Creation of a Mentoring Program for Improving the Education of Industrial Engineers

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Summary

• Introduction
• Objective of case study
• Mentoring in some words
• Research Method
• First Results and Conclusion
• References
• **Issue**: Students have difficulties on technical analysis, **attitudes and behaviors** as **interns**.
  - Industrial Engineering course **focus**: knowledge and skill development
  - Internship focus: to **train and develop** students as engineers
  - Detection of the problem: **feedback** from interns and supervisors at the Supervising Internship Classes I and II (UERJ/FAT - Brazil)
Objective - case study

• To create:
  • a mentoring program
  • to support the development of industrial engineering students as future engineers
  • to contribute in better professional performance

• Perimeter:
  • industries of the RIP region (cities of Resende, Itatiaia and Porto Real, Rio de Janeiro State, 2nd Automotive Pole in Brazil)
Mentoring in some words

• Main characteristics:
  – An experimented mentor (engineer with 4 years experience)
  – A mentee
  – Commitment, communication, confidentiality and transparency
  – Feedback – action plan – results evaluation
  – This case study: mentee chooses his/her mentor

• Benefits:
  – For mentees:
    • support for professional development as engineers
    • opportunity to show skills and potential for future activities
    • improvement of self-confidence
  – For mentors:
    • Practice people leadership and feedback (STEWART, 2003)
Mentoring in some words

• Mentoring is a trial for transferring experience and expertise from more experienced professional (mentor) to a less one (mentee) inside an organization. It works as a kind of “shortcut” where the mentor supervises the activities and performance of a younger colleague who should learn quickly (STEWART, 2003)
PDCA Method developed in 4 semesters in the subjects Supervising Internship Classes I and II (UERJ)

1st cycle: Focus on Feedback
Supervisor ---> Intern

2nd cycle: Focus on Mentoring
Mentor ---> Mentee

3rd cycle: Focus on Mentoring
Mentor ---> Mentee

4th cycle: Focus on Mentoring
Mentor ---> Mentee

Plan. Definition of mentoring program

Do. Application mentoring program by mentors and mentees

Check. Checking and feedback about program

Act. Program modification, looking for continuous improvement

PDCA method applied in 4 semesters for the mentoring program improvement
Research Method

• **1st PDCA cycle**: Focus on Feedback

- **P.** Creation feedback practice between supervisor – intern
- **D.** Discussions professors/students: general competencies/behaviors at work
- **D.** Questionnaire for feedback supervisor - intern (points to be improved)
- **D.** Individual meetings with professors to provide orientation
- **C.** Discussion: the need of support to improve these “weak” points
- **A.** Research methods of mentoring program (academy and companies)
- **A.** Proposal first version for mentoring program for interns at industries
Research Method

• **2nd PDCA cycle**: Focus on Mentoring 1st version

P. Creation first version for mentoring program for interns at industries
P. Mentee chooses an engineer with at least 4 years of experience inside the company
D. Orientation for mentors, mentees and company human resources departments
D. Self-evaluation of general competencies for mentees about points to be improved
D. Practice of mentoring between mentors/mentees in 4 meetings along 4 months
  . Mentor and mentee define 2 points of improvement for the mentee
  . They discuss how to make it better
D. Follow up mentoring program in supervising internship classes by the professors
D. Creation of an optional activity for students not under internship programs
C. Application 2 questionnaires (mentor/mentee) to “feed” PDCA cycle
A. Proposal of modifications for mentoring program next cycle
Research Method

- **3rd PDCA cycle**: Focus on Mentoring 2nd version

**P.** Creation standard version mentoring program based on feedback previous cycle

**D.** Practice of mentoring between mentors and mentees in 3 meetings along 3 months

**D.** Follow up mentoring program in supervising internship classes by the professors

**D.** Creation of a formal presentation from mentees to professors to check mentoring practice

**C.** Application 2 questionnaires (mentor/mentee) to get feedbacks and “feed” PDCA cycle

**C.** Application of a questionnaire about relevant competencies and skills of industrial engineering considered by ABEPRO (*). The research output was a list of the most relevant ones for the RIP region industries from the mentor’s point of view.

**A.** Proposal of modifications for the mentoring program next version

(*) Souza (2014): more relevant competencies based on ABEPRO list (an input for this case study)
**Research Method**

- **4th PDCA cycle**: Focus on Mentoring 3rd version

P. Creation 2nd **standard version** mentoring program based on feedback previous cycle

- Identification **2 points of improvement** for mentee
- Definition of a **short project** for the mentee to practice the 2 points
- Definition by the mentor **how to check the results** of the program
- Practice between mentors and mentees in **3 meetings / 3 months**
- **Evaluation of 2 targets** and the results by the mentor at 3rd meeting
- **Presentation of the short project** at the end of the semester for professors
Research Method

• 4th PDCA cycle: Focus on Mentoring 3rd version

P. Creation standard **documentation to guide** mentors/mentees
D. **Follow up the program** in supervising internship classes **by professors**
C. Check: in the **last feedback questionnaire**, to check the program results
A. Make **last changes on standard** mentoring program for interns at industries
By a questionnaire formalized applied to mentors and mentees, the **program** is validated with **87% of efficiency** compared to the **initial targets** defined by them at the beginning of the program.

The **feedbacks** from mentors and mentees consider that the program is **valid for improving education** of industrial engineers students as future professionals.

Next steps are under development:
- **statistical validation** for questionnaires
- proposal to apply **other universities** in RIP region
References

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Thank you for your attention.

Your feedback is welcome!

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