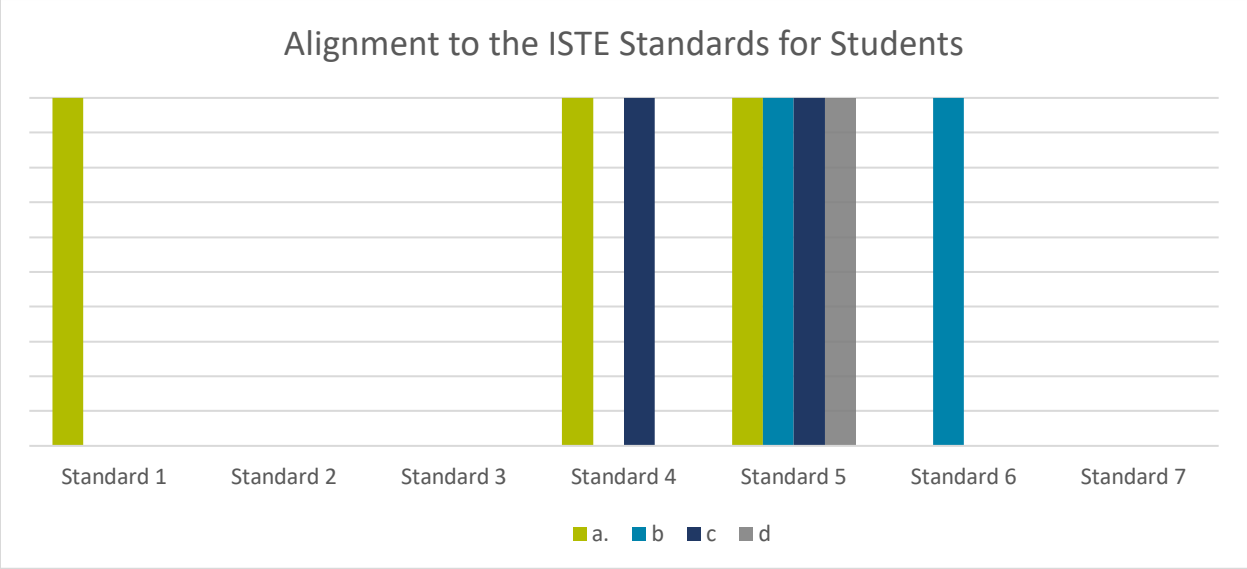
- collected data on when and how each activity addressed specific skills and knowledge described in the ISTE Standards for Educators at either a foundational or applied level
- compiled findings to determine overall alignment across all ISTE Student standards and indicators.
- used aggregate findings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

SCOPE OF REVIEW

CodePKU was reviewed for alignment against the ISTE Standards for Students. The Scratch, Python, Arduino, and National Olympiad in Informatics in Provinces (NOIP) course implementation guides were reviewed in full along with a selection of video transcripts. The materials were translated to English by CodePKU in order to complete this review.

REVIEW FINDINGS

CodePKU was found to address the following standards and indicators of the ISTE Standards for Students:



CodePKU addresses the ISTE Standards for Students in the following ways:

- Applied – Resources and activities aligned at the *applied* level primarily focus on practical, real-world, and/or relevant opportunities to practice the skills and knowledge learned in the curriculum

- Foundational - Resources and activities aligned at the *foundational* level primarily focus on skills and knowledge that facilitate skill acquisition to eventually meet ISTE Standard indicators.

ISTE Standard	Foundational Finding Statement	Applied Finding Statement
1. Empowered Learner		
1.a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning	Students reflect on learning process at the conclusion of each activity. The students do not set their own goals but	

process itself to improve learning outcomes.	reflect on reaching goals of the coding challenge.	
4. Innovative Designer		
4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.		Design process is used in each of the scaffolded activities. Students all work on the same challenge, compare coding strategies, and have a few opportunities to apply their own ideas. Lessons employ gradual release as students begin to apply coding terms in more challenging projects.
4.c. Develop, test and refine prototypes as part of a cyclical design process.		Programming challenges and final assessments guide students through refining code, changing design ideas, and modifying outcomes. Feedback from peers is included in lesson implementation
5. Computational Thinker		
5.a. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.		Lessons build on algorithmic thinking. The Arduino Design Challenges have students problem solving a series of scaffolding challenges using science concepts and coding to create prototypes.
5.b. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.	Python begins with using data to create visualizations. An understanding of coordinates is used to solve coding challenges in Scratch and Python.	
5.c. Break problems into component parts, extract key information, and develop		All courses follow the same strategy of having students analyze the problem and break it into

descriptive models to understand complex systems or facilitate problem-solving.		parts/steps. Key information is identified and flowchart models are created. This is done offline but follows a process that meets this indicator.
5.d. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.		Code solutions are tested and analyzed step-by-step and tested as new commands are introduced.
6. Creative Communicator		
6.b. Create original works or responsibly repurpose or remix digital resources into new creations.	Original works are created using the course platform (Scratch, Arduino). Scratch projects may be remixed or hacked for the Scratch Gallery.	

CONCLUSION

CodePKU is an instructor-led, comprehensive course catalog that teaches students the basics of coding languages and then builds on the basics through engaging challenges and tasks. The tasks and challenges facilitate an ever-increasing ladder of difficulty. The tasks connect and build on the coding requirements as students move through the lessons. The platform introduces commands in a strategic logical sequence that gives students an authentic coding experience at each level.

The focus on teaching coding strategies is identified in the learning outcomes and the course activities begin at the foundational level and move towards applied as students move through the lesson sequence in a consistent strategy that facilitates student acquisition of skills.