

A Gamification Platform for Inspiring Young Students to Take an Interest in Coding

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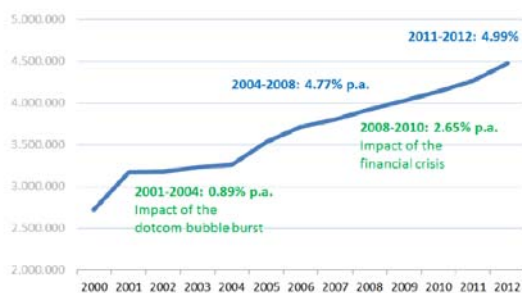
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Motivation



ICT Workforce Growth in Europe

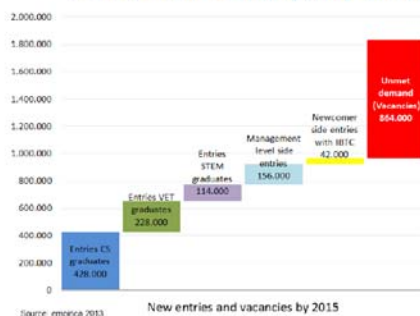


Source: Empirica, 2013, based on Eurostat IFS. Narrow definition: 2000-2010 ISCO-88 groups 213, 312: "Computing professionals" and "Computer associate professionals"; NB. break in series 2011: ISCO-08 groups 23 "ICT professionals", 35 "information and communications technicians".

Motivation



New Demand by 2015 and how it will (not) be met



Source: empirica 2013

CS: Computer Science; VET: Vocational Education and Training; STEM: Science, Technology, Engineering, Mathematics; IBTC: Industry based training and certificates

What are we doing about this?

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- Hour of code - csedweek.org (United States)



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- Hour of code - csedweek.org (United States)
- Europe code week - codeweek.eu (Europe)

The screenshot shows the Codeweek website interface. At the top, there's a navigation bar with 'Home', 'Events', 'Resources', 'Why coding?', 'About', and 'Help'. Below the navigation is a world map with red location pins. A prominent button reads 'LIST ALL EVENTS IN CROATIA'. Below the map is a grid of 24 national flags, each with its country name underneath: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Isle of Man, Italy, Latvia, Lithuania, Luxembourg, Malta, Moldova, Netherlands, and Norway.

Our Approach

“the use of game design elements in non-game contexts” [Deterding et al. 2011]

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The slide illustrates the approach to gamification in coding education. It features a central title 'Our Approach' and a quote from Deterding et al. (2011) defining gamification as the use of game design elements in non-game contexts. Below this, the main goal is stated: 'A Gamification Platform for Inspiring Young Students to Take an Interest in Coding'. Two images are included: on the left, a stylized Android robot character dressed as a pirate, and on the right, a screenshot of a gamified coding interface showing a grid, a character, and various UI elements.

Our implementation

- We organized Code Cyprus 2014
 - Goal: *“Inspire high school students to take an interest in computer science.”*
 - Sponsored by: *Cyprus Fulbright Commission* and *UCLan Cyprus*
 - The event took place on March 8th, 2014 at UCLan Cyprus (<http://2014.codecyprus.org>)

The program

- “Why learn coding?” presentation
- Building a Frogger mobile game with AppInventor
- Treasure Hunt Game oriented
- Motivation movie: “The Startup Kids”

Example: Variables in AppInventor

The screenshot displays the AppInventor interface with three main panels: Viewer, Components, and Properties.

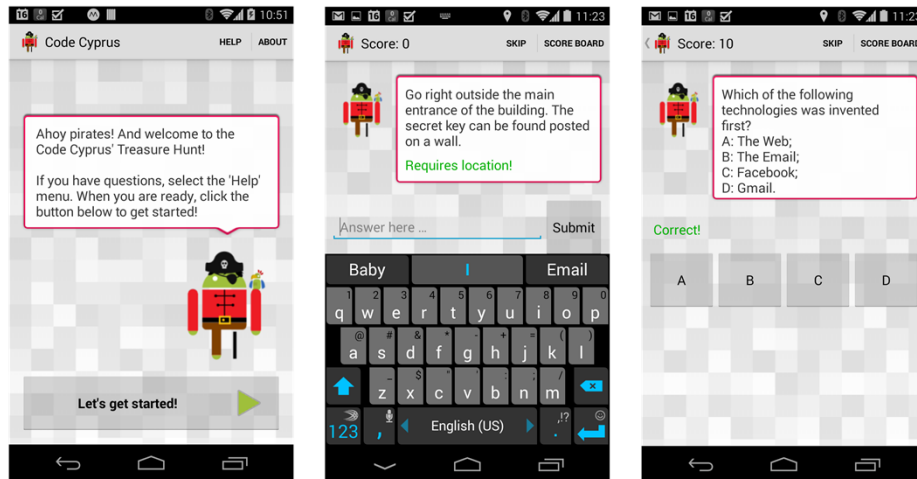
- Viewer:** Shows a mobile app screen titled "Screen1" with a road graphic. Two yellow trucks are positioned on the road. Below the road, there are vertical lines and numerical labels: 50, 100, 150, and 200.
- Components:** A tree view showing the hierarchy: Screen1 > road > yello_truck.
- Properties:** A list of properties for the "yello_truck" component:
 - Enabled:
 - Heading: 0
 - Interval: 100
 - Picture: truck_yellow_1.png...
 - Rotates:
 - Visible: (circled in red)
 - X: 200 (circled in red) with a blue arrow pointing to a value of 100.
 - Y: 174

A green event block is visible, containing the code: `set yello_truck . X to 100`.

The Treasure Hunt

- Main elements
 - Mobile App with supporting Server
 - A sequence of linked questions
 - Real-time scoreboard / leaderboard with locations
 - Intriguing prizes

The Mobile App



https://play.google.com/store/apps/details?id=org.codecyprus.android_client

The Server

Open source code available at: <https://github.com/nearchos/uclan-tch>

The questions



Treasure Hunt Challenge

Question Q.2014.03.11

You are almost there. The treasure awaits you!
 Σχεδόν τερματίσατε. Ο θησαυρός σας περιμένει!

But you will not get the answer so easily yet. You need to solve this riddle;
 Αλλά δεν θα βρείτε την απάντηση σε αυτό τόσο εύκολα. Πρέπει πρώτα να λύσετε το κούι;

What is the value of Z after we press the "ButtonFancy"?
 Ποιά θα είναι η τιμή του Z μετά που θα πατήσουμε το "ButtonFancy";

```

when ButtonFancy Click
do
  set global V to 1
  set global Z to 1
  #
  get global V
  then
    set global Z to 1 + get global V + get global Z
    
```

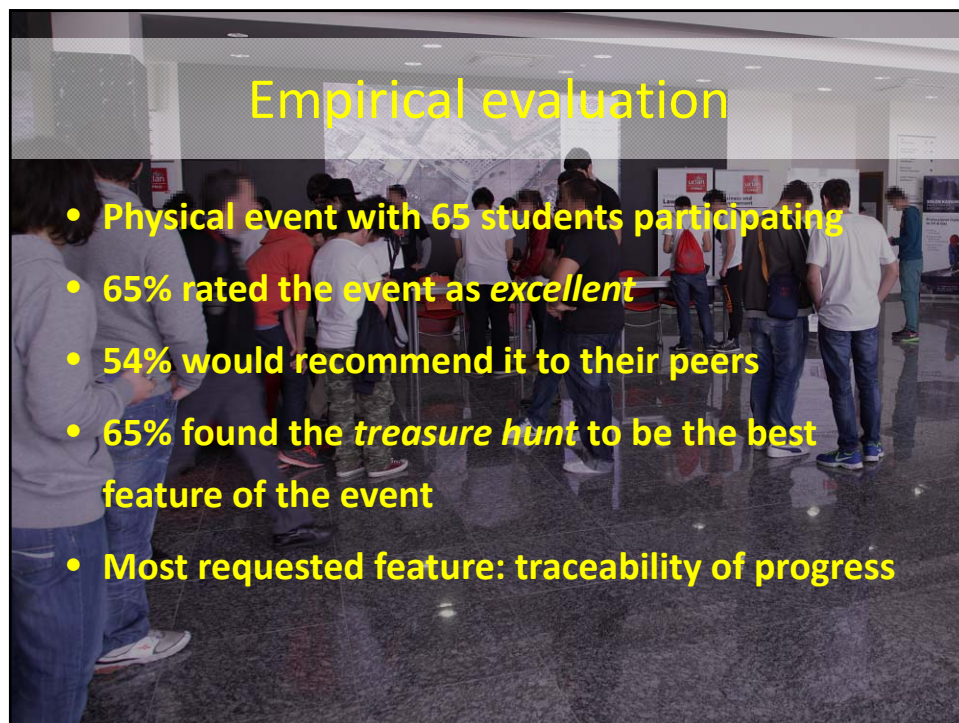
For more information on the Treasure Hunt Challenge, please visit: <http://codecyprus.org>.

The real-time scoreboard/leaderboard



Evaluation

- Empirical evaluation
- Qualitative evaluation – Game Design Elements





Conclusions & Q&A

- Motivation: Gap in coding jobs
- Approach: Gamified event for engaging students
- Implementation: Frogger tutorial & Treasure Hunt competition
- Evaluation: Qualitative & Empirical

- Questions?