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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



"personal user characteristics"
"prior acquired knowledge and skills"
"system related user characteristics"
Granić and Nakić (2010)

novices' needs

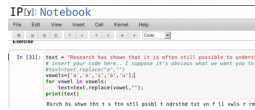
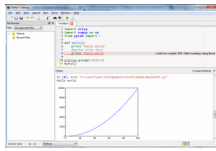
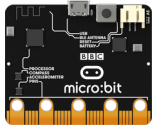


tools to assist learning

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

programming concepts

variable loop
conditional structure function



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

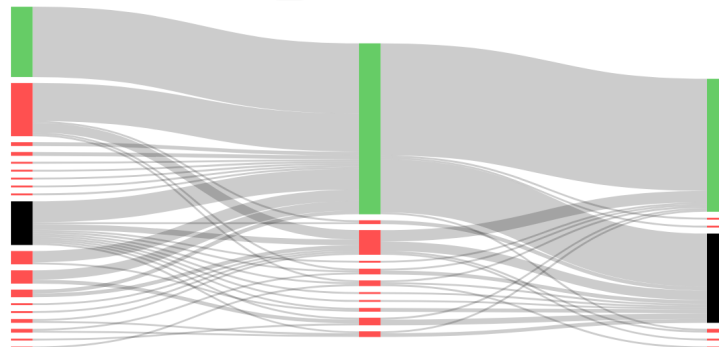
Define the needs of novices according to their profile
Identify the most appropriate tool(s) for each concept
AND for a particular student profile

How?

surveys
Dehnadi test (2009)
interviews
observations
evaluations
etc.

What for?

Question number (1-12): 12 OK



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

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

- 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.