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# **Pytch** — **supporting learners over** the bridge from blocks to text



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## Introduction and approach

Block-based programming languages, and Scratch in particular, are widely used to introduce young learners to programming. As these students progress through their education, they want or need to transition to using text-based systems and encounter a number of challenges as they do so. The novel feature of Pytch in addressing this difficulty is that it focuses on the question of programming paradigm, allowing students to continue to write the style of program they have become familiar with, supporting Sprites, Sounds, and interactive event-driven programming using terms familiar to users from the Scratch environment.

Pytch supports teachers and students in making the transition from block-based to textbased programming.



elf.set size(0.05)

for x in range(15):

def play(self)

while True

@pytch.when\_I\_start\_as\_a\_clone

tch.create clone of(self

lf.go\_to\_xy(-100,-100) # Get out of the way of the rocke

self.switch\_costume( random.choice(self(Costumes)[:-4] )
self.set\_size(random.uniform(0.01,0.05))

lf.go\_to\_xy( random.randint(-240,240), random.randint(-180,180))

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**Pytch Development and evaluation process:** 



## **Pytch lesson plans**

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elf.go\_to\_front\_layer(

The team is working with stakeholders to co-create curriculum-aligned lesson plan for teachers and classrooms. The Pytch-based module pilot is now available for schools and feedback under collection and analysis. The module is included also in CSLINC (Computer Science Inclusive Learning Environment) to reach and support CS education widely.

The structure of our lessons follows a PRIMM (Predict; Run; Investigate; Modify and Make) approach for interactive and engaging Python lessons based on Pytch.

Materials provided for each lesson:

**Easily adapts to future** 

expansions.







#### **Future works**

Our results to date with Pytch indicate that we have a novel, powerful approach that can support learners effectively in a fun and supportive environment. Pytch has been successfully used with around 350 participants in classroom environments; feedback indicates that users enjoy working creatively and productively with the system.

We are currently working with stakeholders to improve our lesson plans and develop new features to support the classroom educator experience.



#### Feedback from students and teachers:

- » Definitely, a hit, seemed to work very well with lots of code questions coming up from the kids a good sign that they were engaging with it! [...] Also, it is super visual/interactive stuff that is being made and this is great too.
- » [Pytch] would be very cool for introducing writing classes to students regardless of whether they are transitioning from Scratch.
- >>> It succeeds in its mission to be a bridge from Scratch to Python.

#### Pytch is useful for learning to program in Python



Debugging

Lists

#### *N=110, post-participation surveys*

I would like to continue using Pytch when learning to program



» Scratch is for children, here [with Pytch] you can type in and feel smarter!

- » Great website for a transition from block to text coding. Easy-to-read code and debug.
- »» It's easier to learn by yourself [with Pytch tutorials].
- $\gg$  Very fun to use! :)
- » Really engaging; using Python can be intimidating.
- >>> I learned more in these few hours than I did in 2 years of coding in school. Pytch is great!
- » [...] I think the software is really helpful and good for bridging the gap between scratch and programming that I actually might recommend it to the coding club in my school.
- » Overall I have enjoyed this week's course and think I have learnt a huge amount especially since I had no experience with SCRATCH beforehand, this was genuinely a brilliant language to start with.





### Learn more and help us: info@pytch.org ttps://pytch.scss.tcd.ie/

@pytchlang

Pytch is free and open, try it out: https://pytch.org/

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