alt-code lab

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ninlabs
Science of code
Hello
Science of Productivity
Activity

• What makes you most unproductive?
Productive workers?

- A programmer takes between 10-15 minutes to resume work.
- Only 10% of times did a programmer resume work in less than a minute.
- A programmer is likely to get just one uninterrupted 2-hour session in a day.
Productivity Tips

How can we generalize an user's work pattern and provide recommendations to help improve their workflow?

- "Your Mondays are the least productive day".
- "You get a lot of work done on Tuesday mornings".
- "You do better work when you listen to music on youtube when you program."
Cognitive Load
Focus Lights + Ambient Reminders
Cognitive Models
A Look Into Peoples‘ Head

Functional Magnetic Resonance Imaging
Language processing:
- Natural and artificial (grammar)
- Semantic processing at word level (meaning)
- Combinatorial aspects

While... that's a loop...
currValue = 1, 2, 3

Relation to Other Studies

Adhering to grammar?

VXV
$PTXVS
VXXS
TPTPS
Problem solving  
Divided attention  
Silent word reading  
Working memory (verbal)
Activity

• Discuss a project idea you would have to improve or evaluate productivity?
Frustration At Scale
(Crowd Learning)
Activity

• Discuss the last time you were frustrated during a programming task?
Python Tutor

So far, over 1.2 million people in over 165 countries have used Online Python Tutor to visualize over 11 million pieces of code, often as a supplement to textbooks, lecture notes, and online programming tutorials.

```python
1 var array = [1,2,3,4,5];
2 var removed = array.splice(3,5);
3 removed;
4 array;
```

How frustrated were you in last coding session?
What was the cause of the problem?
Live Coding .tv

https://www.linkedin.com/pulse/strange-appeal-watching-coders-code-news-from-lakshmi-goyal
Activity

• Discuss with partners other ways you might detect frustration? Other affective state?
Diversity in Online Ecosystems
Activity

Why Don’t You Contribute/Participate on

• Twitter

• Stack Overflow

• Other people’s Github projects?
Crowd Documentation

- Developers may be getting as much as 50% of their documentation from Stack Overflow.

- **More examples** can be found on Stack Overflow than the official documentation guide.

- In **web searches**, Stack Overflow questions are visited 2x-10x more often than official documentation.
Barrier to Contributions

Most contribution come from a highly gamified core: 60% of questions answered by 5% of contributors. 47% of accounts have only posted a question once.

Via interviews with developers, we’ve identified 14 barriers that female participants frequently face:

- Asking, “Have you done your research?” These pressures are reinforced here where it is common for the user to enforce a culture of doing homework before asking a question. Questioning the abilities of users has discouraged them to post questions on the site.
  
  “I think there’s only one case where I was close to posting a question, but then it said do your research, this question might already be there, things like that.” (P4)
Male and Female Rankings

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness of Features</td>
<td>Awareness of Features</td>
</tr>
<tr>
<td>Time Constraints</td>
<td>Time Constraints</td>
</tr>
<tr>
<td>Fear of Contributing to Clutter</td>
<td>Perception of Slacking</td>
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<tr>
<td>Fear of Negative Feedback</td>
<td>Posting is Hard, Friends are Easy</td>
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<tr>
<td>Abstraction Process</td>
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<tr>
<td>Posting is Hard, Friends are Easy</td>
<td>Research Pressure</td>
</tr>
<tr>
<td>Onboarding Hoops</td>
<td>Fear of Contributing to Clutter</td>
</tr>
<tr>
<td>Qualifications</td>
<td>Nothing Left to Answer</td>
</tr>
<tr>
<td>Intimidating Community Size</td>
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<td>No “Good Answer” Guarantee</td>
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</table>

**Figure 1:** Barrier ranking across genders. Green identify barriers females ranked higher and blue identifies barriers males ranked higher.
Female and Male Ratings of Barriers to Contributing on Stack Overflow

Observation 1 - Negative criticism is hard to digest on Stack Overflow.

Observation 2 - Developers want to help but don’t feel like they can based on opportunities to post.

Figure 2: Female and Male Ratings of Barriers to Contributing on Stack Overflow
#ILookLikeAnEngineer

"How do we change our judgments into curiosity about people? Don’t jump to conclusions. Have a little more curiosity."
- Isis Anchalee, OneLogin

I HELP BUILD ENTERPRISE SOFTWARE
#ILookLikeAnEngineer
@IsisAnchalee
Activity

What do you think you could do to improve rates of participation in online communities and improve diversity?
Software Engineering Lab