RESEARCH OUTPUTS / RÉSULTATS DE RECHERCHE

Novice Programmers

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Novice Programmers: What is the Match between Needs, Concepts and Learning Tools?

Julie Henry (julie.henry@unamur.be) & Bruno Dumas

a large number of individual characteristics

naturalistic intrapersonal verbal-linguistic visual-spatial musical logical-mathematical interpersonal bodily-kinesthetic
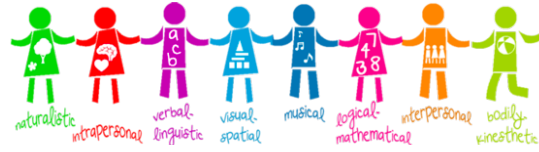
"personal user characteristics"
"prior acquired knowledge and skills"
"system related user characteristics"
Granić and Nakić (2010)

novices' needs

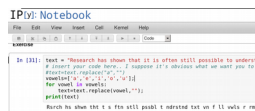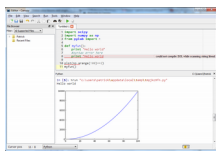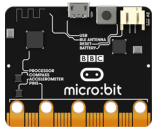Offer everyone the opportunity to learn with the most appropriate tool for each concept

tools
to assist learning

micro:bit

IP[y]: Notebook

programming concepts

variable

loop

conditional structure

function

This research has two main phases:
a first one with an education-oriented goal…

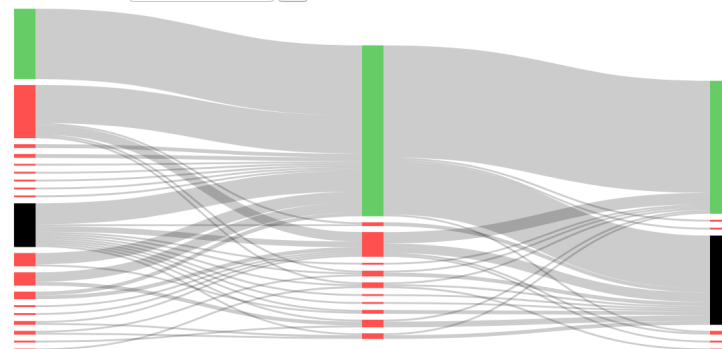Define the **needs** of novices according to their profile

Identify the most appropriate **tool(s)** for each **concept** AND for a particular student profile

How?
surveys
Dehnadi test (2009)
interviews
observations
evaluations
etc.

What for?

```
int a = 5;
int b = 3;
int c = 7;

a = c;
c = b;
b = a;
```

Question number (1-12) : 12   OK

○ a = 0 || b = 12 || c = 3
○ a = 5 || b = 5 || c = 5
○ a = 0 || b = 7 || c = 3
○ a = 8 || b = 10 || c = 12
○ a = 15 || b = 0 || c = 0
○ a = 3 || b = 7 || c = 5
○ a = 12 || b = 15 || c = 10
○ a = 5 || b = 7 || c = 3
○ a = 3 || b = 3 || c = 3
○ a = 7 || b = 7 || c = 7
○ a = 12 || b = 8 || c = 10
○ a = 5 || b = 0 || c = 0
○ a = 5 || b = 3 || c = 7
○ a = 7 || b = 7 || c = 3
○ a = 20 || b = 15 || c = 12
○ a = 7 || b = 5 || c = 3

… and a second one with a HCI-oriented goal consisting of the creation and evaluation of novel learning tools (future work)

Dehnadi, S. (2009). A cognitive study of learning to program in introductory programming courses (Doctoral dissertation, Middlesex University).

Granić, A. and Nakić, N. (2010). "Enhancing the learning experience: Preliminary framework for user individual differences". In: Symposium of the Austrian HCI and Usability Engineering Group. Springer, pp. 384–399.

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precise