

Impact of the four French RISC-V Contests on Education and Research

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WHY A RISC-V STUDENT CONTEST IN FRANCE?

Encourage students working on processor architecture
 Promote RISC-V and OpenHW in academic laboratories
 Expand RISC-V and OpenHW communities in France
 Strengthen RISC-V cooperation between academics and industry
 Ease access to RISC-V educational resources

THE CONTEST AT A GLANCE

Based on CVA6, an open-source RISC-V application core, curated by members of the OpenHW Group, targeting industrial-grade quality
 Open-source technical kit available from Thales in November
 Teams of 2-4 students registered by their universities and supervised by a professor
 6 months to design a solution to address a specific challenge
 Prize and award for the 2 best ranked teams
 Some universities include the contest in the curriculum time.
 Other teams work in their leisure.

Year	CVA6 Challenge	Teams
2020-2021	Optimize CVA6 performance and area	12
2021-2022	Optimize CVA6 energy efficiency	12
2022-2023	Defeat cyber-attacks under Zephyr OS	19
2023-2024	Accelerate digit recognition (CNN) with ISA extensions	13



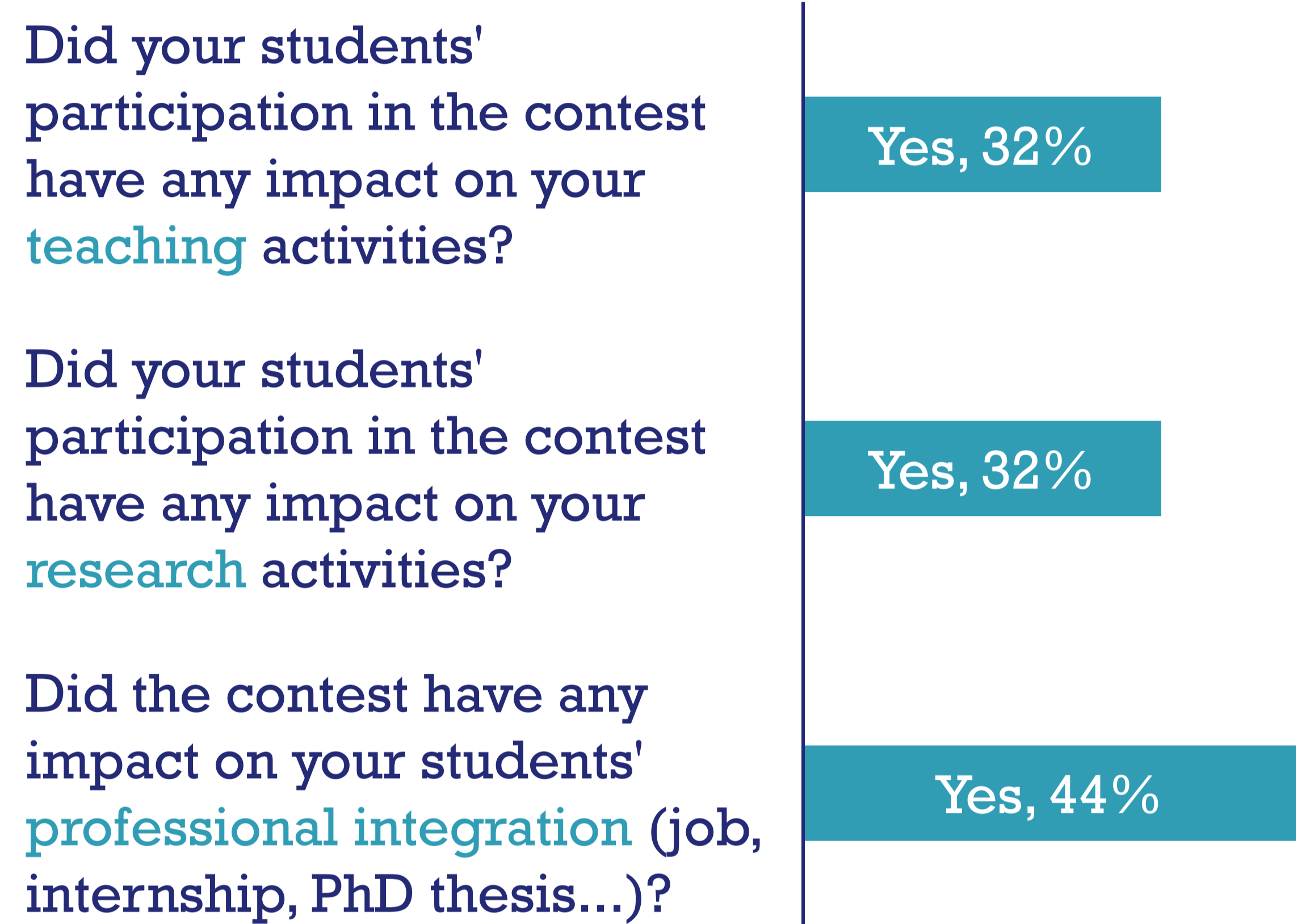
LESSONS LEARNED

- **Main difficulty: set up the complete framework to use CVA6 with the required tools**
 - Reuse same tools and FPGA board every year
 - Make setup as easy as possible (e.g. Docker containers)
 - Get a partnership to provision EDA and FPGA board
- Careful selection of every year's topic to motivate students and focus on computer architecture, not applications
- Choose a duration as long as possible (e.g. 6 months) to accommodate diverse academic calendars
- Evaluate results according to a single KPI (e.g. acceleration factor) to keep focus and avoid subjectivity
- Replay students' results in a reference environment to compensate for local variations (tool versions...)

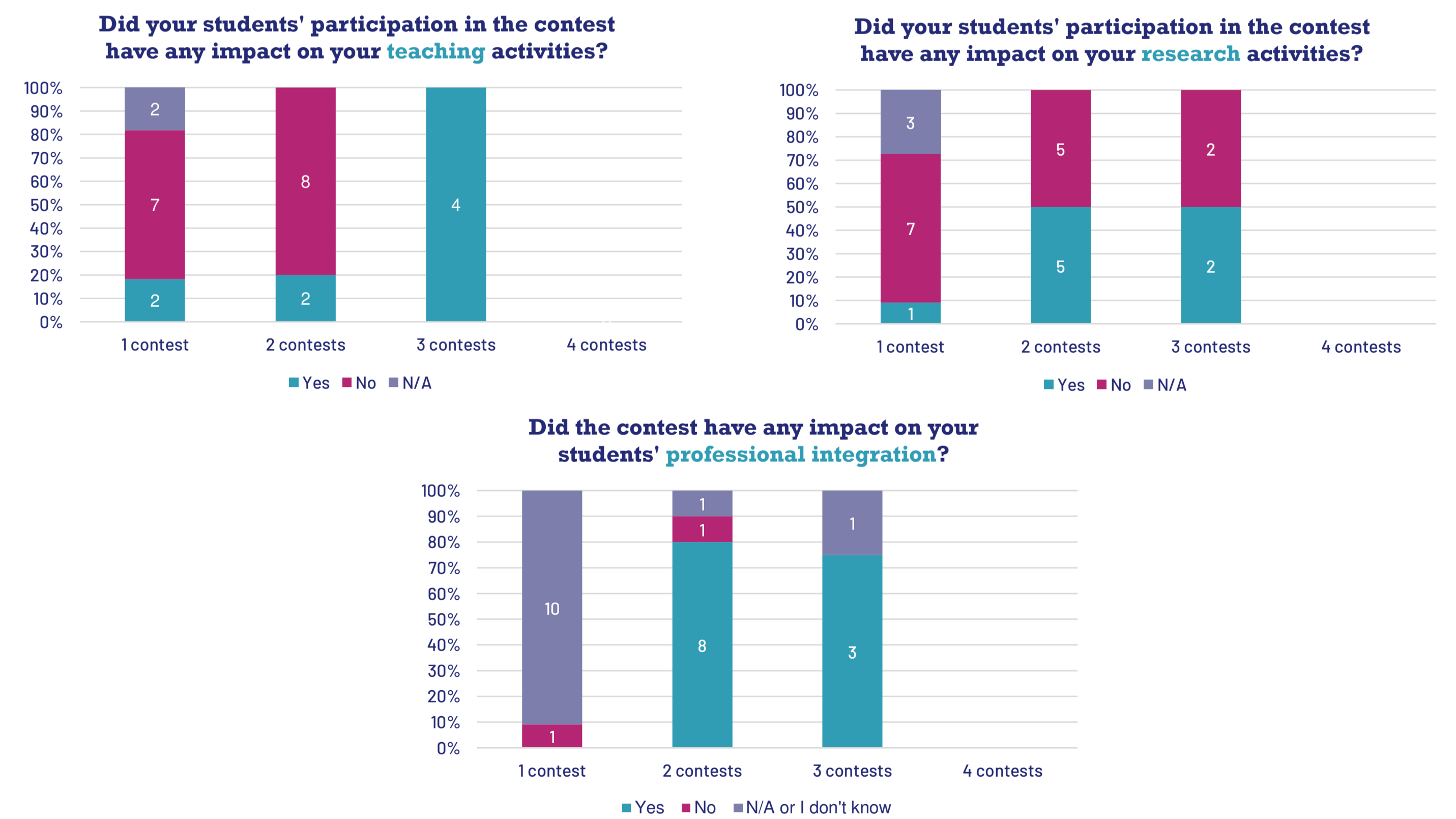
A POPULAR CONTEST

20 universities **180 students**
56 teams **50 supervisors**
 over 4 years

IMPACT SURVEY



IMPACT INCREASES WITH #PARTICIPATIONS



MOTIVATIONS TO ATTEND

RISC-V
 Processor architecture
 Year's specific challenge
 Competitive spirit
 Real-life complex industrial project



<https://github.com/thalesgroup/cva6-softcore-contest>

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