

# Free/Libre/Open Source Software skills and employment

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# Skills and economic growth

- **Skills development: “the ability to create”**  
FLOSS is a training environment that increases the earning capacity of community participants without any explicit investment in training: a novel form of technology transfer

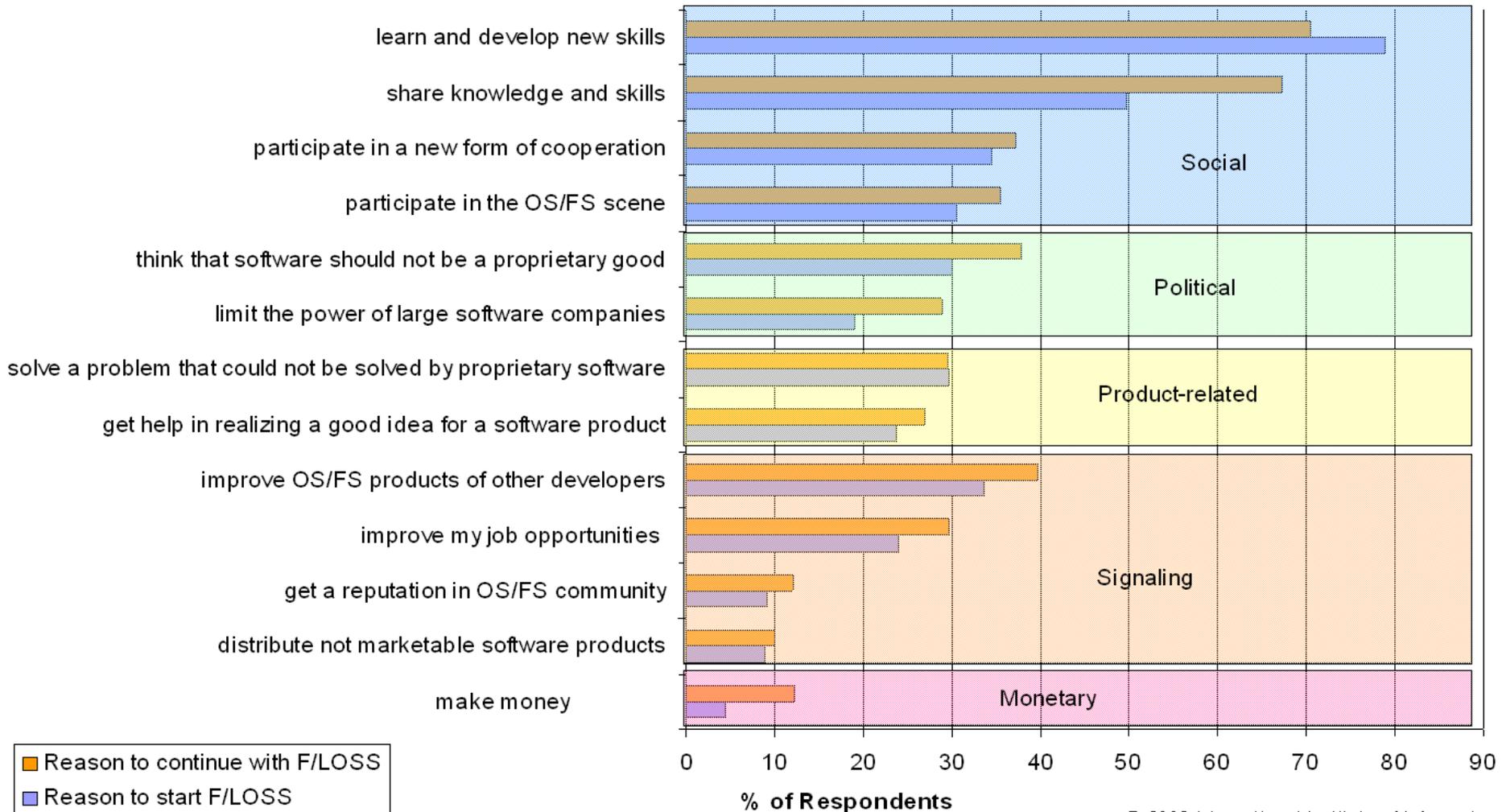
# FLOSS develops local skills

- FLOSS encourages not only passive “use” but active participation in the creative process
- FLOSS provides a very low barrier to entry for creativity – you don’t *have* to be creative but if you want to, you easily *can*

# But do we all want to program?

- How will we know, unless we can try?
- HTML is a programming language – the web only took off because it was open, so people could learn to write their own sites just by “viewing source”, copying and modifying other websites
- “Programming” covers a very broad range of skills from HTML to C; FLOSS allows entry at any point
- Even non-IT Employers appear to encourage FLOSS participation

# Why develop FLOSS?

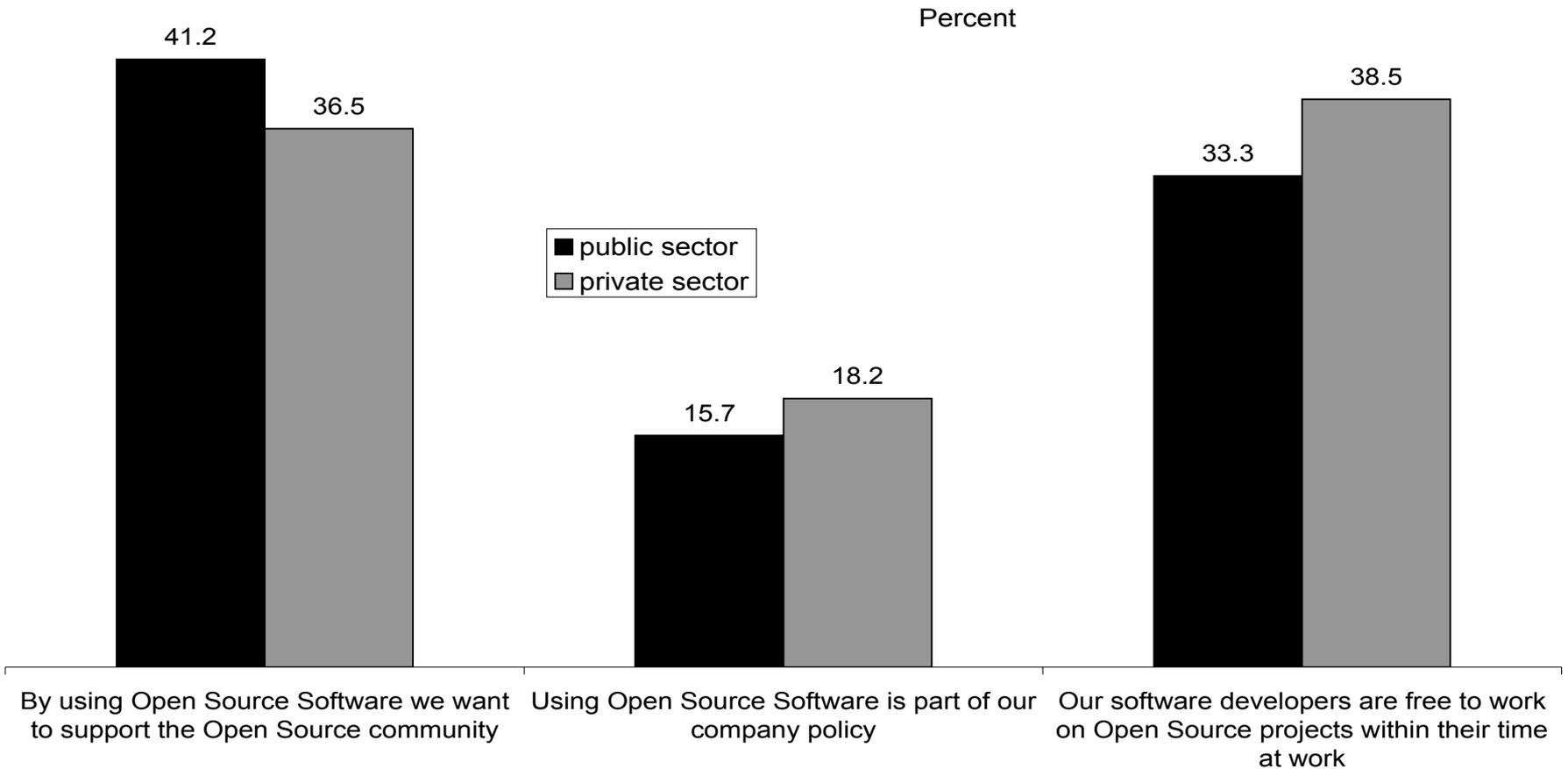


(Source: "FLOSS Final report", Ghosh et al)

# FLOSSPOLS Skills Survey

- How is learning organised in the FLOSS community?
- What mechanisms and patterns can be observed?
- For which purposes do community members learn?
- What is the impact of skills learnt on employment potential?

# Employers' support for FLOSS



# FLOSSPOLS Skills Survey

- Aim: to study both skills learnt and impact on employability.
- Separate questionnaires sent to:
  - developers (worldwide)
  - employers (EU)

# Hypotheses

- Technical skills
  - New participants should learn various skills
  - Experienced participants should learn too
- Management skills
  - New and experienced participants should learn teamwork, coordination and management skills

# Hypotheses

- Legal skills
  - Participants should learn legal skills, more than in formal (non-legal) courses
- General skills
  - Non-English speakers improve their English

# Hypotheses: formal learning

In comparison with formal ICT courses:

- FLOSS provides a better, practical learning environment for many technical skills:
  - Writing re-usable code & debugging
  - Working with code written by others
- FLOSS provides a better learning environment for most legal and teamwork skills, which are rarely taught in formal ICT courses

# Hypotheses: learning methods

- Formalised knowledge transfer less common than self-organised knowledge absorption, *even where* the knowledge is codified rather than tacit
- Methods of “learning by doing” would be seen as more useful for technical skills development than formal training
- (There is no uniform “learning strategy” for skills improvement within the community, even for those with the same level of prior knowledge)

# Methodology

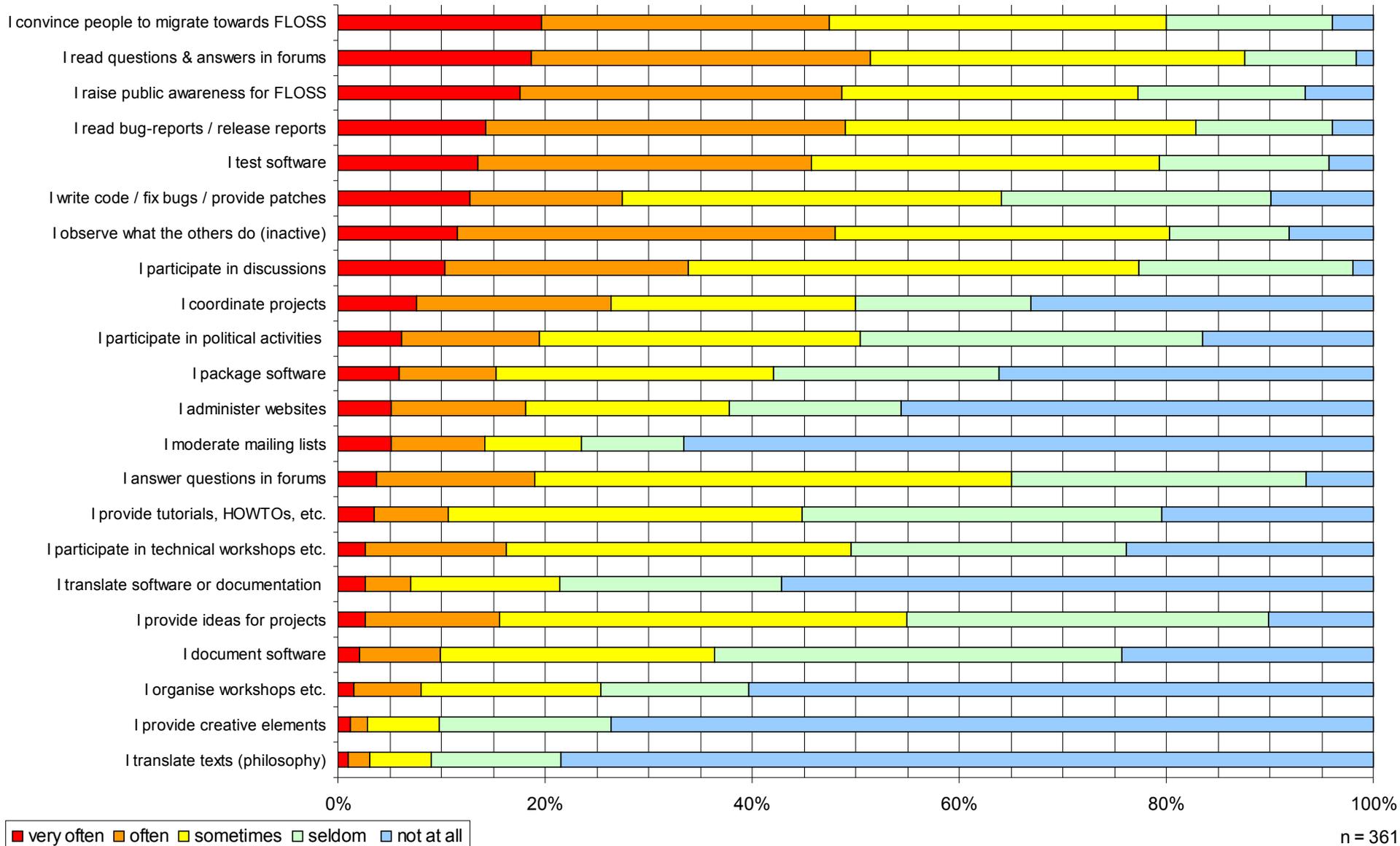
- Personalised survey: Based on FLOSS Developer Survey 2002, addressing 1449 of the more than 2800 respondents
- Response: 361 respondents from 1151 valid addresses (31%)
- Additional 1091 respondents from an open online survey (not personalised, on slashdot etc, results not used today)
- *Employer survey* on value of FLOSS-skills for firms in different industries (software, business services, finance)
  - UK, France, Germany, Spain
  - 147 responses so far (of which 128 are used here)

# Developers: demographics

- 8.7 years of FLOSS participation
- 31 years old
- All earn direct or indirect FLOSS income
- 68% employed, 13% students, 15% self-empl.
- 75% hold a university degree

# Findings: types of participation

"How would you characterise your participation in the FLOSS community?"



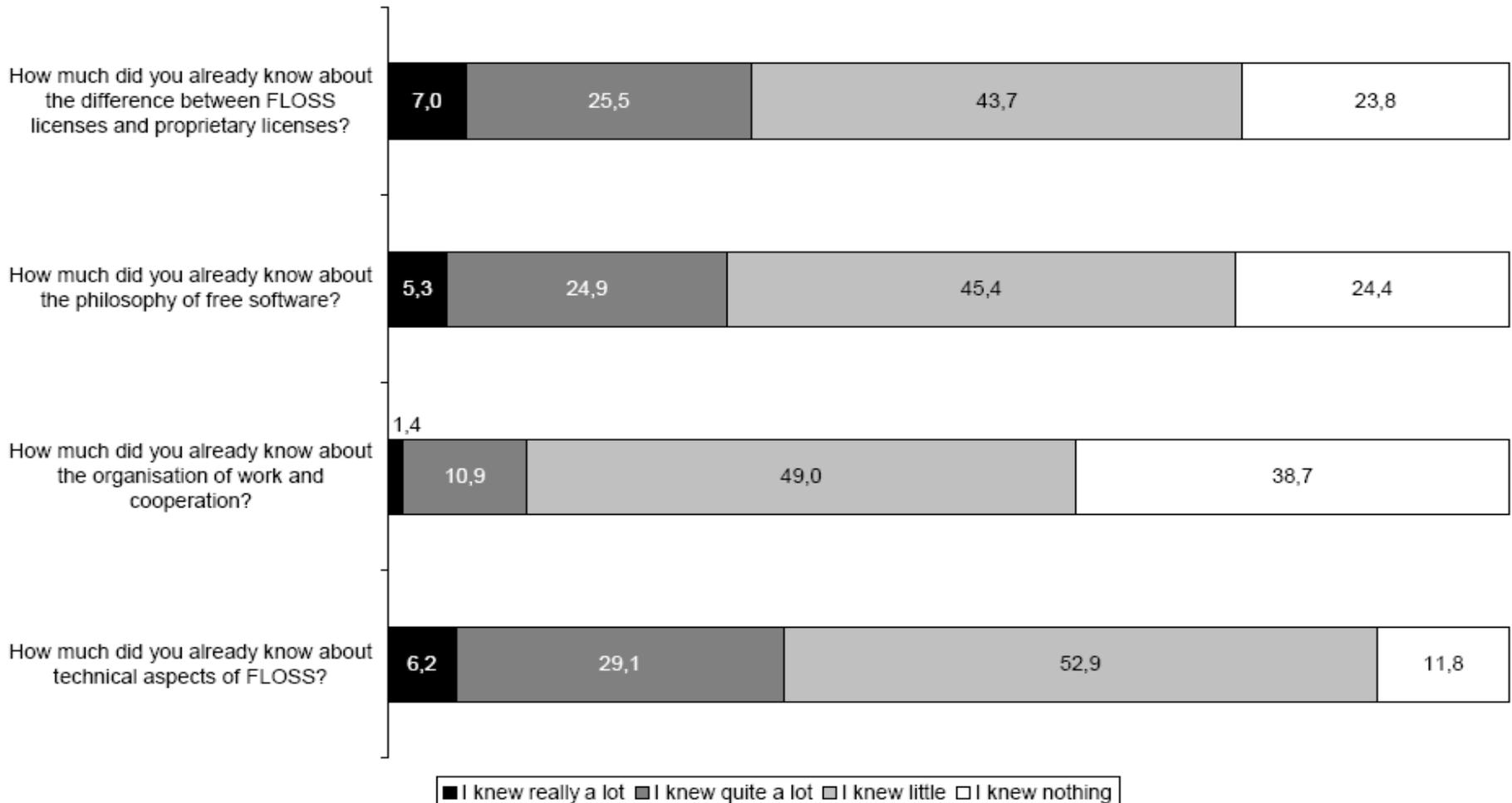
# Findings: types of participation

Principal component analysis shows 6 activities:

- Organisational (workshops, websites, projects)
- Bugfixing / coding / testing activities
- Political activities (convincing others)
- Translation
- Communication (discussion, online forums)
- Support (graphics, documentation, tutorials)

# Prior knowledge

## Knowledge about FLOSS before joining the community



# Prior knowledge and skills learnt

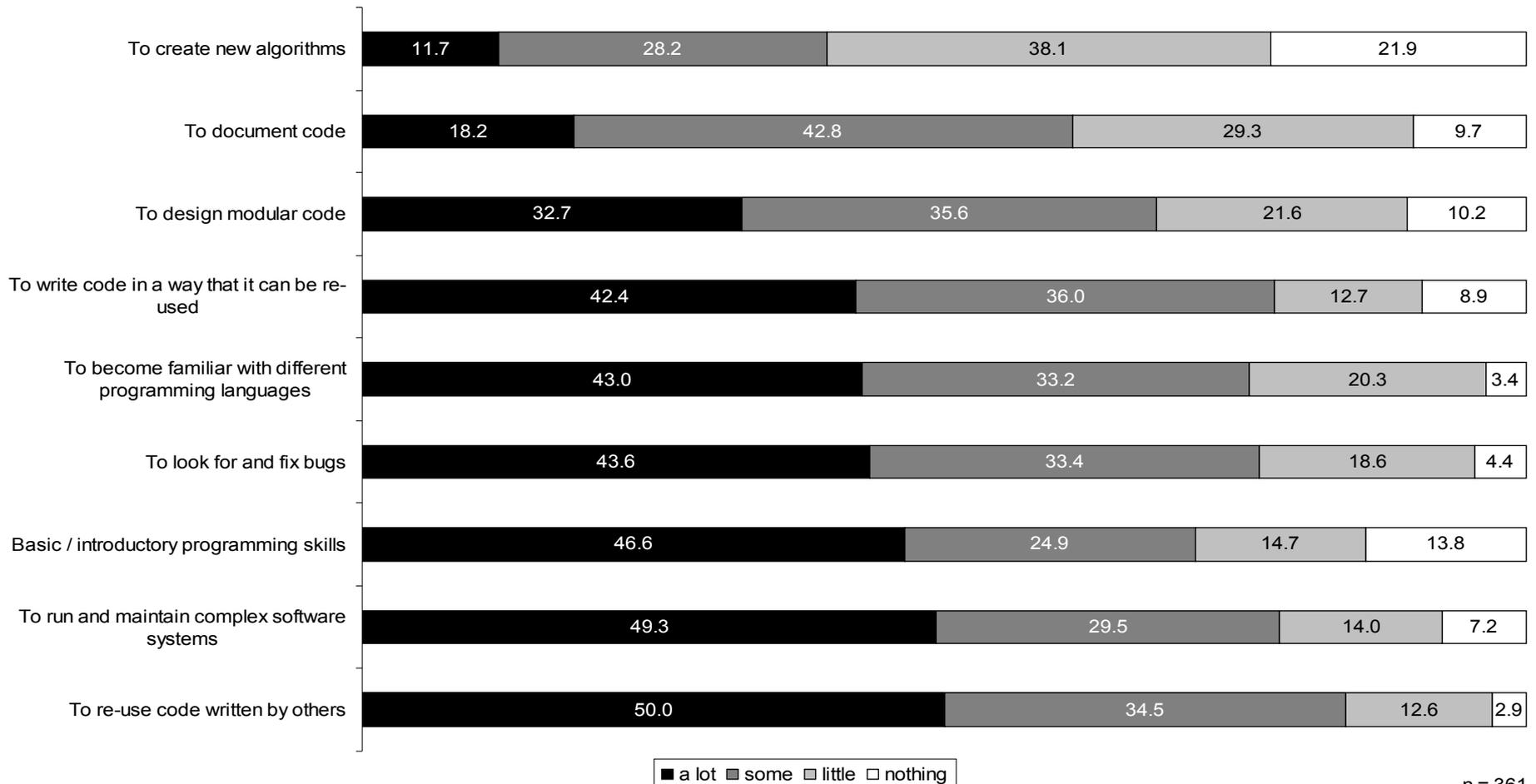
- Those with a lot of prior technical knowledge:
  - *Less* likely to learn English “a lot” (35%) than those without prior knowledge (47%)
  - *Less* likely to learn Basic programming “a lot” (34%) than those without (54%)
  - *More* likely to learn familiarity with progr. langs. “a lot” (49%) than those without (40%)

# Prior knowledge and skills learnt

- Those with a lot of prior knowledge on how “work and cooperation in FLOSS is organised”:
  - *More* likely to learn how to keep a community going (35%) than those without (13%)
  - *More* likely to learn to motivate others (27%) than those without (10%)
  - *More* likely to learn planning and scheduling (13%) than those without (5%)
  - *More* likely to learn to achieve/define targets (24%) than those without (12%)

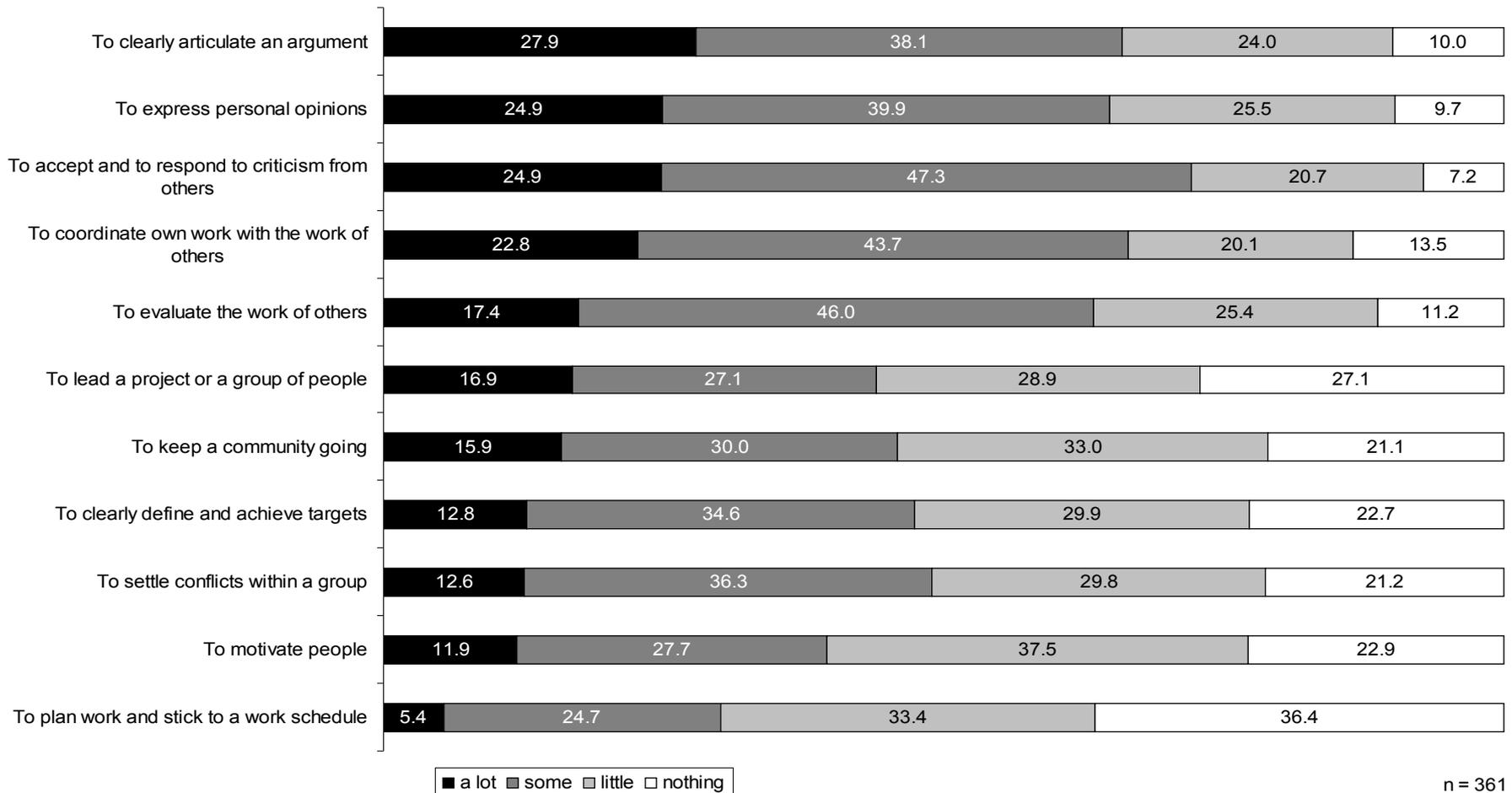
# Skills learnt: technical

Improvement of technical skills through participation in the FLOSS community



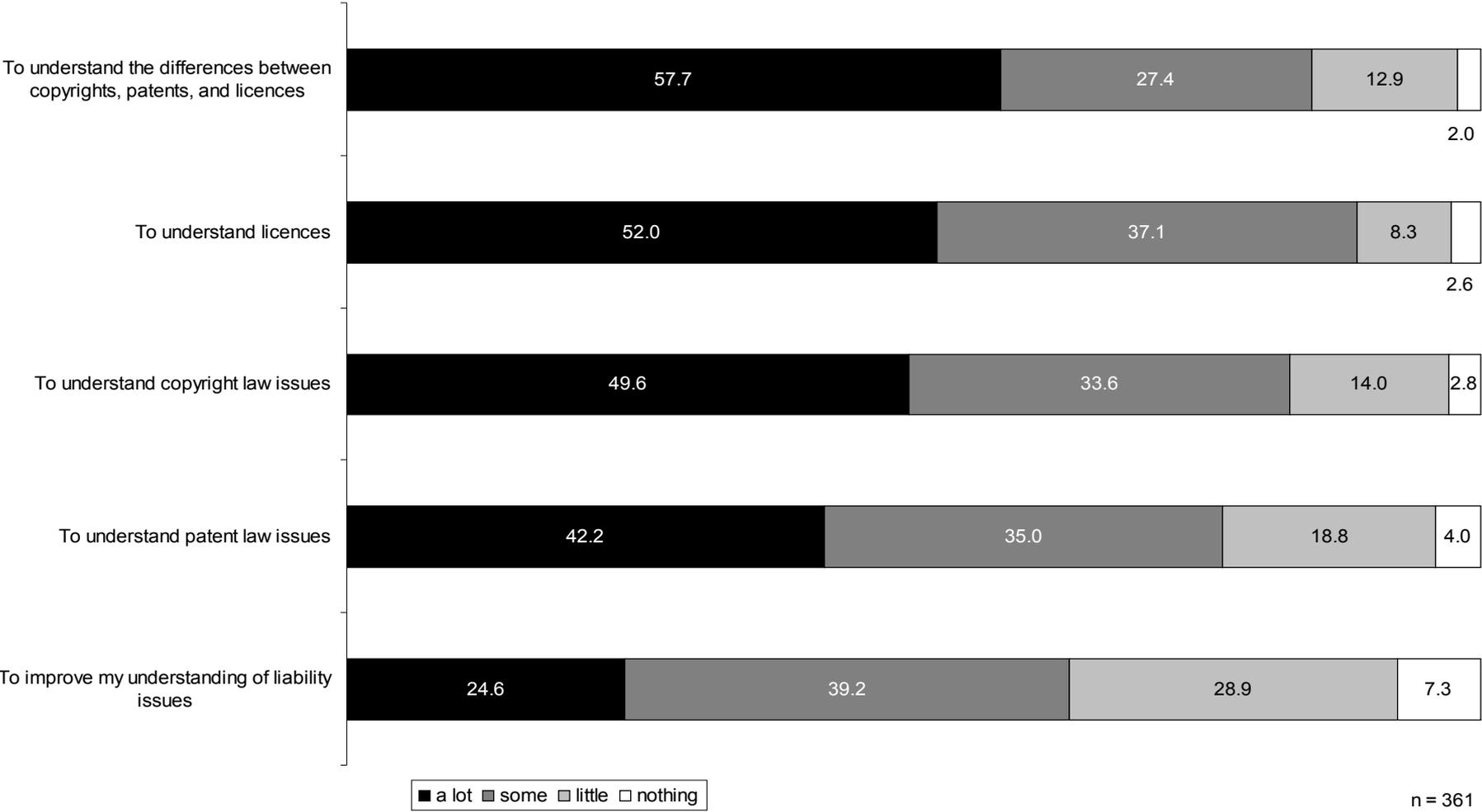
# Skills learnt: management

Improvement of managerial skills through participation in the FLOSS community



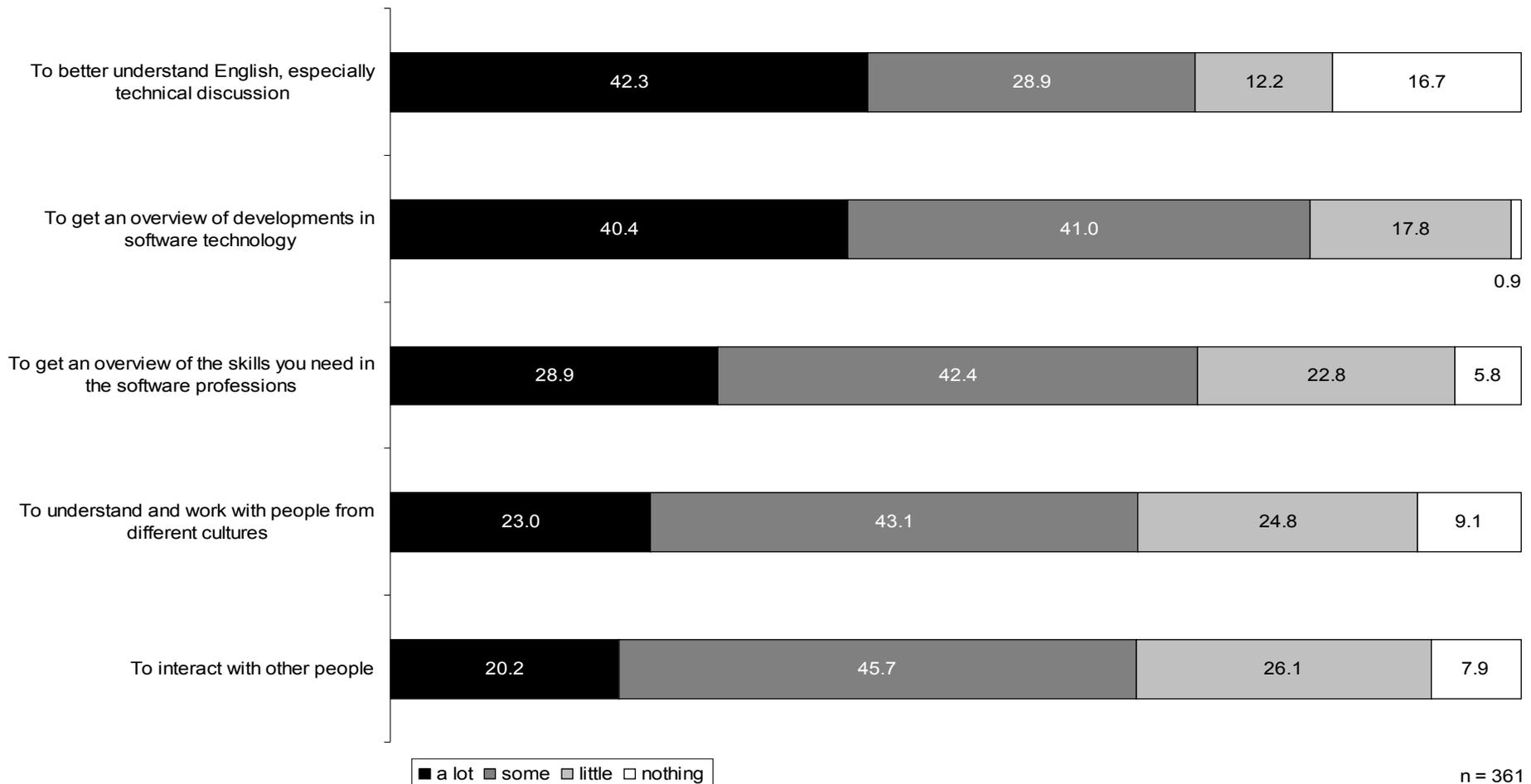
# Skills learnt: legal

Improvement of legal skills through participation in the FLOSS community



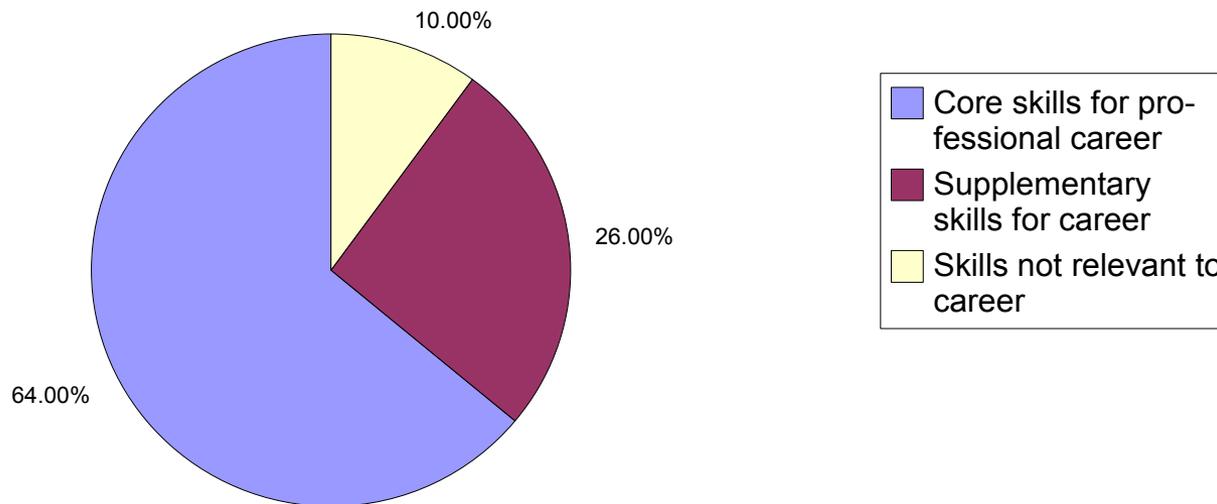
# Skills learnt: general

Improvement of general skills through participation in the FLOSS community



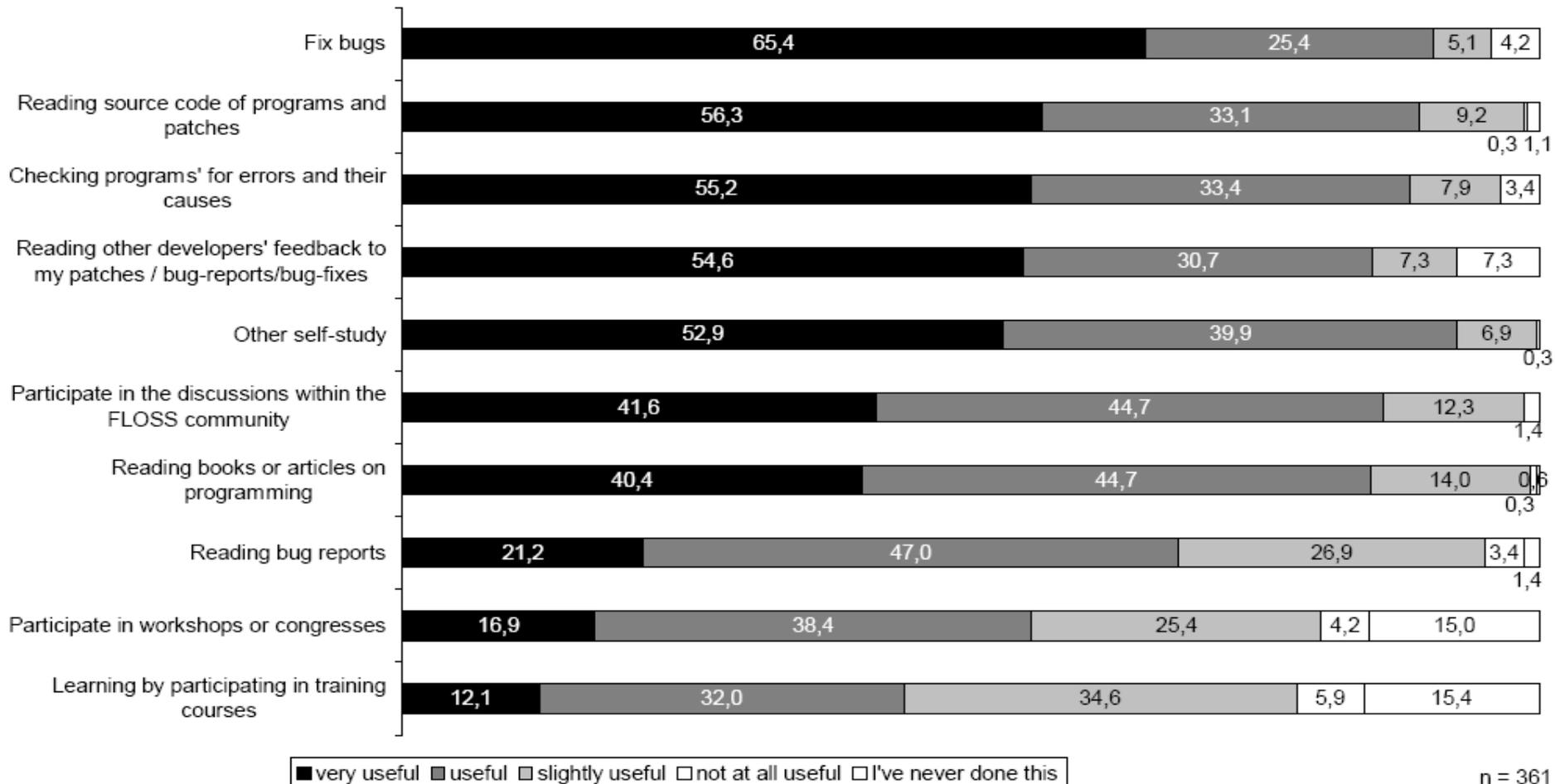
# Importance of skills learnt

Relationship between skills learnt from FLOSS and professional career



# Learning methods

"How useful do you personally consider the following activities as ways of learning technical skills?"

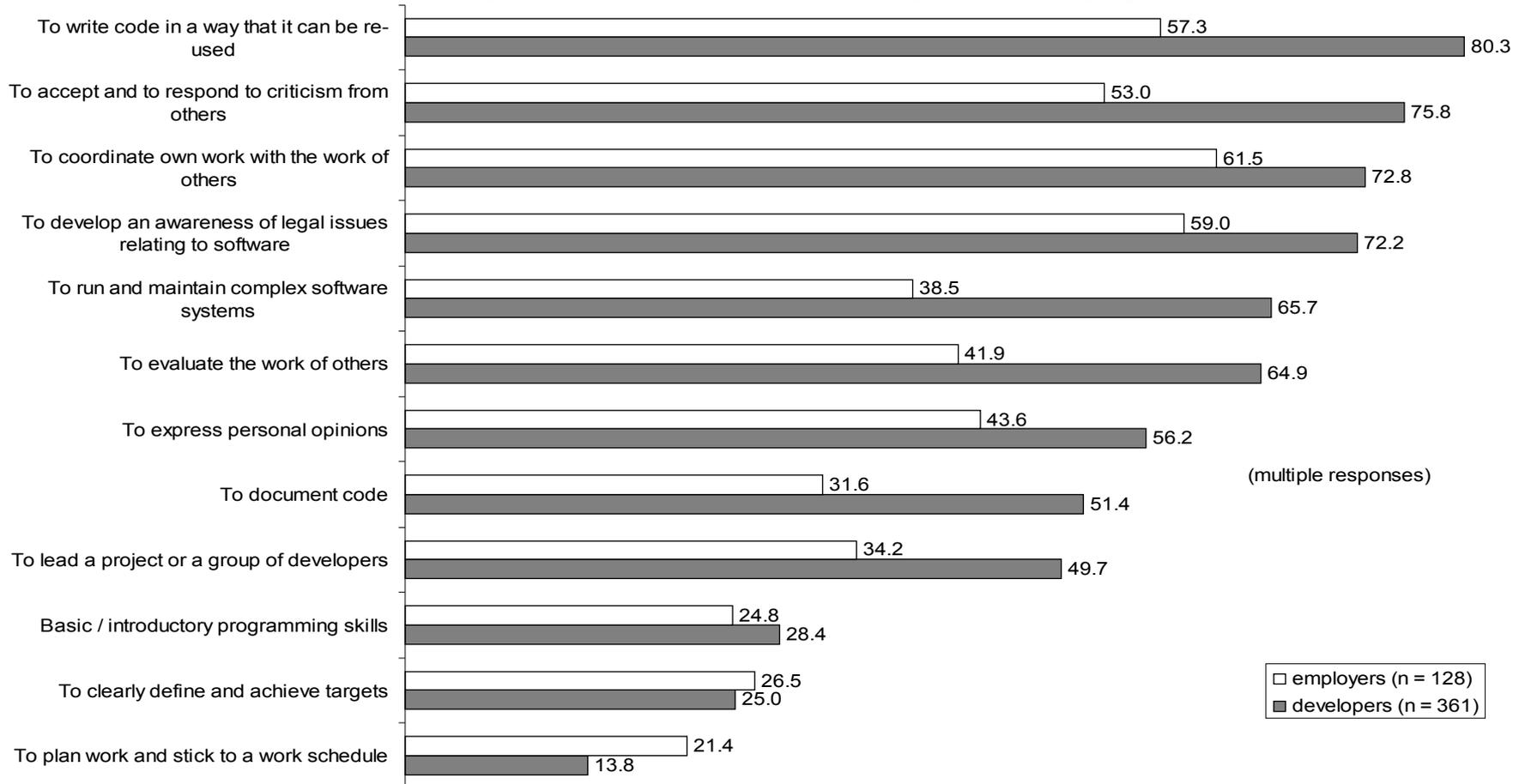


# Prior knowledge and learning

- Those with a lot of prior technical knowledge:
  - *Less* likely to learn through feedback from other developers
  - *More* likely to learn through books or articles
  - *More* likely to learn through reading source and discussions
  - *Less* likely to learn through fixing bugs or reading bug reports

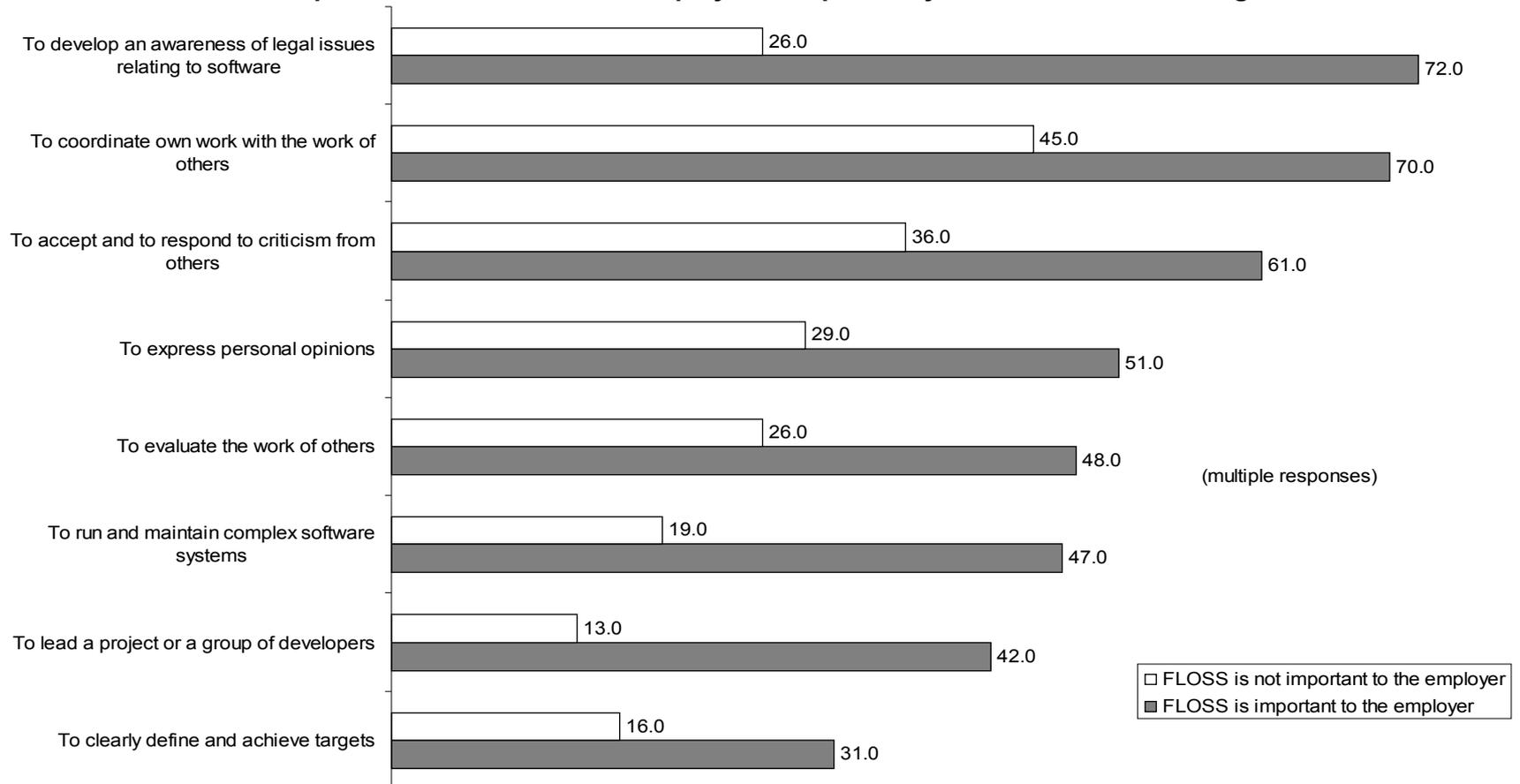
# Learning compared to formal course

**"Which of the following skills can be better learnt within the FLOSS community as compared to a formal computer science course?" - Developers' and employers' view**



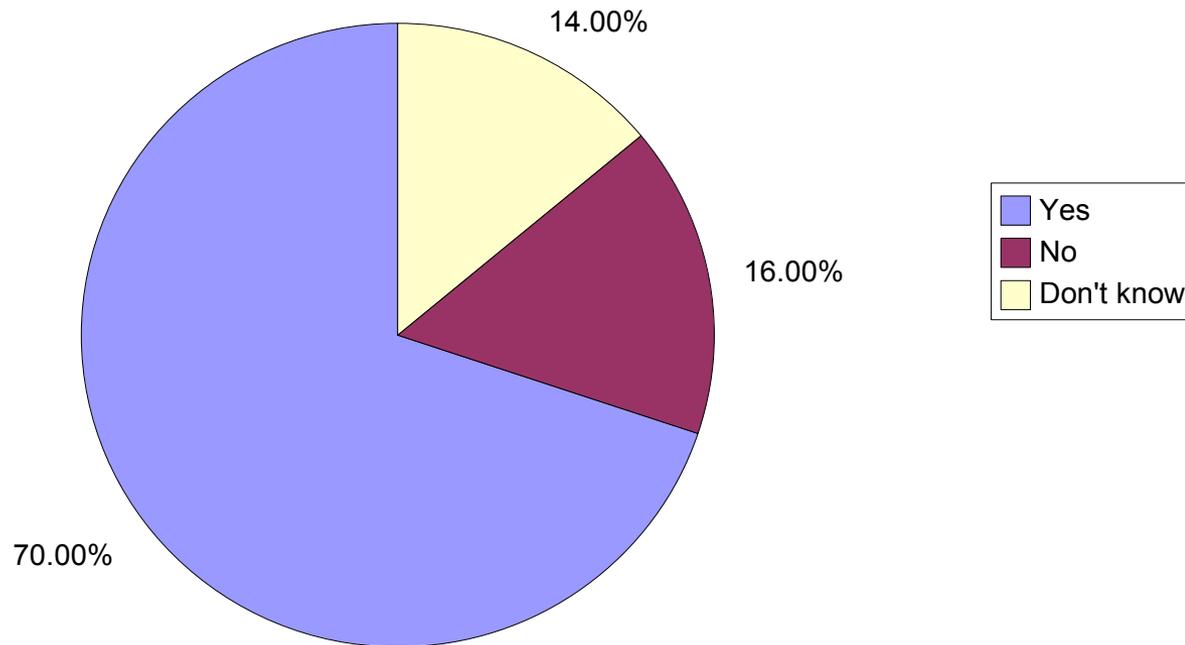
# Learning compared to formal course

**"Which of the following skills can be better learnt within the FLOSS community as compared to a formal computer science course?" - Employers' response by role of FLOSS in the organisation**



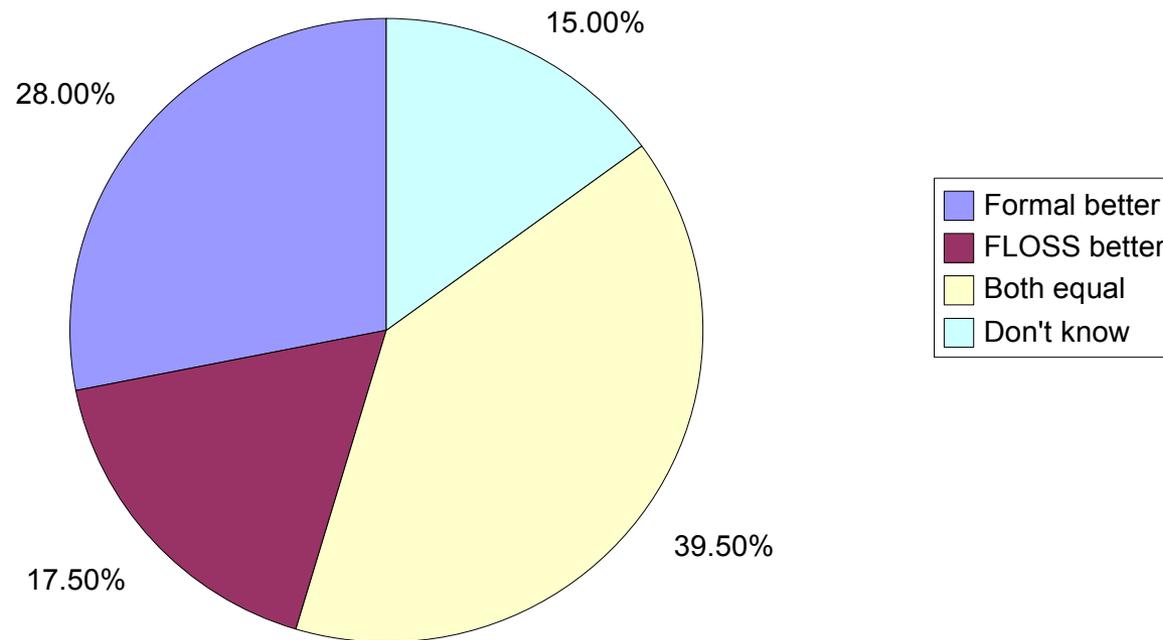
# Compensation for no formal degree?

**Developers: Do you think that proven participation in the FLOSS community can compensate for the lack of formal qualifications, like certificates or university degrees?**



# Compensation for no formal degree?

**Employers' perspective: While hiring, how do you compare a formal computer science qualification to practical experience as a FLOSS developer?**



# Compensation for no formal degree?

The employers' perspective: (n=114)

**Comparison: formal qualification vs. practical FLOSS experience \* How do you assess the role of FLOSS within your organisation? Crosstabulation**

% within How do you assess the role of FLOSS within your organisation?

		How do you assess the role of FLOSS within your organisation?		Total
		important	hardly important	
Comparison: formal qualification vs. practical FLOSS experience	the formal qualification is better	24.1%	38.7%	28.1%
	the formal qualification is worse	20.5%	9.7%	17.5%
	the formal qualification is equal	44.6%	25.8%	39.5%
	I don't know	10.8%	25.8%	14.9%
Total		100.0%	100.0%	100.0%

# Value addition to formal degree?

The employers' perspective: (n=114)

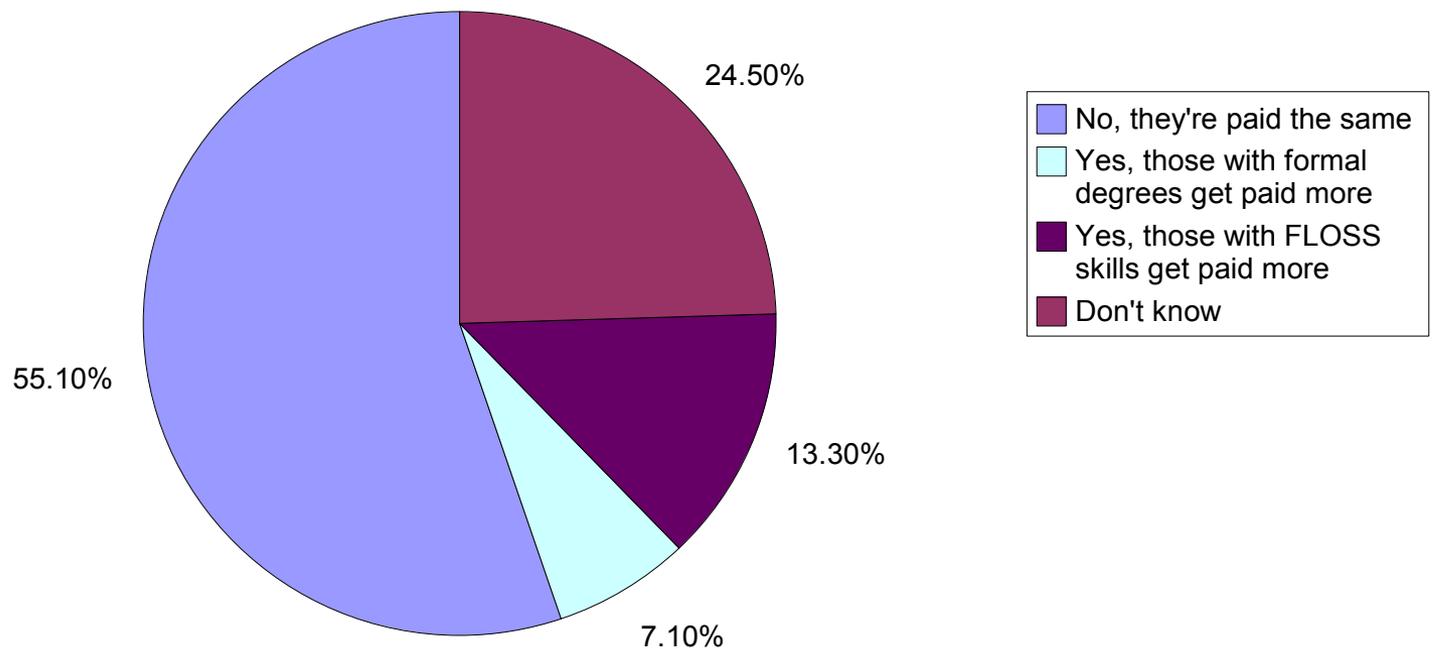
## Crosstab

% within How do you assess the role of FLOSS within your organisation?

		How do you assess the role of FLOSS within your organisation?		Total
		important	hardly important	
Do you think that FLOSS experience adds value to a formal computer science qualification?	Yes	92.8%	67.7%	86.0%
	No	4.8%	9.7%	6.1%
	I don't know	2.4%	22.6%	7.9%
Total		100.0%	100.0%	100.0%

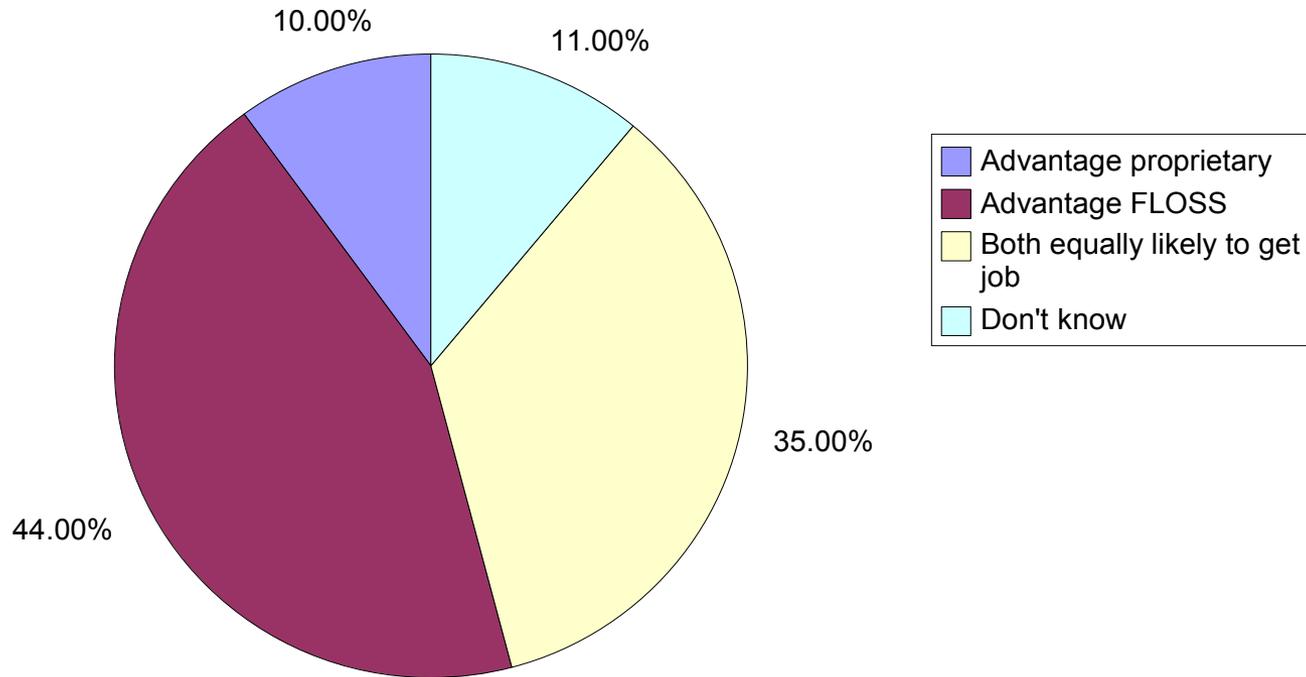
# Compensation for no formal degree?

**Employers' perspective: Do you offer prospective employees with FLOSS experience different pay than those with a formal degree?:**



# FLOSS skills valued on the job market

**Developers: (Dis)advantage on the job market for someone whose past experience is as a proven developer of FLOSS software component vs someone whose past experience is as a proven developer of proprietary software component:**



# FLOSS skills valued on the job market

The employers' perspective: (n=114)

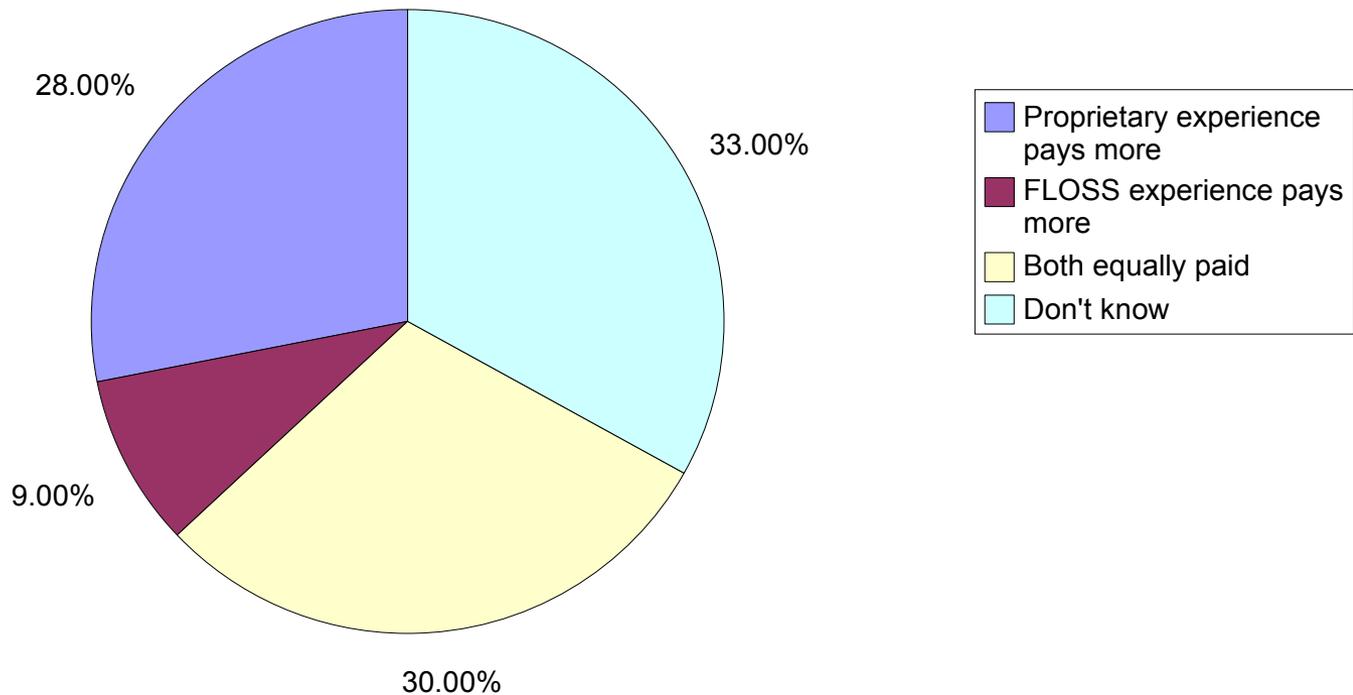
## Crosstab

% within How do you assess the role of FLOSS within your organisation?

		How do you assess the role of FLOSS within your organisation?		Total
		important	hardly important	
Preference for hiring person with proprietary software skills (A) or with FLOSS skills (B)	Person A (proprietary)	3.6%	22.6%	8.8%
	Person B (FLOSS)	60.2%	12.9%	47.4%
	These differences would not influence my preference	32.5%	51.6%	37.7%
	I don't know	3.6%	12.9%	6.1%
Total		100.0%	100.0%	100.0%

# FLOSS skills valued on the job market

**Developers: Earning differences on the job market for past developer of FLOSS software component vs past developer of proprietary software component (regardless of whether job is with proprietary software or FLOSS):**



# In conclusion

- Skills are learnt in FLOSS community
- Learnt skills not just technical, indeed legal skills are learnt “a lot”
- Those with prior skills learn new ones, especially relating to bug-fixing, writing reusable code
- Wide variety of learning strategies
- Even those taking formal courses rate it relatively poorly as a learning environment

# In conclusion

- Several skills are learnt better than in formal courses (learn-by-doing skills – reusable code, bug-fixing, teamwork and coordination)
- Proven FLOSS experience *can* compensate for lack of formal degrees in order to get a job
- Employers seem to agree, though awareness of FLOSS among employers increases their perceived value of skills learnt from FLOSS.
- But developers feel those with proprietary experience often get paid more

# More information

- FLOSSPOLS: <http://flosspols.org>
- FLOSS Project report (2002)  
<http://flossproject.org/report/>
- FLOSSWorld: <http://flossworld.org>