Continuous Improvement of an XP Laboratory course: An 18 year history

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Slides available on: tinyurl.com/LabXP
About me
Beforehand, many changes have taken place in the last 18 years on Agile Methods?
How agile methods were / are considered?

2001
- Almost only for hardcore programmers
- Not very well known
- In academia:
  - Agile empirical studies were scarce

Today
- Mainstream
- Agility is a must
- In academia:
  - Plenty of agile empirical studies
## How to teach Agile Methods? (our experience)

### 2001
- Very strict rules
  - Impose the 12 practices
- Agility was new for everyone
- Focus on the methodology

### Today
- Adaptation is imperative
  - We start with the original XP practices
- The students "think" they are already agile
- Focus on adapting to the context
Where was the focus? eXtreme Programming

2001
- Practices
- Principles
- Values

Today
- Practices
- Principles
- Values
Now, the agenda

- Introduction
- The Inception
- The Turning Point
- Student Testimonials About the Course
- What We Learned
- Final Remarks
- Acknowledgments
Introduction

- Teaching agile methods in academic environments: a challenging and complex task
- At the University of São Paulo, in the Computer Science Department, we created the XP Laboratory course for undergrad and graduate students
- XP Laboratory: An agile environment
  - As similar as possible to the industry scenario
  - Real projects with real customers
  - Proper infrastructure and support
  - Diverse roles:
    - instructors
    - mentors and meta-coaches
    - coaches and developers
    - customers
The Inception

- Kent Beck's Keynote on the Educator Symposium at OOPSLA, 2000
  - Fabio Kon
- OOPSLA Educator Symposium at OOPSLA, 2002
  - Alfredo Goldman
- Two colleagues
  - Paulo Silva e Silva
  - Carlos Ferreira
Timeline

2001
- Only XP 12 initial practices
- 15 Students
- 4 Professors
- Roles: Developers and Coach
- Internal Clients

2005
- Practices from XP, Scrum and Lean
- Around 25 students
- New role: Meta-coaches
- Internal & External Clients
- Open Source Projects

2010
- Around 40 students
- Graduate students
- Empirical Studies
- Stand-up Meetings for Coaches

2015
- More Dynamic Agenda
- More External Involvement
- "Lot's of Clients", need for a GA
- Mob Programming
- Code Metrics
- Technical Debt

- Last additions
- Help from a Design Professor (Architecture)
- Linux Kernel Team
- Parallel of Porto’s Experience with Ademar Aguiar

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A team from XP Laboratory 2018

Figure 1 - An XP Laboratory team.

Figure 2 - Joe Yoder, a mentor of the XP Laboratory
# XP Lab in numbers

## Table 1. Number of students and projects per edition

<table>
<thead>
<tr>
<th>XP Lab Edition</th>
<th>Undergraduate</th>
<th>Graduate</th>
<th>Advanced</th>
<th># of Meta-coaches</th>
<th># of Projects</th>
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A rich lab for Empirical SE Studies

Figure 4 - Empirical studies and publications at the discipline editions.
Some studies conducted "at the Lab"

- Being Extreme in the Classroom: Experiences Teaching XP, 2004
- Tracking the Evolution of Object-Oriented Quality Metrics on Agile Projects, 2007
Some more studies conducted "at the Lab"

- Open Source and Agile Methods: Two Worlds Closer than It Seems, 2010
- Reinforcing the Learning of Agile Practices Using Coding Dojos, 2010
- An Approach on Applying Organizational Learning in Agile Software Organizations, 2010
Even more studies conducted "at the Lab"

- From Manufacture to Software Development: A Comparative Review, 2011
- Genesis and Evolution of the Agile Movement in Brazil - Perspective from Academia and Industry, 2011
Papers published about the XP Lab

- Uncovering steady advances for an extreme programming course, 2012
- The evolution of agile software development in Brazil - Education, research, and the state-of-the-practice, 2013
Recent research

- The impact of technical debt
Recent research

- Mob programming
Current research

- Linux Kernel Development using Agile Methods
- I was skeptical at the beginning :)
- Now, we have a group of kernel developers at IME USP
The clients from 2018
The clients from 2018
Applying Agile to the course itself

- Lunchtime as a break to exchange valuable experiences
- Whole-class retrospectives
  - Starfish diagrams and Fishbowl discussions
- Mini-lectures and Lightning talks
  - The topic was decided as needed
- Rotation of team members across teams
- Brainwriting
- Coding dojos
- Test Day and Refactoring Day
- Super-pairing & Mob programming
Questionnaire respondents’ profile

Figure 5 - The actual respondents’ profile and their first contact with agile methods.
Questionnaire respondents’ profile

Figure 7 - Respondents’ participation in the course.

![Bar chart showing respondents' participation in the course.](image)

- Developer: 22
- Coach: 13
- Meta-coach: 4
- Customer: 1
- Researcher: 1
- Lecturer: 3
Overview of students’ testimonials

“I believe it was the most significant course I had on my bachelor degree. (…)”
(Developer in 2012)

“This was one of the disciplines most connected with the market reality.”
(Developer in 2003, Coach in 2004 and Customer in 2011)

“(…) I came to the conclusion in my first two years of work that most of the difficulties of teams and organizations were not code, engineering, technology - but people, processes, and the whole context surrounding them. (…)”
(Developer in 2009)

“(…) So I see this course as a quality and pioneer initiative in Brazil. (…)”
(Coach in 2018)
Students’ perception of main course topics

“Team development, a software project with real impact on society and companies, applying agile methodologies.” (Developer in 2018)

“Pair programming, refactoring, automated testing, teamwork (not work in group), evolutionary design, short iteration planning, stories writing.” (Developer in 2003 and Coach in 2004)

"Agile Manifesto, XP methodology practices, agile practices of software project management, project refactoring, proactive/collaborative/self-Management Work, efficient and transparent communication process, software testing, emerging software development tools/technologies." (Coach in 2018)
Many of our former students are involved in
What we learned

- There is no closed formula
- To provide real projects, environment and support
- Apply agile practices to improve the course itself
- Not only to teach Agile Methods, but also to provide a space to do empirical software engineering experiments
- The most important value of Agile Methods, is Continuous Improvement, we always have to keep seeking ways to be better Tomorrow than Today
Final Remarks

- We cannot just teach **Agile**, we have to be committed with it and truly believe on all the values behind it
- We learned to see the problems faced during the course not as obstacles, but as challenges to be solved, using the Agile values
- To improve not only our adaptation skills, but also showing to the students that they could also do the same
- To spread the Agile mindset to many people who are also sharing their experiences.
Acknowledgments

● Shepherd Rebecca Wirfs-Brock, she convinced us that this was a history worth to be spread

● Fabio Kon, Carlos Ferreira and Paulo Silva and Silva, the professors involved in the first edition of the course

● All meta-coaches: Hugo Corbucci, Mariana Bravo, Renan Mello, Claudia Melo, Daniel Cukier, Thiago Colucci, Graziela Tonin, Diego Camarinha, Rafael Manzo, Thiago Nunes, Ian Carvalho, Diogo Pina, Wilson Mizutani, Paulo Meirelles

● A special thanks to Joseph Yoder, Danilo Sato, Maurício Aniche who shared their knowledge with our students.

● We also have to thank all the students and clients that helped us during all these years!
Take away:

Continuous Improvement

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