White Paper:
World Languages & Computer Coding Are Fundamentally Different

Background

Over the past few years, a dozen or more states have introduced legislation that would allow the subject of "computer coding" to count toward satisfying "foreign language" credits at the high school level. In a disturbing trend taking place around the country to recognize coding as a foreign language in the K-12 curriculum. Texas and Oklahoma have passed bills allowing this substitution, and legislators in Florida, Virginia, Maryland, Washington, Oklahoma, Kentucky, and Georgia and several others have proposed similar measures. Proponents of replacing human language courses (i.e. Spanish, Chinese, English) with computing language courses (i.e. Java, C++, HTML) point toward the growing workforce demand for computer science skills, and emphasize the need for our students and economy to remain competitive in the 21st century. However, advocates for students suggest that lawmakers should find a way to offer both subjects. In the words of the CEO of Code.org, *"the only people who would suggest that computer science is akin to learning a foreign language have never coded before."*

Languages are Vital to the US Economy

World languages are intrinsic to the national and global economy. As the United States continues to globalize its market and engage other countries in diplomacy and trade, language plays a crucial role at every step. The private sector recognizes this. A recent survey of U.S. businesses by JNCL-NCLIS and the Michigan State University Collegiate Employment Research Institute revealed that over half of U.S. businesses track their employees' foreign language skills, 35% give an advantage to multilingual applicants, and one in six has lost business prospects due to a lack of employees with language skills.

Based on a survey of 1,200 US employers, the research firm Ipsos found that 9 out of 10 businesses rely on employees with language skills other than English. And 56% say their foreign language demand will increase in the next five years. The future of the economy is clearly global, and our nation's success in it depends on the ability of our citizens to meaningfully partake in it.

Language-Learning has Lifelong Cognitive Benefits

Knowledge of a second language has been shown to confer a wide array of cognitive benefits on the individual at all life stages. In early childhood, acquisition of a second language has strong, positive behavioral and developmental effects, including greater cognitive flexibility and improved problem solving. In K-12 schools, language education, particularly the growing trend of dual language immersion, improves tests scores for native English speakers and English learners alike and narrows achievement gaps. For an adult, language proficiency has been associated with stronger executive function in the brain, greater likelihood of recovery from stroke, and delayed onset of Dementia-related ailments. Knowledge of a foreign language pays its dividends over a lifetime.

Conclusions

Besides putting foreign languages, an already underfunded discipline, at risk of losing the support of schools, districts, and states, the movement to recognize computer coding as a substitute or alternative to a foreign

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language has another damaging consequence—it allows two completely unrelated disciplines to satisfy the same credit. This is dangerous, as it 1) sets a precedent for the same to happen between other unrelated disciplines and in doing so, 2) opens debate over which subjects are more important than others. In addition, implementing this policy would pose a host of logistical problems in areas such as the allocation of funds to foreign language departments for curriculum and professional development and the acceptance of students' foreign language credits at out-of-state universities.

It is the position of the Joint National Committee for Languages and the National Council for Languages and International Studies (JNCL-NCLIS), its 130 organizational members and 300,000 professionals represented that computer coding should not be offered as a substitute or alternative to a world language course. The two are fundamentally different skill sets—employed under different circumstances, for different purposes, and with different effects on the individual.

Language education, in addition to the myriad cognitive benefits it provides, opens the world up to our students—a world with over 7,000 languages that is growing increasingly complicated and diverse. It is incumbent upon our educational system to ensure our students are equipped with the skills needed in the 21st century. Foreign languages are one such skill, equal in merit to the computer sciences. Room for computer coding courses can be made elsewhere in the curriculum. As suggested by the coding community itself and computer technology giants such as Microsoft, Google, Facebook, and Amazon, the most logical place would be among the sciences and mathematics.

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The Coding Community Agrees:
Coding is NOT like Learning a Language.

Hadi Partovi, CEO of Code.org, has stated:
> "Code.org formally opposes the idea of classifying computer science as a foreign language. First off, 'computer coding' isn't what we should teach students. 'Computer science' is what we should teach. Just like in English class we don't teach just handwriting and grammar, we teach English literature and composition. Learning 'coding' is just one part of computer science. Learning algorithm design, computational thinking, how the Internet works, data analysis, cybersecurity, these are equally important aspects of computer science, and none of it, not even the coding, has anything to do with learning a foreign language. **The only people who would suggest that computer science is akin to learning a foreign language have never coded before."**

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Delegate Mark Levine of the Virginia House of Delegates has said:
> **"While computer coding is a vital skill for modern times, it should never be at the expense of foreign languages.** I had the opportunity to study in Switzerland for a year on a Fulbright Scholarship at the Université de Neuchâtel and became fluent in French. I couldn't agree more with you about the critical thinking skills inherent in learning a foreign language and the necessity of doing so in our increasingly connected linguistically diverse global community. **We need computer skills *and* foreign-language skills.** Both are critical to our modern world."

Srini Mandyam, CTO and co-founder of instructional coding company Tynker said:
> "Coding is an incredibly important 21st century skill for our kids to learn, and that is why we spend so much time trying to teach it. But **I don't believe it is the same or even really comparable to learning a foreign language**. It would be a shame to lose something so important for the sake of adding something else, even something as important as coding. Clearly, education leaders must figure out a way to teach both."

Amy Hirotaka, Director of State Government Affairs, Code.org released this statement:
> "Code.org, Computing in the Core, Microsoft, Amazon, Google, Facebook, the College Board, and the Computer Science Teachers Association and numerous other organizations, support a policy allowing **computer science to count toward mathematics or science graduation requirements."**

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The Language Community's Perspective

The American Council on the Teaching of Foreign Languages (ACTFL), the national world language association, advocates for the study of both world languages and computer science. Both are essential skills in a world that is connected across borders and through technology, and both provide specific skills and a way of thinking; however, the perspectives and skills gained are not equivalent.

A computer coding course is not equivalent to a world language course for the following reasons (excerpts from www.actfl.org):

- The study of computer coding does not allow students to gain the intercultural skills, insight, and perspectives to know how, when, and why to express what to whom. In other words, **computer coding does not meet the standards** outlined in the World-Readiness Standards for Learning Languages (National Standards Collaborative Board, 2015).

- Computer coding cannot be used by people to interact and negotiate meaning with other people.

- Computer coding cannot be used to investigate, explain, and reflect on the relationship between the products, practices, and perspectives of a particular culture through the language. Languages provide an historical connection to society and culture and have been around for centuries, gathering the elements of culture, preserving stories, and being used for human communication.

- In comparison to most world languages with about 10,000 vocabulary words and grammatical structures, computer coding does not utilize large numbers of words, nor does it use them in the same ways. **A "typical computing language has a vocabulary of about 100 words, and the real work is learning how to put these words together."** (Hirotaka, 2014)

- Merriam-Webster provides the following "simple" definition of language: the system of words or signs that people use to express thoughts and feelings to each other. **Computer coding does not express thoughts or feelings.**

- Computer coding is part of the larger field of computer science, which is a critical 21st century subject and deserves its own graduation requirement. **Computer science is much more related to mathematics and science than to languages.**

- **Colleges and Universities do NOT count coding/computer science as a foreign language** upon admission. Substituting one with the other is both misleading to students and parents as well as confusing for college admissions counselors.

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